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OF THE
SECRETARY OF COMMERCE
FOR THE FISCAL YEAR ENDED JUNE 30, 1924

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TWELFTH ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

1924

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[November 1, 1924]

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TWELFTH ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, November 1, 1924.

To the PRESIDENT:

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

I. Economic Progress.
II. Elimination of National Waste.
III. Legislative Recommendations.
IV. Condensed Bureau Reports.

Part I.—ECONOMIC PROGRESS

The outstanding features of the fiscal year were: First, the advance in agricultural prices, which had hitherto lagged behind industry since the slump of 1920; second, the beginnings of sound policies in German reparations leading to a hopeful measure of economic recovery in Europe; and third, the complete recovery of our own industry and commerce (aside from agriculture), great stability of prices, high production, full employment, expanding foreign trade and prosperity throughout the business world. There were some moderate decreases in activity of some lines during the latter part of the fiscal year, but since its close there has again been general recovery in those lines.

INDUSTRY

The general condition of manufactures, industry, and commerce as distinguished from agriculture is indicated by the following table:

TABLE I.—MAJOR ECONOMIC INDEXES

	Years ended June 30—		
	1922	1923	1924
BASED UPON CALENDAR YEAR 1919 AS 100			
Volume of business (quantities, not value):			
Manufacturing production	88	116	115
Mineral production	90	118	131
Forest products, production	101	111	117
Freight, railroad, ton-miles	89	109	110
Electric-power production	112	136	148
Building contracts let, square feet	92	107	109
Unfilled orders, United States Steel Corporation	77	113	77
Factory employment (1923=100)	87	96	95
Value of sales:			
Department stores	109	120	128
Five and ten cent stores	129	152	173
Mail-order houses	71	90	100
Wholesale trade	72	80	82
BASED UPON CALENDAR YEAR 1913 AS 100			
Wholesale prices:			
General average	142	156	150
Farm products	126	139	141
Food	139	142	143
Cloth and clothing	176	193	195
Fuel and lighting	196	220	175
Metal and metal products	115	138	141
Building materials	159	188	182
Chemicals and drugs	126	129	129
House-furnishing goods	178	181	178
Miscellaneous	118	122	116
Retail prices:			
Food	146	143	146
General cost of living[1]	171	169	171

[1] Quarterly average.

The slight slackening in production at the end of the year is indicated by the fact that the index for manufacturing output for June was 15 points below the fiscal year average, that for railway ton mileage 13 points below, for building contracts 6 points, and for employment in factories 7 points below. However, the sales of department stores, chain stores, and mail-order houses, the seasonal fluctuations of which make comparison from one month to another misleading, were larger in June than in the corresponding month of 1923. The subsequent recovery is shown by the September indexes, which for manufacturing production stood 13 points higher than in June, for mineral production 9 points, and for forest production 1 point higher. All these facts indicate that there had been but a very minor temporary recession in the spring. Of the most importance, however, the agricultural recovery by September had proceeded to a point where the wholesale price index of farm products was 143 on the 1913 base as compared to 149 for the price of all commodities, thus marking the reestablishment of the farmers' buying power at much more nearly the pre-war ratio.

AGRICULTURE

The outstanding event of the year was the improvement in agricultural prices. Unlike manufacturing and mineral industries, a change in the volume of agricultural production often does not reflect a parallel change in the well-being of the producers. Farm products in general have little elasticity of demand in the home market. The farmer can not adapt his output rapidly to changes in the foreign demand. The aggregate area planted to crops in this country has varied only slightly from year to year since the war and most of the individual crops show little change in acreage, although the low prices of wheat have resulted in a very considerable reduction in the planting of that cereal. The farmer, from the very nature of things, can not suddenly and greatly increase or reduce his aggregate plantings or the proportion of his land devoted to different crops. Industries and commerce more readily adapt themselves to change in demand. The variations in output of crops from year to year are usually due much more to weather conditions than to the will of the farmer. Therefore, farm prosperity can not be judged upon the criterion of production alone but requires consideration of prices as well.

The situation of agricultural prices may be well indicated by comparing September prices with the general level of commodity prices. Based upon 1913 as 100 the wholesale price index of all commodities was 149. The corresponding price index of No. 1 northern wheat was 148; of cotton (New York), 191; corn, 186; and hogs, 118.

From the low point since the beginning of 1921 these figures represent recoveries: For wheat, of 37 points; cotton, 99; corn, 111; and hogs, 37. Many readjustments are needed yet, but agriculture has turned an important corner and this change marks a vital step in the whole afterwar economic readjustment.

The increasing stability in agriculture is further marked by the fact that wholesale prices of food products show a continuing decrease in spread as compared to farm prices. This spread in the two indexes which amounted in certain months of 1921 to as much as 27 points has now (September, 1924) decreased to 5 points, indicating the steady elimination of speculation and closer trading margins through increasing economic stability and closer competition. The rise in agricultural prices, while in large part due to general world economic readjustment and to settlement of European economic conflicts, has been favored to some degree by local and special causes such as the decrease in corn crop and the fact that the abnormal world wheat crop of 1923 swung over to a slightly subnormal crop in 1924.

TRANSPORTATION

This fiscal year marks the first occasion since long before the war when our railway facilities have been completely equal to the demand of the country. There were no car shortages of any consequence. There was a speeding up of delivery of all goods. This complete reconstruction, expansion, and growing efficiency in transportation facilities marks a fine accomplishment on the part of our railway management. Its economic effect is most far-reaching. Every car shortage is a strangulation in the movement of commodities which reduces price levels to the producer and increases them to the consumer. It disarranges the synchronizing of our industrial fabric and widens the margin all along the line between producer and consumer. There is still requirement for extension of terminals and readjustment of rates. There are large consolidations needed for the ultimate best service and sound finance.

The making of our transportation facilities adequate to our needs is one of the greatest contributions toward our economic stability. The following table shows the essential items of progress in transportation as compared with the two previous fiscal years:

TABLE II.—RAILROAD OPERATIONS

	Year ended June 30—			Per cent change, 1923 to 1924
	1922	1923	1924	
Freight, ton mileage (millions)	351,536	431,035	436,737	+1.3
Average weekly car loadings	789,000	907,000	942,000	+3.8
Average daily car surplus	272,756	36,399	187,554	+415.2
Average daily car shortage	2,410	74,689	4,793	−93.6
Bad-order cars:				
Average for year	339,369	241,218	170,546	−29.3
Number at end of year	324,583	190,411	194,869	+2.3
Bad-order locomotives:				
Average for year	15,764	16,089	10,838	−32.6
Number at end of year	14,412	11,450	11,034	−3.6
Number of employees	1,643,000	1,770,000	1,850,000	+4.5
Total operating revenues (1,000 dollars)	5,508,169	6,104,274	6,120,646	+.3
Net operating income (1,000 dollars)	818,345	873,777	924,674	+5.8

	Calendar year		
	1921	1922	1923
Number of locomotives:			
Installed	1,330	1,379	4,037
Retired	1,130	1,682	3,746
In service end of year	64,949	64,512	64,896
Number of freight cars:			
Installed	63,406	77,221	197,875
Retired	69,245	126,472	[1] 200,000
In service end of year	2,344,787	2,322,286	2,376,373

[1] Approximate.

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

BANKING AND FINANCE

The following table indicates the movement in loans and discounts, investments, and deposits of all member banks of the Federal reserve system:

TABLE III.—FEDERAL RESERVE MEMBER BANK OPERATIONS

[In millions of dollars]

Date	Total loans and investments	Loans and discounts	Investments		Time deposits	Demand deposits
			United States securities	Other securities		
1923						
June 30	26,675	18,880	3,870	3,925	8,378	14,693
Sept. 14	26,498	18,857	3,723	3,918	8,466	14,566
Dec. 31	26,738	19,052	3,641	4,045	8,651	15,164
1924						
Mar. 31	26,833	19,176	3,570	4,087	8,890	14,719
June 30	27,262	19,264	3,608	4,390	9,204	15,309

The figures indicate a high degree of stability. The shift in investments is easily accounted for by the complete recovery in Government securities and their lower average yield as compared with other securities. The expansion in time and demand deposits at the end of the year parallels the slight slackening in production and especially the reduction of stocks of goods. The sharp reduction from $775,000,000 to $350,000,000 during the year in rediscounts at the Federal reserve banks is partly due to this accumulation of capital and partly to the continued import of gold. Rates on prime commercial paper declined from 5½ per cent in October, 1923, to 3¾ per cent in June, 1924. The yield on short-term Treasury obligations declined from 4¼ to about 2⅜ per cent, and Federal reserve discount rates in New York declined from 4½ to 3½. These changes during the year all reflected the abundance of loanable capital.

The total volume of money in circulation on July 1, 1924, was practically the same as one year before, but its component elements had changed markedly. Federal reserve notes and Federal reserve bank notes declined from $2,254,000,000 to $1,853,000,000, but the circulation of gold and gold certificates increased from $791,000,000 to $1,198,000,000. The increase in gold and gold certificates in circulation was almost equal to the net imports of gold from abroad, and was about $6,000,000 greater than the volume of Federal reserve notes and Federal reserve bank notes retired from circulation. This process makes for stability and minimizes dangers from inflation due to superabundant gold holdings.

One of the encouraging features of the exchange situation was the greater stability during the first half of 1924 in the values of the currencies of countries that have undertaken currency reforms. This was true not only of the rentenmark, the currency unit adopted in Germany after the collapse of the Reichsmark in the closing months of 1923, and of the chervonetz of Russia, but also of the currencies of Austria, Czechoslovakia, Poland, Finland, Esthonia, Latvia, and Lithuania.

The foreign capital issues (exclusive of refunding loans) brought out in the United States during the fiscal year aggregated about $450,000,000, a moderate increase over the preceding year. The new issues included $150,000,000 for the Government of Japan for purchase of supplies in the United States, $25,000,000 for the Dutch East Indies, $40,000,000 for the Netherlands, $50,000,000 for Switzerland, and $20,000,000 for Norway. In addition to these issues large amounts of short-term dollar credits were placed at the disposal of several European countries for the purpose of exchange stabilization.

DAWES PLAN

A most important event in the field of world finance was the formulation of the plan of the first committee of experts, commonly called the Dawes plan, which was finally ratified by the London conference on August 17, 1924. The plan provides that German financial and currency stabilization is to be brought about by an internationally controlled gold-reserve bank of issue. During the period necessary for economic rehabilitation, an international loan of about 800,000,000 gold marks is to be floated, proceeds of which are to be placed in this bank and to be used for rehabilitation purposes for the continuance of essential deliveries in kind, and certain prereparation costs. Reparations are to be paid during the interim period on an increasing scale, reaching a total annual figure of two and a half billions of gold marks in the fifth year, and may be increased thereafter by a prosperity index outlined by the committee.

These sums are to be raised from a Budget surplus, from interest on railroad bonds (the German Government railroads being turned over to a private company under international control), from the railroad transportation tax now in effect, and from interest and sinking-fund payments on industrial debentures. The latter are to be placed on German industry in order to equalize approximately the bonded indebtedness on these industries before the war, which is assumed to have been wiped out by postwar currency depreciation. The funds thus obtained on reparation account are to be deposited in the new bank of issue, and the responsibility for transferring these sums into foreign exchange for the benefit of the Allies rests with an international transfer committee, the chairman of which, called the agent for reparation payments, must effect these transfers without undermining German financial stability. Controls are established to insure the payment of the sums specified into the bank of issue. The plan offers within itself machinery for correction or alteration of details as difficulties arise in its execution.

European stabilization, which this plan may be expected to achieve, will bring about a revival in world trade and increased consumption of commodities, in which the United States is bound to have its share. This trade revival and increased consumption power should outweigh any increased competitive power which might be expected from the execution of the plan. It is not too much to say that this settlement of the vexed reparation problem, coming at the time it did, prevented another European collapse, with its inevitable repercussion on world trade and on the business of the United States. The Dawes plan is the first effort to solve the reparations question purely on a commercial and economic basis. The American members on the committee were assisted by a competent staff of technical experts, among them some of the officials of the Department of Commerce.

FOREIGN TRADE

In the fiscal year under review exports increased 9 per cent in value as compared with the preceding fiscal year, while imports decreased 6 per cent. The net result of these changes in opposite directions was an increase in the excess of exports over imports from $176,000,000 in 1922–23 to $757,000,000 in 1923–24. While in absolute amount this is a larger export balance than in any year prior to the war, the percentage by which exports exceed imports is somewhat smaller than in most pre-war years. The movement is shown in the following table:

TABLE IV.—FOREIGN TRADE OF THE UNITED STATES

[In millions of dollars]

	Years ended June 30—				Per cent change, 1924 from—	
	1910–1914	1922	1923	1924	1910–1914	1923
Actual values:						
Exports, merchandise	2,166	3,771	3,957	4,311	+99.1	+9.0
Imports, merchandise	1,689	2,608	3,781	3,554	+110.4	−6.0
Excess of exports (+) or of imports (−)—						
Merchandise	+477	+1,163	+176	+757	+58.7	+330.7
Gold and silver	+38	−449	−244	−388		
Merchandise, gold and silver combined	+515	+714	−68	+369		
Values at 1923 (calendar year) prices, eliminating effect of price changes (approximate):						
Exports, merchandise	3,729	4,139	3,955	4,271	+14.5	+8.0
Imports, merchandise	2,452	3,386	4,015	3,586	+46.2	−10.7
Excess of exports	+1,277	+753	−60	+685		

The picture of our foreign-trade balance sheet is, however, not at all complete without the inclusion of "invisible exchange," but as these figures are compiled upon the calendar year they can not well be included here.

The outstanding feature of our foreign trade in commodities is its strong, real growth since 1913. Our total imports and exports in that fiscal year amounted to $4,279,000,000 against $7,865,000,000 in 1923–24. If we correct this difference by the depreciated buying power of the dollar we still find an increase of 18.2 per cent.

This compares with decreases of 12 per cent for the United Kingdom, 14 per cent for France, and 51.4 per cent for Germany (in each case based on the calendar year 1923 in comparison with 1913, and with corrections for currency depreciation).

The gain in our total trade over the fiscal year 1913 is largely accounted for by the marked increases in our trade with Asia, Oceania,

and South America. The value of trade with Asia increased 244 per cent and that with Oceania and South America 192 and 95 per cent, respectively. Although the actual value of trade with Europe is greater than prior to the war the gain is less than the increase in prices and the actual quantity of goods is smaller. This decline in the relative importance of Europe as a factor in our trade as other areas gain is in part a continuation of a gradual shift in this direction evident before the war and in part the result of the war's serious impairment of European commercial strength.

I believe it can be said with confidence that the unique situation of our foreign trade is to a considerable degree due to the support given by Congress and the administration to the activities of this department. The reorganization of this service for practical trade promotive purposes is well indicated by the growth of applications by business houses and farm cooperatives for assistance by the department. In 1921 these inquiries averaged less than 700 daily, whereas they now exceed 7,500 daily and are heavily overtaxing the facilities of the organization. A recent query to export houses requesting estimates of their foreign transactions in which they were materially assisted by this department, either in sales promotion or in the prevention of losses, brought responses indicating a total exceeding $500,000,000.

Part II.—ELIMINATION OF NATIONAL WASTE

Outside of the very large functions of the department in the promotion of foreign trade, in aid to navigation, in provision of systematic economic information, and in cooperation with commerce and industry to advance productivity, a definite constructive national program has been developed for the elimination of waste in our economic system. The need is plain. The American standard of living is the product of high wages to producers and low prices to consumers. The road to national progress lies in increasing real wages through proportionately lower prices. The one and only way is to improve methods and processes and to eliminate waste. Just as 20 years ago we undertook nation-wide conservation of natural resources, so now we must undertake nation-wide elimination of waste. Regulation and laws are of but minor effect on these fundamental things. But by well-directed economic forces, by cooperation in the community we can not only maintain American standards of living—we can raise them.

We have the highest ingenuity and efficiency in the operation of our industry and commerce of any nation in the world. Yet our economic machine is far from perfect. Wastes are legion. There are wastes which arise from wide-spread unemployment during depressions, and from speculation and overproduction in booms; wastes attributable to labor turnover and the stress of labor conflicts; wastes due to intermittent and seasonal production, as in the coal and construction industries; vast wastes from strictures in commerce due to inadequate transportation, such as the lack of sufficient terminals; wastes caused by excessive variations in products; wastes in materials arising from lack of efficient processes; wastes by fire; and wastes in human life.

Against these and other wastes the department, acting always in cooperation with the industries themselves, has for the past three years developed an increasingly definite program. As these manifold activities of the department are based upon cooperation with industry and commerce, none of them leads to paternalistic ends. Many of the bureaus of the department have contributed to these activities, and the character of the work can be gleaned from the following short summary.

UNEMPLOYMENT AND THE BUSINESS CYCLE

The greatest waste is periodic slackening of production and resultant unemployment. At the beginning of this administration there were 4,500,000 unemployed. To meet this situation, and acting

under the direction of President Harding, I called in September, 1921, the First National Conference on Unemployment. This conference had as its primary purpose the promotion of temporary relief measures, but also had in view a broader consideration of the whole problem of business slumps. The relief measures adopted by the conference proved so successful that we overcame unemployment in much less time than in any other depression in our history. While formulating emergency measures, however, the responsible business men, labor leaders, and economists of the conference agreed fully with the proposal that exhaustive investigations should be made of the whole problem, with a view to the abiding minimization of this waste.

In pursuance of this objective I appointed a committee on business cycles and unemployment, which brought in its report in April, 1923. The committee found that slumps in business are due fundamentally to the economic collapse from the wastes, extravagance, speculation, inflation, overexpansion, and relaxation of effort by labor developed during booms. Remedies were proposed in three directions: First, the better control of credit by the Federal reserve system and the individual bankers, so as to prevent rank speculation and overexpansion; second, the provision of more adequate information as to the tendencies in production, stocks, consumption of commodities, employment, etc., so as to enable business generally to judge better of the approach of dangerous periods; and third, the deferment of as much as possible of public construction work during periods of full private demand in the industry to those periods when the construction industries were not so much in demand.

There is no doubt that the appearance of the report, sponsored by such eminent business men, labor leaders, economists, and engineers, did much to curb the beginnings of a dangerous boom in the spring of 1923. Moreover, the report has enlisted remarkable public attention both in the United States and abroad. It has stimulated economic thought and has developed some very tangible results in application of the principles laid down for mitigating the high losses to the community through the waste of booms and their inevitable collapse into gigantic unemployment.

One of the important recommendations of the committee, as stated above, was the necessity for improved statistical services by the Department of Commerce. It was considered that no other agency could adequately provide such a service. In consonance with this recommendation the monthly Survey of Current Business was inaugurated in 1921 with the aim of bringing all of this type of information together and publishing it promptly. The publication

has been steadily improved, until it now comprises 1,400 separate items collected from 55 Government departments, 116 voluntary agencies, and 35 technical and trade sources. Its paid subscription list has increased more than 50 per cent in the past year.

WASTES DUE TO SEASONAL CONSTRUCTION

A second committee was named by me from the unemployment conference on seasonal operation in the construction industries, which carried on extensive research into this problem and made its report last July, just after the close of the fiscal year now under review. The report showed conclusively that custom, not climate, is mainly responsible for the seasonal ups and downs in building, and that these evils are largely unnecessary and can be eliminated. For most types of construction it is now possible to build the year round in all parts of the United States. The elimination of these wastes would strengthen the entire business structure, for construction is the balance wheel of American industry. The value of yearly construction in the United States is more than $5,000,000,000. If building falls off, there is always a slackening in many other lines of industry, resulting in unemployment, decreased purchasing power of employees, and further depression.

Neither of the reports of these two committees included any recommendation as to extension of governmental activities further than that there should be strengthening of the economic and physical research now being carried on by the department. It was felt that a stimulation of thought and organization in the local communities was more consonant with our national conception of individual and community initiative. Important action has now been taken in many communities in changing leasing dates and other devices to induce more regularity to construction.

BITUMINOUS COAL INDUSTRY

Investigation made early in this administration, published in various departmental documents, revealed the high instability of the bituminous coal industry and the fact that it was functioning at great national loss. Committees of important men representing various phases of the problem were appointed and systematic cooperation has been set up in remedy. Due to the war and to periods of profiteering, far too many mines had been developed and placed in operation. Practically the whole of these mines had continued to operate on a basis of partial weekly employment. There were approximately 30 per cent too many mines engaged in the business and holding to themselves 30 per cent more labor than would be necessary to produce the nation's coal if they were continuously employed

One result of this intermittent employment is that a large proportion of the workers, although employed at a very high minimum daily wage, did not receive a sufficient annual employment to maintain a reasonable standard of living. Thus there grew out of this vicious cycle constant incitement to labor difficulties.

Investigation showed clearly that the primary remedies needed were (*a*) sufficient transportation facilities, because car shortages resulted in increase of prices, profiteering, and stimulus to the maintenance of high-cost mines; (*b*) the reduction of the seasonal character of the industry by the summer storage of coal by the larger commercial and industrial users; and (*c*) a period of industrial peace so that by avoiding strikes the subsequent profiteering would disappear and thus the fly-by-night and high-cost mines lose their support; in other words, the restoration of real competitive conditions. Through cooperation of trade associations of the principal industrial consumers, through chambers of commerce and public utilities a large amount of regular summer storage has been induced. Through the fine cooperation of the railways greater equipment and terminal facilities have been provided and car shortages have been largely eliminated. Through cooperation by the department with the unionized operators and with the leaders of the United Mine Workers a long term agreement has been entered upon, which insures industrial peace in the industry. These desired remedies have now in a great measure been attained. Here is a case where the saving of economic waste can be measured in the hundreds of millions of dollars.

It is true that during the past few months the industry has been somewhat demoralized by the large stocks of coal accumulated in anticipation of a possible strike last spring, and by the lessened demand during the summer. The broad result of gained stability, however, has been that the public has received its coal during the last fiscal year at the lowest price of any year since before the war. During the year under review prices averaged $2.23 per ton for run-of-mine coal at the mine. In 1920, chiefly because of car shortages, the price averaged $5.64. That was a year of wild speculation and profiteering, with no constructive effort by the Government to improve the position of the consumer. In the year 1922, before cooperation could effect a remedy, a strike of five months intervened, followed by a great car shortage. Nevertheless, owing to the restraint imposed on profiteering and to the cooperation of various industries in distribution, the average price for that year was $3.67.

The industry is now on the road to stabilization. The benefits lie not only in the provision of coal to the consumer at lower prices than have been attained at any time since the beginning of the

war. The gradual elimination of the high-cost and fly-by-night mines is bringing about a greater degree of concentration of labor upon a smaller number of mines, the increase of days of employment per annum, and thus a larger annual return to the workers. The inherent risks in the industry will be decreased because the efficient and stable operator will no longer be subjected to the type of competition that comes from those mines that exist only to take advantage of profiteering periods. No better example of cooperation to secure the elimination of national waste can be presented. The past year, as compared to the year 1920, shows a saving to the consumer of about $1,000,000,000, which must be reflected in decreasing costs of production in every avenue of industry and commerce.

INTERCONNECTION OF ELECTRIC POWER AND LIGHTING SYSTEMS

In October, 1923, with the approval of the President, I called a conference of the representatives of the State utility commissions of the 11 States from Maine to Maryland to consider what cooperative steps the Federal and State authorities could properly take to promote interconnection of power systems in those States. At this conference I outlined the problem in the following terms:

This conference is not conceived as more Government in business. The public authorities are already deeply in the power business through many forms of regulation and a very large measure of control of power sources. The thought here is that coordination between public authorities and industries may secure further consummation of a great advance in the development of a great service to the public.

The reason and need for this discussion are simply that engineering science has brought us to the threshhold of a new era in the development of electric power. This era promises great reductions in power cost and wide expansion of its use. Fundamentally, this new stage in progress is due to the perfection of high voltage, longer transmission, and more perfect mechanical development in generation of power. We can now undertake the cheaper sources of power from water sources further afield, such as the St. Lawrence, and cheaper generation from coal through larger and more favorably placed coal generation plants. We can secure great economies in distribution through the interconnection of load between systems, for thus we secure a reduction of the amount of reserve equipment, a better average load factor through pooling the effect of day and seasonal variations, together with wider diversification of use by increased industrial consumption. We can assure more security in the power supply from the effect of coal strikes and from transportation interruptions.

All this means the liquidity of power over whole groups of States. At once power distribution spreads across State lines and into diverse legal jurisdictions. We are, therefore, confronted not only with problems of the coordination in the industries of their engineering, financial, and ownership problems, but also with new legal problems in State rights and Federal relations to power distribution.

This superdevelopment of great areas of cheaper power has been dramatized by those less familiar with the problem as the construction of great power highways traversing several States into which we should pour great streams of high voltages from great giant water power or central steam stations to be distributed to the public utilities and other large users along the lines of these great power streams. This, indeed, serves perhaps to picture what is meant by superpower development. As a matter of practical fact, however, the natural development of this situation lies, first, in the interconnection of power supplies between the existing great utility systems, and second, in common action for the erection of large units of production at advantageous points for the mutual supply of two or more of the present systems, and in the development of such great water powers as the St. Lawrence. * * *"

The savings in these 11 States resulting from a coordinated and fully developed electrical power system, would, by the time it could be erected, amount to a conservation of about 50,000,000 tons of coal per annum; an annual saving could be made of over $500,000,000 per annum at an additional capital outlay of about $1,250,000,000. In this area we are to-day producing something like 9,000,000 horsepower by direct steam and individual plant generation, a substantial part of which could be transferred to central generation with great economy.

With the crowding of our population in large areas we are faced with most difficult questions in the development of terminal facilities, the handling of traffic on our railways. There has been some electrification of transportation. The engineers who have made systematic superpower surveys are convinced that over 40 per cent of the mileage of the railways in this territory could be electrified at substantial economies in operation and with enlarged service if we should secure this greater and more economical power development.

The indirect results both human and material are even more important than these figures I have given would imply. They take no account of vast losses to industry and commerce by the actual interruption and threatened interruption of fuel supplies to our several hundred thousand independent power units; no account of the relief to shippers from our already overburdened transportation and terminal facilities; no account of the increased production of our factories from cheaper power; no account of the larger extension of power into farm and home; no account of the reduction of physical labor and increase of comfort.

To secure the rapid adoption of these demonstratedly possible results is of profound public importance. Every time we cheapen power and centralize its production we create new uses and we add security to production; we also increase the production; we eliminate waste; we decrease the burden of physical effort upon men. In sum, we increase the standards of living and comfort of all our people.

This conference recommended the formation of the Northeastern Superpower Committee under my chairmanship. The members of the committee have been designated by the governors of the various States representing their utilities commissions, together with representatives of the War Department, the Federal Power Commission, the United States Geological Survey, and the Department of Commerce. An engineering subcommittee, comprised of engineers of the various State utilities commissions and Federal engineers, brought in its report on April 14, 1924. This report deals comprehensively

with the problems above outlined and with the major technical steps necessary to bring about the technical development required. Already a number of these steps have been undertaken by the various power systems throughout this area.

Studies as to the legal problems involved in interconnection over State lines, having in mind the involved and varying forms of regulation in different States, are being made by a legal subcommittee with a view to determining some basis of uniformity in such regulation.

It would be desirable to cover other areas of the country in the same fashion.

REVISION OF FEDERAL AND STATE PURCHASING SPECIFICATIONS

Being aware from war experience that the faultiness of specifications used in Federal purchases resulted in great waste of public funds, I undertook early in the administration that the Department of Commerce should review these specifications. A division in the Bureau of Standards was created to develop standard specifications, to test materials for the proper determination of the basis of such specifications, and to secure the cooperation of manufacturers skilled in production. Subsequently the cooperation of the Bureau of the Budget was enlisted in the establishment of an interdepartmental committee, now known as the Federal Specifications Board, for the better development of this work under the leadership of the Department of Commerce. The multitude of specifications is being taken in hand, and the chemical and physical requirements of each article in question are being exhaustively examined in the laboratories of the Bureau of Standards. Beyond this, however, after we have arrived at a definite scientific background, the manufacturers in each branch are being brought into consultation to make sure that the industrial and commercial setting of a given specification is right from the point of view of the practical producer. In this manner a complete revision of Government specifications is under way, 210 such standard specifications having been prepared up to the present time.

The evident savings in goods purchased for Federal use under the revised specifications were so great, both in price and quality, that in the spring of 1923, at the request of some of the State governors, I called a conference of all State purchasing agents in Washington. At this conference it was requested that the activities of the division of specifications should be extended to cooperate with the State authorities in the unification and preparation of specifications for the commodities purchased by local governments and public in-

stitutions. This undertaking is in active progress. In the development of cooperation with the various industries in this work, the request was made that the department should cooperate with the larger private purchasing concerns of the country in the preparation of standard purchasing specifications for themselves also. In many cases they are already adopting the specifications made for Federal purposes.

As an aid in this direction as well as in Government specifications, the division of specifications began in 1923 the preparation of a dictionary or handbook of standard specifications. In this book will be published references to all of the more important specifications in general use for the purchasing of supplies, including the standard Government specifications. In many cases committees are being called in representing the various phases of industry and commerce to determine better specifications for general use, methods of test to be applied under them, etc. The work has, by request, even been extended to the provision of better standard forms of construction contracts.

As an indication of the widespread effect that the establishment of a standard specification may have on the whole process of production, I may recite the following instance and many others could be quoted.

We had to consider the specifications for a wearing part in automobiles. The products of different manufacturers were secured and were placed under exhaustive chemical, physical, and actual operating study. It was found that under equal conditions this wearing part had from manufacturer A, for instance, a life of one year, from manufacturer B a life of two years, and from manufacturer C a life of three years, and so on, with all sorts of variations in between. In this case, we communicated the result of the investigation to the manufacturers not as to names but purely as to qualities disclosed and the physical characteristics which were developed as necessary. The result of the conference and study which grew out of this matter was that in the next offering of these parts none of them failed on the long-life test, and the improvements had been put into general production. A computation made by manufacturers shows that the benefit to the public automobile user through the longer life amounts to a saving of at least $15,000,000 a year, and it is entirely a saving of waste.

The work of this division under the Bureau of Standards will unquestionably save many millions of dollars to the taxpayer through better methods of buying and definite standards of quality throughout the Nation.

IMPROVEMENT IN TECHNICAL PROCESSES

As a result of the equipment built up during the war the Government possessed in the Bureau of Standards the greatest physics and research laboratory in the world. While the pre-war activities of the bureau were largely limited to the determination of physical standards and constants, it appeared to me that we should not lose in our industrial system the great values that could be obtained from the use of these laboratories in research into the elimination of waste in industrial processes where such research did not conflict with that normally 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.

The reports of the Bureau of Standards set out numbers of successful efforts of this character, resulting in the savings of enormous sums of money in the cost of production. Instances of such contributions to public interest may be enumerated in the successful development for methods of reducing the loss in the baking of Japan ware, in the installation of an optical-glass industry in the United States, in the progress made in the development of synthetic tanning material, in the development of use for cotton linters and other cotton wastes, and in the development of a method for reclamation of gasoline for the dry-cleaning industry. Many other activities of the Bureau of Standards result in savings of waste, such as the development of a standard test for determining the suitability of elevator interlocks which should reduce fatal elevator accidents; the substantial agreement reached on international temperature scales which will improve international industrial exchanges; the invention of instruments and methods for the determination of radiofrequency standards and measurements, etc.

SIMPLIFIED PRACTICE

A large field in the elimination of waste lies in the direction of simplified nomenclature, grades, and variations in dimensions of industrial products. The Division of Simplified Practice established early in 1921, serves as a centralizing agency in bringing together producers, distributors, and consumers, when so requested by any of these groups, for the purpose of assisting these interests in their mutual efforts to eliminate waste in production and distribution. Here the particular waste attacked was that caused by unnecessary diversifi-

cation of practice or character resulting in the accumulation of excessive and consequently expensive, stocks of seldom-used varieties. Soon after the division was established the national brick manufacturers brought to its attention the need for simplifying the number of sizes of paving bricks. It developed that no less than 66 sizes were actually being manufactured and sold. This department promptly called a conference of all interested parties, with the result that varieties of paving brick were reduced by mutual consent from 66 to 11. Since then there has been a further reduction to 5 varieties.

This is but a sample of the accomplishments of this division. During the year under review varieties of files and rasps were simplified from 1,351 to 498; range boilers from 130 to 13; woven-wire fencing from 552 to 69; fencing package sizes from 2,072 to 138; sizes of bed blankets from 78 to 12; hollow building tile from 36 to 19; roofing slate sizes from 60 to 30; blackboard slate sizes from 141 to 14; forged tools from 665 to 351, and so on. Working along somewhat similar lines, the National Screw Thread Commission tackled the problem of making bolts and nuts of any make fit together and eliminating unnecessary variations.

Two national conferences of lumber manufacturers, dealers, consumers, and architects have been held and successfully established standard nomenclature, grades, and sizes for softwood lumber calling for a 60 per cent elimination of the present variety in yard lumber. Similar effort is under way in hardwood. The application of simplified practice to automotive parts, gas water heaters, steam boiler parts and fittings, hacksaw blades, pocket knives, shotgun shells, drills, and nearly a hundred other commodities, is being developed by those engaged in their manufacture, sale, and use, with the cooperation of the department.

The department has received the widest approval from the leaders in the industries affected that the simplified practice work is steadily decreasing the volume of retail stocks, production costs, and selling expenses, at the same time strengthening employment by allowing manufacture of standard articles for stock. Estimated annual savings by the industries as a result of this method of national waste elimination range from half a million dollars in one commodity field to a quarter of a billion dollars in another. These savings eventually find their way back to the consumer either in lower prices or better quality or both. All such efforts definitely advance competition.

BETTER PRACTICE IN DISTRIBUTION

In an effort to realize balanced relationships between foreign and domestic markets and to extend to home industry services of the same general character now provided for the export trade, the de-

partment, operating under its first appropriation for this purpose, organized a division of domestic commerce in the Bureau of Foreign and Domestic Commerce. This division has commenced studies in plant location, the relative importance of regional sales territories, packing, warehousing, and cancellations. It has further made studies of the factors involved in marketing household appliances, paints and varnishes, sanitary ware, and other products.

A special activity of the department in the direction of elimination of distribution waste has been the exhaustive investigation made by the Bureau of Foreign and Domestic Commerce into the processes of marketing perishable produce.

The wastes of the present-day system may be summarized as follows:

1. The waste of an unnecessary number of purchase and sale transactions; that is, an unnecessary number of links in the distribution chain and an unnecessary number of different chains from the same center of production to the same center of consumption.

2. The waste in transportation of inferior and unsaleable products.

3. The waste in decay arising from delayed movements and repeated handling.

4. The waste from inadequate facilities for expeditious handling, both in transportation and at terminals, and the waste in unnecessary transportation through blind consignment and crosshauls in search of consumers.

5. The waste from uncontrolled distribution, by which local gluts and famines are created, with consequent destructive fluctuation in price levels and stimulation to speculation.

6. The waste from the destruction of agricultural capital itself through inadequate return by crowding the market in periods of slight overproduction.

7. The waste in cost of speculation and hazards in distribution produced by all of the above because either the producer or the consumer must pay through larger margins to cover such risks.

It has been the department's view that the best remedy for these evils lies in the extension of cooperative marketing and in the better organization of the distributors at the terminal markets. The department has already proposed a definite plan which I believe will mobilize economic forces to reduce these wastes with a minimum of governmental intervention.

REDUCING HOUSING COSTS

The high cost of housing construction brought to the front the necessity for the elimination of waste in that field as a contribution to lowering costs within the purchasing power of the community, and so maintaining activity. Aside from the work of the depart-

ment upon the simplification of building materials, the Division of Building and Housing was established to attack such problems as the development of uniform municipal building codes, the investigation of losses and wastes in financing home building, and the study of city and town zoning.

With the cooperation of a committee comprising representatives of the leading architects, municipal engineers, fire underwriters, and others, a standard municipal building code for small house construction has been prepared. Under similar auspices a recommended State and municipal plumbing code has also been completed. In the preparation of these codes exhaustive tests of materials were made at the Bureau of Standards, and the codes had the benefit of criticisms solicited from hundreds of sanitary engineers, architects, and public officials. Both codes have already been used by many municipalities, and the technical experts assume that the savings in construction costs will, in many localities, amount to as much as 10 to 20 per cent.

In the same fashion a standard State zoning enabling act was drafted under the auspices of this division, and has already been adopted by 13 States. The zoning of cities is a primary question in the elimination of waste. The constant, unnecessary rebuilding of different sections of towns and cities in their changes from residential to business or commercial purposes is to a very large degree an avoidable waste.

Cooperation is continuing with the industries and public officials in work on further sections of building codes, study of zoning, city planning problems, research on the use of building materials, and elimination of dimensional varieties.

BETTER HOMES

In addition to the large contribution to the problems of housing and construction through various sections of the department we have cooperated with voluntary agencies of the country on the broader problems of home ownership and home betterment. During the year the officials of the department joined with private endeavor to form "Better Homes in America" as an organization for education and public service, with headquarters in Washington. Its activities are under my direction as president, and its council embraces also some of our bureau chiefs. A small executive staff is supported by contributions from the public, and several hundred local committees serve voluntarily. The local committees exhibit demonstration houses, carry on educational work, and act in cooperation with schools and local organizations.

The results are to stimulate thrift for home ownership, encourage wise expenditure for household purposes, and promote local

solutions of housing difficulties. The new organization has been able to assist the small house service bureaus in supplying first-class house plans and in being of practical help to present and prospective home builders. Through this agency the fund of information obtained by Government departments as the result of years of experience and extensive research is carried without waste motion to the families in thousands of communities. More than 250,000 copies of the pamphlet prepared by the department on How to Own your Home have been sold. Numerous private organizations whose interests are related to housing assist in the enterprise.

STREET AND HIGHWAY SAFETY

The most challenging of all wastes is the waste of human life. There is no more conspicuous example of that wastage in our modern American life than in the mounting curve of traffic accidents. During the past year the department has taken the lead in an investigation of the tremendous human and physical losses due to accidents of this kind.

With a view to bringing about a better public understanding of the gravity of the situation, and if possible finding a remedy for it, I asked police officials, highway and motor vehicle commissioners, chambers of commerce, automobile associations and manufacturers, safety-first associations, engineering associations, insurance carriers, and labor organizations to join in the formation of a number of committees to investigate the whole subject. These committees are composed of representative men from all parts of the country. As soon as they have completed their work, it is proposed to call a national conference upon the subject. The gravity of the situation is well illustrated by the fact that even as I write the Committee on Statistics has brought in a report indicating that the deaths in 1923 were not less than 22,600, the number of people injured not less than 678,000, and the total economic loss not less than $600,000,000.

TRADE ASSOCIATIONS

One of the most important agencies through which the elimination of waste may be promoted is the trade association. It is true that a small minority of these associations have been in the past used as cloaks for restraint of trade by such activities as open-price associations and other attempts to control distribution or prices. It is equally true that the vast majority of trade associations have no such purpose and do no such things. The dividing line, however, between what activities are in the public interest and what are not in the public interest is not to-day clearly defined either by the law or by court decision. In consequence of recent decisions of the courts many associations are fearful of proceeding with work of vital

public importance, and we are losing the value of much admirable activity. At the same time we are keeping alive the possibility of wrongful acts. It is imperative that some definition should be made by which an assurance of legality in proper conduct can be had, and by which illegality or improper conduct may be more vigorously attacked.

In the elimination of waste, trade associations have been among the most constructive agencies of the country, and will be far more so if the solution can be found to the above question. Their waste elimination activities extend in many directions, of which the following are but a part:

Collection and distribution of statistics as to actual production, capacity production, stocks on hand, shipments, orders on hand, cancellations, number of employees, and such other data as will enable the industry and its consumers intelligently to judge future demands and supply.

Elimination of waste and reductions in cost of production and distribution by standardizing sizes and types, eliminating excess varieties, and establishing grades and qualities, thus reducing the amount of stocks thrust upon the retailer and at the same time enabling factories to operate more regularly to stocks of standard requirements.

Elimination of misdirected credit and aid in the collection of accounts.

Provision for the settlement of trade disputes by arbitration.

Stamping out of unfair practices and misrepresentation in business or as to goods.

Promotion of the welfare of employees, by the improvement of working conditions, sanitation, safety appliances, accident prevention, housing conditions, and matters of like character.

Economy in insurance by handling that of all members, including fire, industrial, indemnity, or group insurance.

Economies in transportation through common agencies for settlement of rate matters, classification, car supply, auditing transportation bills, and the study of competitive transportation agencies.

Elimination of waste in processes by the establishment of laboratories for technical and scientific research.

Instances of the injury incurred because of lack of such activities could be recited in great numbers. Gigantic loss to the public and to the rubber and fertilizer trades in 1921 was in large measure due to the absence of statistical knowledge of stocks of raw material which had been imported into the country at that time. The instability of the bituminous coal industry, and the constant disintegration of its employers' associations through fear of the restraint-of-

trade acts, contributed directly to their refusal to enter into negotiation with the unionized miners in 1922, and bears some share of responsibility for the long strike which then ensued.

Any collective activity can be used as a smoke screen to cover conspiracy against the public interest, but that is no reason for condemning all collective activities. Just because automobiles are sometimes used by bootleggers for the illegal transportation of liquor we do not prohibit their manufacture or their legitimate use. Probably the most compelling reason for maintaining proper trade associations lies in the fact that through them small business is given facilities more or less equivalent to those which big business can accumulate for itself.

Properly directed, this kind of activity is one of the strongest forces for the maintenance of competitive action. No one would advocate any amendment to the law that would sooner or later create monopoly, price fixing, domination or unfair practices, or any of the category of collective action detrimental to public interest. There is a vast difference between the whole social conception of capital combinations against public interest and cooperative organization profoundly in public interest. The former extinguishes individualism, legitimizes and fosters monopoly, dams up our economic channels, all of which penalize the consumer and make for less efficiency in production. The latter encourages individualism, fosters competition and initiative, resulting in efficient service and reasonable prices to the consumer.

Legislative definition of these matters has been given to the farmer and to labor, and I am convinced that the time has come when definition should be extended to those engaged in industry, trade, and commerce, particularly in the interest of maintaining the small business unit. The department has made definite proposals in this direction which it believes in no way open the door for illegal activities, and yet make ample provision for the maintenance of those activities which it is in the public interest to encourage.

OTHER ACTIVITIES

While elimination of waste has been the special theme of this report, I desire at this point to review briefly some of the special activities of the department in other directions.

ECONOMIES IN THE LIGHTHOUSE SERVICE

The department has been practicing what it preaches. The Bureau of Lighthouses, for instance, awake to the possibilities of waste elimination, has effected large economies by the installation of automatic apparatus. During the year under review 75 attended lights were changed to automatic, and 72 new automatic lights were estab-

lished. Nearly half of the coast and lake lights are now automatically operated, at greatly reduced costs. For example, 15 navigational lights in New York Bay were changed to automatic during the year, effecting an annual maintenance saving of $11,000.

CONSERVATION OF COASTAL FISHERIES

The conservation of our fisheries is a matter of the utmost national importance. Many of them are threatened with extinction. Our great runs of salmon on the Atlantic coast long ago disappeared as a food supply, and the salmon of the Pacific coast were doomed until we recently called a halt on their destruction. The sturgeon fisheries of the Great Lakes have declined 98 per cent in 40 years and the sturgeon has been almost displaced on the Atlantic coast. Since 1835 the annual catch of shad in the Potomac has dropped from 22,000,000 to 600,000. In 10 years the crab fisheries of the Chesapeake and Delaware have been cut in half. Our lobster catch is less than one-third of what it was 30 years ago.

In an address before the Sixth Annual Convention of the United States Fisheries Association at Atlantic City on September 5, 1924, I summarized the situation as follows:

THE WORK ACCOMPLISHED

First. Congress enacted last winter Federal legislation controlling oil pollution of coastal waters by oil-burning and oil-carrying ships. This measure was vital to the existence of our fisheries and the protection of our shellfish. It is only a beginning at solution of the pollution problem.

Second. We secured by negotiation with Canada the Pacific coast halibut treaty and the enactment of legislation under which the two nations are now able to halt the depletion and destruction of that great fishery and to start its recuperation.

Third. Congress, after three years of controversy, enacted the Alaska salmon fisheries conservation bill, and we have to-day vigorously stopped destruction and started the rejuvenation of these fisheries.

Fourth. Congress enacted the upper Mississippi fish and game refuge bill through which the streams of the upper Mississippi will be preserved for the breeding of fish and game.

Fifth. We have had some success in bringing about cooperation between different States for the protection of fisheries.

These steps have not been accomplished without bitter opposition, part of it venal, part of it innocent, but they have been supported by every true fisherman.

THE NEXT STEPS IN CONSERVATION

The steps now before us are still more important. They are:

1. To cultivate a sense of national responsibility toward the fisheries and their maintenance; to make conservation of those priceless resources a part of the national instinct; to let the whole country understand that we can no more overfish and expect to have seafood than we can outcut the growth of our forests and expect to have timber.

2. To make a vigorous attempt to restore the sturgeon, salmon, shad, lobster, crab, oyster, and clam and other littoral fisheries on the Atlantic coast.

3. To secure the prevention of pollution from sources other than ships both in coastal and inland waters.

4. To undertake the reinforcement of stocks of game fish throughout the United States.

FOREIGN RAW MATERIAL PROBLEMS

During recent years there has been increasing emphasis on the dependence of the United States upon raw materials not found within our own borders and subject to fluctuations in supply or price because of conditions over which the consumer in the United States has no control. This is especially the case in the operation of foreign monopolies. If our industries are to maintain an independent and progressive condition, they must be assured of a steady supply of raw materials at a reasonable price. The Sixty-seventh Congress recognized this situation and made an appropriation to enable this department to investigate the subject.

The work was begun in the spring of 1923 by the organization of units covering crude rubber, nitrogen, sisal, and tanning materials, as these seemed to offer the most pressing commercial problems. These investigations are either finished or well on the road to completion. Four parties were sent out to determine whether rubber could be successfully produced in competition with plantations of the Far East where the exports are under foreign monopoly control. These parties covered (1) India, Ceylon, British Malaya, and the Dutch East Indies; (2) the Central American States, Panama, the Atrato region of Colombia, and certain parts of the coastal region of Ecuador; (3) The Amazon Basin; and (4) the southern Philippines, British North Borneo, and Sarawak. Their reports are now in course of publication or preparation. It is planned to cover two other areas during the coming fiscal year: (1) Southern Mexico and Haiti, and (2) West Africa. The final result will give a clear indication as to whether rubber can be successfully produced nearer home and under American control.

The situation in regard to fertilizers essential to preservation of the soils of the United States has been gone into rather fully by the department. A thorough investigation of Chilean nitrate, the world's air nitrogen industry, and the nitrogen situation in various countries of Europe has been made and the results published or prepared. We are now engaged in an investigation of the potash situation and its effect upon American consumers. Similarly, we are reviewing the effect of the opening up of the phosphate deposits of North Africa.

The tanning industry of this country has had to face a number of very difficult problems, including that of the procurement of tanning materials from abroad. Detailed studies have been made by the department on wattle, chrome ore and chrome salts, quebracho, and tanning extracts. Samples of new tanning materials have been obtained from Mexico and Central America. Partly as a result of this emphasis upon the necessity for commercial independence in tanning materials, Congress has made an appropriation for a survey of the stands of chestnut timber and a study of chestnut blight. It is felt that a number of valuable results will follow from this beginning.

There are many other raw materials produced under foreign monopoly control which should be made the subject of scrutiny by this department. The appropriation of $100,000 allowed for prosecution of this work during the present fiscal year is scarcely sufficient to conclude work already begun on the commodities mentioned. However, there has been a start made on quinine, tin, mercury, coffee, minor fibers, and other commodities.

As a part of this general problem, I have made a recommendation that our consumers be allowed by legislative action to set up common purchasing agencies for imported raw materials where there is a positive combination in control of their sale. The dangers of such common purchasing agencies attempting to make improper prices against our buying public could be met by a provision to assure that all consumers who wished to participate could be allowed to act through such agencies, and by other necessary restrictions. I expect that this problem of maintenance of supplies of raw materials will become of ever-increasing importance to this country, and for that reason the department will give attention to all phases of the question.

RADIO

The department exercises its supervision over radio through the Bureau of Navigation. The past year has seen continued congestion in radio transmission. This has been true both in the marine and the broadcasting services, each having congestion within itself and each interfering with the other. It has become more and more difficult to furnish channels for existing services and for the new ones which desire to enter the field.

In order to deal with the situation understandingly and to obtain the continued cooperation of all concerned, I called a National Radio Conference to meet in Washington October 6, 1924, and invited the listening public as well as all other classes interested in radio to participate in it. The principal accomplishments of the

conference, which took place after the fiscal year now under review, were the allocation of additional channels for marine use, the limitation of marine radiotelegraphing so far as it has affected the broadcasting band, and the reallocation of channels for broadcasting stations. I am confident that these changes will result in a great improvement in the whole radio situation.

ST. LAWRENCE WATERWAY

Negotiations were initiated with Canada in 1922, at my request, looking toward joint reconsideration of the project to extend canalization and development of electrical power from Lake Erie to Montreal. Pursuant to these negotiations national commissions were created in both Canada and the United States, and a joint engineering board was appointed to review the estimates of cost and the broad engineering problems involved in the project. Under your appointment the American Commission comprises myself as chairman, together with 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, in addition to cooperating with the engineering staff, is engaged through the Department of Commerce in a critical economic study of the effects and benefits of this great project.

DEVELOPMENT OF COLORADO RIVER

The Colorado River Commission, comprising representatives of the seven States in the drainage of that stream together with myself as chairman, a year ago completed a compact between the States providing for the division of their various water rights. This compact is the first and necessary step in the development of this great natural resource, as the legal complications between the States have hitherto prevented systematic development. The compact has been ratified by six out of the seven States and now awaits the action of the State of Arizona. The Department of Commerce has continued its studies of the broad commercial problems involved in the development, particularly of the lower river, and in cooperation with other bureaus of the Government will be able to propose a plan for legislative authorization for such development to the forthcoming Congress.

THE RIO GRANDE

Interstate disputes as to water rights have held up the development of irrigation and power upon this great stream, although not to the same extent as in the case of the Colorado River. A commission is in course of appointment by the legislatures of the three States

of Texas, New Mexico, and Colorado, and the services of this department have been enlisted through my appointment as chairman of this commission, at the request of the governors and the President.

CONFERENCES WITH COMMERCE AND INDUSTRY

In connection with the services outlined in this report, and many others, a total of 155 conferences were held during the fiscal year by the Secretary and members of the department with committees of various branches of commerce and industry. Practically all were held at the request of these bodies. Of these conferences 8 were on matters of transportation and fuel distribution; 49 on questions of foreign trade and domestic commerce; 47 on specifications, standardization, and simplification; 12 on housing and construction; 10 on statistical questions; 13 on merchant marine and fisheries; and 16 on various general and special problems.

ADMINISTRATION

The close of the fiscal year was signalized by the introduction of the new personnel system, based on the classification act of 1923. So far as the salary scale is concerned, the net result of the change was an average per capita increase of $113. The total number of employees on the department's pay roll stood at 11,660 on June 30, 1924, as compared with 12,303 in 1923 and 12,683 in 1922. This actual reduction in personnel is the more notable because it was accomplished in the face of greatly expanded departmental activities. Nor have these larger services to the business community been rendered at any greatly increased net cost. Appropriations for the fiscal year ending June 30, 1924, amounted to $21,523,580.20 as compared with $21,585,044.75 for 1923 and $20,107,444.05 for 1922.

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 I submit the following recommendations, the adoption of which would greatly aid the department in its efforts to promote the country's commercial well-being:

REORGANIZATION OF THE DEPARTMENT OF COMMERCE

The investigations of the Joint Congressional Committee on Reorganization resulted in the inclusion in that committee's plan of many of the suggestions presented by me looking to a reorganization of the Department of Commerce which should enable it to function more effectively and economically. The department was created "to foster, promote, and develop the domestic and foreign commerce, mining, manufacture, shipping, and fishing industries, and the transportation facilities." Excluding all of the semijudicial functions in the Government respecting these matters, and excluding the Shipping Board, there are still a large number of functions of the kind set forth in the organic act which are administered outside the department. They lie in seven different departments and independent agencies of such widely divergent major purposes as the War and Navy. There is inevitable overlap, duplication, and lack of concentration of purpose. In the interest of economy, efficiency of administration, and better service to the public, all of the functions of the Government of the character enumerated in the organic act should be at once concentrated in three different groups—(*a*) industry, (*b*) trade, and (*c*) navigation. Each should be under an Assistant Secretary.

ADEQUATE BUILDING FOR DEPARTMENT

In order to provide space for the increased activities of the department it was necessary during the month of July to move the Bureau of Lighthouses out of the Commerce Building into separate quarters. The work of the department is now carried on in six different buildings widely separated and some of them unsanitary and dangerous to public records. This scattering of the services can only tend to impair the efficiency of the department and retard its work, but so long as the department is housed in rented quarters, inadequate to its needs, still further overflow from the main building

will be necessary. As has been emphasized for several years, the remedy lies in a Government-owned building of ample proportions to house under one roof the entire department, except the Bureau of Standards, which on account of the nature of its work is ideally situated away from the city proper.

The department is now entering upon the first year of a final five-year lease to the Commerce Building at an annual rental of $65,500, and the lessors have declined to grant a renewal beyond this limit at the present rate. In order that the department may not be without a home, steps should be taken immediately for the erection of a building of sufficient size to house its various bureaus and divisions, with due allowance for future growth. The present period of occupancy is too short to defer the project any longer, and good administration makes it imperative that immediate consideration be given the need of the department for a Government-owned building.

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 who are resident abroad, engaged in the expansion of commerce. While provision is made for deduction of foreign taxes, this has effect only in high taxation countries, and affords no adequate relief precisely in those areas where we need expansion in personnel most, as in Latin America and the Far East. All other high-tax countries have given complete relief in this particular, and thus our nationals are placed at great disadvantage in the countries mentioned above.

We shall have neither a staple export business 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 American 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 is applied by our country alone to earned incomes of our citizens abroad, tends to drive our citizens out of the front line of commerce in many countries. Legislation should be enacted to relieve our nationals from this burden. This suggestion is not intended to be applicable to 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 others.

FEES CHARGED FOR PASSPORTS

The regulations in effect at the present time, with regard to the fees charged for passports and visés, are irksome and provocative of resentment abroad, which 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.

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.

ADMEASUREMENT OF VESSELS

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. House bill 8915, introduced at the first session of the Sixty-eighth Congress, authorizes the foregoing transfer and its speedy enactment is urged.

LOAD-LINE LAW

It is imperative to the welfare of our merchant marine that legislation substantially similar to the laws of the European maritime powers on this subject be enacted, inasmuch as our cargo-carrying steamers are now allowed to clear from the ports of these foreign powers solely as an act of courtesy, and not as a matter of right. Senate bill 1319, introduced at the first session of the Sixty-eighth Congress, with the amendments suggested by this department, will provide adequate legislation on this subject. It is hoped that early action will be taken respecting this measure.

HOME PORT OF VESSELS

The Maritime Law Association and other maritime interests are deeply interested in determining the port where mortgages, bills of sale, hypothecations, and conveyances of vessels belonging to corpora-

tions are to be recorded. The present law on the subject is antiquated and confusing. It is essential to securing title to vessels, and validity of mortgages, that legislation on this subject be secured without unnecessary delay. A bill is now in course of preparation to accomplish this purpose.

LIABILITY OF OCEAN CARGO CARRIERS

The liability of ocean cargo carriers for loss of or damages to goods carried by them is at present inadequately defined. Bills of lading, the basic contracts of transportation, lack uniformity. Much needless and time-wasting litigation has resulted. Rules have been proposed to remedy the situation. When finally approved as equitable to the legitimate interests of carriers, underwriters, shippers of goods, and bankers, the four factors concerned in foreign shipments, these rules should be adopted as amendments to the Harter Act.

TRADE ZONES

Foreign trade zones in the ports of the United States have long been urged by trade and official bodies as a measure of benefit to American commerce, as they eliminate waste of time, labor, and money in the importation of raw materials which are to be reexported after manufacture in conjunction with domestic materials and of goods to be repacked or reshipped for distribution in foreign countries. Such zone areas would prove an excellent substitute for the inadequate system of bonded warehouses and drawbacks and afford much more economical handling. Their most important purpose would be in contribution to our merchant marine in increasing the volume of carriage in American bottoms. Senate bill 2570, introduced at the first session of the Sixty-eighth Congress, covers this subject, and it is hoped that it will be enacted into law in the near future.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

The following items of legislation are recommended for the Bureau of Foreign and Domestic Commerce:

1. Reclassification of the foreign service, providing that all representatives abroad above the grade of clerk be classed as commercial secretaries, be divided into classes according to salary, and be accredited by the Department of State in the same manner as are the commercial attachés at present. Senate bill 3384, introduced at the first session of the Sixty-eighth Congress, is designed to accomplish the foregoing purposes.

2. Legislation to simplify the handling of funds by the disbursing agents of the bureaus and as a result to simplify the whole process of accounting.

BUREAU OF THE CENSUS

1. It is recommended that the compilation and printing of the Official Register be discontinued. The Joint Committee on Printing ruled that the information compiled for 1923 should not be printed. The register calls for an outlay of about $50,000 per issue and serves no sufficient purpose to justify this expense.

2. 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.

3. 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.

4. That a travel allowance of $5 per diem, actual expenses, or $4 in lieu of subsistence, be allowed agents traveling on Government business.

STEAMBOAT INSPECTION SERVICE

The following items of legislation are recommended for the Steamboat Inspection Service:

1. 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. Senate bill 1666, introduced at the first session of the Sixty-eighth Congress, provides for the desired amendment.

2. That section 4426 of the Revised Statutes be amended so as to give the service the authority to require motor boats of over 15 gross tons to carry the same life-saving equipment as that required on steamers subject to inspection. Senate bill 3425 provides for this amendment.

3. 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. Senate bill 1718 provides for this desired amendment.

LIGHTHOUSE SERVICE

The following items of legislation are recommended for the Lighthouse Service:

1. Extension of the retirement law to cover (*a*) cases of disability in the field personnel of the Lighthouse Service and (*b*) retirement, in the discretion of the Secretary of Commerce, after 30 years of service.

2. 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.

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

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

5. Provision for the protection of aids to navigation damaged by passing vessels. House bill 6866, introduced at the first session of the Sixty-eighth Congress, covers the foregoing recommendations and its speedy enactment is urged.

AVIATION

In recent years the commercial use of air travel has increased to a considerable extent, though there is reason to fear that in this respect the United States is not keeping pace with some foreign countries. This method of transportation means much to our economic and social progress, and every encouragement, legislative and otherwise, should be given to its development. At the same time, there should be created a proper system for its regulation, having in view, primarily, the safety of life both of passengers and operators, and the orderly conduct of air navigation.

RADIO

Legislation was proposed at the last session of Congress to strengthen the authority of the Government over the channels of radiocommunication and to reinforce and extend the powers of the department. Development of the art is proceeding with such rapidity both on the scientific and industrial sides that each year sees a profound shift in its activities. Any legislation should be most carefully framed so as to allow complete flexibility in development and full application of all scientific and industrial advancement.

Yours faithfully,

HERBERT HOOVER,
Secretary of Commerce.

Part IV.—SPECIAL AND MORE DETAILED REPORTS OF THE DIFFERENT BUREAUS AND DIVISIONS OF THE DEPARTMENT AND SPECIAL RECOMMENDATIONS OF THEIR DIRECTORS

ADMINISTRATIVE DIVISIONS OF THE OFFICE OF THE SECRETARY

DEPARTMENT OF COMMERCE,
OFFICE OF THE CHIEF CLERK,
Washington, July 1, 1924.

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.

SUMMARY

The new personnel system, based on the classification act of 1923, went into effect July 1, 1924, and required considerable readjustment, which was effected with a minimum of delay. The net result on the department's salary scale was an average increase of $113. The total number of employees on the department's pay roll stood at 11,660 on June 30, 1924, as compared with 12,303 in 1923 and 12,683 in 1922.

Appropriations for the fiscal year ending June 30, 1924, amounted to $21,523,580.20 as compared with $21,585,044.75 for 1923 and $20,107,444.05 for 1922. The detail is given in the following table:

Appropriations for the Department of Commerce, 1921–1924

Bureau	1921	1922	1923	1924
Office of the Secretary	$314,550.00	$319,612.44	$344,259.62	$364,700.12
Bureau of the Census	5,000,002.00	1,000,001.95	1,737,680.00	1,732,340.00
Coast and Geodetic Survey	2,089,334.30	2,129,960.34	2,214,656.23	2,186,313.65
Bureau of Fisheries	1,231,238.20	1,246,721.51	1,402,180.82	1,230,137.81
Bureau of Foreign and Domestic Commerce	916,570.37	1,228,604.82	2,374,657.91	2,076,167.50
Bureau of Lighthouses	8,380,755.01	8,928,525.32	8,378,056.38	8,500,005.00
Bureau of Navigation	321,324.11	395,625.80	370,728.05	382,651.22
Bureau of Standards	1,351,670.72	1,494,192.31	1,548,476.27	1,731,538.25
Steamboat Inspection Service	1,001,007.87	990,834.45	906,200.47	900,770.65
Increase of compensation	2,522,820.32	2,048,365.11	1,844,399.00	1,958,956.00
Printing and binding	365,000.00	325,000.00	463,750.00	460,000.00
Total	23,494,272.90	20,107,444.05	21,585,044.75	21,523,580.20

NEED FOR A GOVERNMENT-OWNED BUILDING

In order to provide space for the increased activities of the department it was necessary during the month of July to move the Bureau of Lighthouses out of the Commerce Building into separate quarters. This scattering of the services can only tend to impair the efficiency of the department and retard its work, but so long as the department is housed in rented quarters, inadequate to its needs, still further overflow from the main building will be necessary. As has been emphasized for several years, the remedy lies in a Government-owned building of ample proportions to house under one roof the entire department except the Bureau of Standards, which, on account of the nature of its work, is ideally situated away from the city proper.

The department is now entering upon the first year of a final five-year lease to the Commerce Building at an annual rental of $65,500, and the lessors have declined to grant a renewal beyond this limit at the present rate. In order that the department may not be without a home, steps should immediately be taken for the erection of a building of sufficient size to house its various bureaus and divisions, with due allowance for future growth. The present period of occupancy is too short to longer defer the project, and good administration makes it imperative that immediate consideration be given the need of the department for a Government-owned building.

Since its occupancy of the Commerce Building, the Government has expended $709,280.11 in rent, including the water-cooling system, which costs $1,400 per annum, and at the expiration of the present lease the amount will total $1,043,780.11. If at the expiration of the present lease, June 30, 1929, it becomes necessary to occupy rented quarters, there is no hope of obtaining a suitable building at the present rental, which is one of the cheapest in the city. In the interest of economy, efficiency, and proper administration the wisdom of a permanent home for the department is so obvious as to need no argument.

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, 1924, 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, 1924, required by the act of Congress approved March 3, 1887 (24 Stat. 523); the 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 Washington to points outside of the District of Columbia during the fiscal year ended June 30, 1924, as required by the act of Congress approved May 22, 1908 (35 Stat. 244); the statement showing typewriters, adding machines, etc., exchanged by this department during the fiscal

year ended June 30, 1924, as required by section 5 of the act of March 4, 1915 (38 Stat. 1161); and the statement in connection with the payment of increased compensation to employees of this department during the first four months of the fiscal year ending June 30, 1925, as required by section 7 of the act of March 1, 1919 (40 Stat. 1268), will be transmitted to Congress in the usual form.

Table 1, page 45, 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, 1924.

Disbursement by the authorized disbursing officers of the department during the fiscal year ended June 30, 1924, arranged according to items of appropriation, are shown in Table 2, page 45.

Warrants drawn on the Treasurer of the United States to satisfy accounts settled by the General Accounting Office, State and Other Departments Division, during the fiscal year ended June 30, 1924, classified according to items of appropriation are shown in Table 3, page 51.

A statement of the expenditures during the fiscal year ended June 30, 1924, 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 55.

Miscellaneous receipts are shown in Table 5, page 55.

Unexpended balances of appropriations turned into the surplus fund June 30, 1924, are shown in Table 6, page 56.

A statement showing unused amounts of appropriations turned back into the Treasury during the last nine years is shown in Table 7, page 58.

APPOINTMENT DIVISION

The close of the fiscal year 1924 signalized the termination of a system of personnel organization under which, in preceding reports, positions had been classified as statutory, nonstatutory, etc., and on July 1, 1924, a modified and improved system under the classification act of 1923, as provided in the appropriation act for the fiscal year 1925, was instituted. In accordance with the system of monthly reports furnished by the administrative officers of the several units of the department, Table 8, page 58, shows the personnel as of record June 30, 1924, by bureau, class of service, and by sex.

The proceedings of the department in the matter of classification referred to in the last preceding report were followed up and perfected in anticipation of the provision by Congress for the necessary appropriation, and in spite of considerable delay resulting from proper action on appeals and the necessity of awaiting legal interpretations the organization was completed shortly after the commencement of the present fiscal year. The personnel was aligned by service (professional; subprofessional; clerical, administrative, and fiscal; and custodial), by grades in service, and salary adjustment made under the provisions of the classification and appropriation acts. The net result as of July 1, 1924, by bureau and service is indicated in Table 9, page 58.

One of the aims of classification is to provide for the readjustment of compensation which had been so urgently desired and agitated for many years. A partial remedy, which by reason of its

ultrasimplicity might be considered more or less inadequate, was provided in the additional compensation (bonus) legislation. In connection with the readjustment of salaries under reclassification the bonus was considered as part of the regular salary, and the net result of the readjustment showed an average increase of approximately $113 per capita. While such a readjustment is a welcome change from prior conditions, there are still inadequacies when we compare the salaries of the Government service with those offered by business organizations for comparable duties and qualifications and when we consider that the long-anticipated reduction in the cost of living does not materialize. A more flexible system of administration which would permit of equitable readjustments should be made possible. While to a limited degree classification meets this need, the restrictions of the appropriation act, which in practice probably have proved a greater handicap than was considered, prevent the utilization of the classification act to the extent intended and demanded by good business policy.

Although the turnover in the personnel by reason of the conditions indicated is not as great as in preceding years, it is still excessive to a degree which in business circles would not be permitted to exist. Table 10, page 59, indicates the changes involved in the administration of the personnel of the department during the fiscal year 1924.

The classification act provides that increases in compensation shall be allowed upon the attainment and maintenance of appropriate efficiency ratings, and devolves on the Personnel Classification Board the responsibility of establishing a system for this purpose. It is to be regretted that the pressure of business involved in the original classification prevented the board from functioning contemporaneously on efficiency ratings and reclassification. It is understood, however, that before the present fiscal year has far advanced it will be prepared to lay before the departments as the result of its study of the question rules under which efficiency ratings will be established before the end of the present calendar year. Classification and efficiency are so closely allied that an efficiency rating system is essential, and will result in the removal of considerable dissatisfaction which normally exists among the personnel of the service.

It is regrettable that the last session of Congress failed to enact a law liberalizing the provisions of the civil-service retirement system. The operation of this system has developed manifest weaknesses which legislation, having apparently the approval of Congress, was intended to modify. Retirement annuities should approximate some measure of provision for the maintenance of superannuated employees. Annuities ranging from a maximum of $720 to a mere pittance are a very inadequate reward for long and faithful service. To compel an employee irrespective of the length of his service to struggle along until he reaches a definite retirement age is discriminatory to the man who has devoted the prime of life to the service. If 30 years of faithful service does not entitle an employee to retirement on annuity, one is tempted to ask, "Why give it at all?" The fact that the cost of retirement is much less than was anticipated, and that the surplus in the fund (provided entirely by contributions of employees) will gain by salary increases under reclassification, should tend to remove any objections to liberalizing

the retirement system, which it is hoped will soon be taken up and favorably acted upon by Congress. During the fiscal year 1924, 49 employees of the department have been retired on annuities as follows: Under the civil service retirement law of May 22, 1920, 12, with average annuity of $491.33; under the lighthouse retirement law of June 20, 1918, 35, with average annuity of $714.92.

Table 11, page 60, shows the extent to which the leave privilege allowed by law was utilized by employees. This indicates that the total annual and sick leave utilized was 34.69 days. This is in excess of the preceding year, due to a slight increase in the amount of sick leave utilized, which is 0.05 greater than the preceding year. The average annual leave compares favorably with that of the preceding year. In this connection, in view of the administrative difficulties regarding the utilization of sick leave, I am of the opinion that an amendment of sick-leave regulations, reducing the period of annual leave with pay on account of sickness and making the same accumulative for an extended period of, say, five years, would provide a more equitable arrangement for the service and for the employees generally. Under such a policy, with a 12-day annual limit, it might be possible in a serious case of sickness to permit an employee who had not taken advantage of prior sick leave to use his accumulation in case of necessity. As this, however, is not now permissible under the restrictions of the act approved March 15, 1898, legislation would be necessary to accomplish such a plan.

DIVISION OF PUBLICATIONS

INCREASE IN PRINTING COSTS

An increase in the cost of printing and binding at the Government Printing Office became effective July 1, 1924, due to a revised scale of charges made necessary by an increase in wages for certain employments in that office. It is not possible at this time to determine the extent of the increase, as further wage adjustments are being considered. About 75 per cent of the department's appropriation is expended for publications, and labor constitutes the principal item of cost for this class of work. Consequently the ratio of increase in printing costs will be greater for the work of the Department of Commerce than for a department using a larger percentage of its total printing appropriations for work in connection with which labor costs do not predominate, such as blank books, forms, etc. As the increased rates apply to operations subsequent to June 30, 1924, on work ordered during the fiscal year 1924, it will be necessary in order to avoid a deficit in the appropriation for that year to cancel a certain amount of work or uncompleted jobs, having the operations accomplished at the time of cancellation charged against the 1924 appropriation, and issue requisitions as of 1925 for the completion of the work. This will result in a further obligation against the 1925 appropriation.

Table 12, page 61, shows expenditures during 1924 and allotments of the appropriation for 1925, by bureaus, offices, and services.

SALES OF DEPARTMENT'S PUBLICATIONS

During the year further restrictions were made in the free distribution of the department's publications, thereby causing the principal part of the distribution to be made on a sales basis by the Superintendent of Documents. Table 13, page 61, shows the distribution of the department's publications on a sales basis for the years 1921, 1922, and 1923. Figures for 1924 have not yet been compiled by the Superintendent of Documents. Coast pilots, inside-route pilots, tide tables, current tables, and charts are sold by the Coast and Geodetic Survey; other publications of the department are sold by the Superintendent of Documents at a price based upon the cost of reprinting from electrotype plates.

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, and standardization of methods of procedure and forms relative to purchases, sales, contracts, and property accountability during the fiscal year ended June 30, 1924.

PURCHASES

This office has, as during the fiscal year 1923, maintained during the current fiscal year 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 these proposals in obtaining clearance through the General Supply Committee and their return to the issuing office.

In cooperation with the Chief Coordinator's Office of the Bureau of the Budget this office has saved, by obtaining material desired by the different bureaus of the department, from surplus stocks of the other Government departments not desiring same, over $20,000.

The expenditures on the 10,302 purchase orders issued and the freight, travel, and miscellaneous accounts handled by this office amounted to $527,596.95.

Below is tabulation showing the increase and decrease in the requisitions, orders, etc., between the fiscal years 1923 and 1924, which is an indication of the variation of all branches of the division's work between the two years:

	1923	1924	Increase	Decrease
			Per cent	*Per cent*
Requisitions received	4,945	6,063	22.6	
Proposals for services, supplies, and equipment	1,479	1,904	28.7	
Invitations to bid on services, supplies, and equipment	6,127	7,379	20.4	
Orders issued	10,361	10,302		0.5
Vouchers passed for settlement	8,145	8,203	.7	
Letters emanating from this office	8,733	10,673	22.2	

The above work has necessitated 214 days 3 hours and 30 minutes of overtime labor by the employees of the division during the fiscal year 1924, as against 341 days' overtime during the fiscal year 1923,

the decrease being due principally to the increased efficiency of the office's regular employees and the addition to its force of two capable employees experienced in this line of work.

A material advance has been made in the efficiency of the stock, classification of expenditures, allotments, and financial records, due to the installation of a bookkeeping machine. Prior to the installation of this machine, these records were kept in the usual method of hand posting, which precluded a daily balance being obtained, and much difficulty was frequently experienced at the end of the month when an attempt at balancing all of those records was made. The present method enables this office to maintain a daily balance, which is not only more satisfactory, but which eliminates tedious and extensive checking at the end of the 30-day period, in order to reconcile discrepancies which invariably occur in records containing so many entries.

FEDERAL REAL ESTATE BOARD

The report of last year submitted by this office showed an increase during 1924 in rentals paid by this department for its field services of $8,865 over the rentals paid during the fiscal year 1923. During the fiscal year 1925 there will be a saving of $241, due to reduction of space and rentals over the fiscal year 1924.

CONTRACTS AND ADJUSTMENTS

The department's board of contracts and adjustments is now considering the tentative form of construction contract as drafted by the interdepartmental board of contracts and adjustments and has submitted its suggested changes to the supply contract as drafted by the last-mentioned board

TRAFFIC OFFICE

The traffic division, established under the office of the Secretary November 10, 1921, has again demonstrated its worth during the past year and the savings on freight and express shipments have more than justified its existence. A detailed statement covering shipments during the fiscal year 1924 is shown in Table 14, page 62.

DEPARTMENT LIBRARY

The department library of over 110,000 volumes contains a careful selection of books and pamphlets on commerce and economic conditions of every country in the world, and while it is primarily for the use of research workers of the department, its use by other branches of the Government and business men is steadily increasing.

The total accession of books and pamphlets for the year ended June 30, 1924, has been 5,770, including the volumes made by binding serials and periodicals; 3,128 books were catalogued, and 2,642 were added to serial cards; 12,490 cards of new accessories were added to the catalogue trays; 6,508 books were prepared for the shelf (stamped, labeled, pocketed, and book cards made); 4,662 books and periodicals were collated and prepared for the

bindery and 567 books were sent to the bindery; 1,692 books were discarded, thus making room for new material. Lists of bibliographies made numbered 290. Letters and post cards emanating from the library numbered 5,828.

The circulation of books in the Commerce Building, exclusive of use in the library, amounted to 15,346; 1,765 books were borrowed from the Library of Congress and other libraries; 1,745 trade, technical, and scientific periodicals, 100 daily papers, and 65 foreign official gazettes were currently received, recorded, and routed to 2,183 individuals or divisions.

Reference work is a strong feature of the departmental library. The inquiries cover a wide range of subjects, but use of the catalogue of about 700,000 cards and an efficient staff make the material readily available.

During the year a room on another floor was added and the older books transferred there, thus relieving the situation to some extent. Congestion still remains, however, one of the greatest problems.

WORK OF THE SOLICITOR'S OFFICE

During the fiscal year ended June 30, 1924, 131 contracts, totaling $1,108,364.04, together with 9 contracts of indeterminate amounts; 59 leases, amounting to $88,316.87; 28 revocable licenses, amounting to $17,171; 5 insurance policies, amounting to $282,000; 34 deeds, involving the sum of $163,474.35; 62 contract bonds, amounting to $228,295.60; and 88 official bonds, amounting to $476,000, were examined (approved, disapproved, drafted, redrafted, or modified).

The number of legal opinions rendered, formal and informal (memorandum), totaled 188 (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 79. Power-of-attorney cards, authorizing agents to execute official and contract bonds for surety companies, totaled 3,245. In addition, 10,567 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.

INCREASE OF WORK

Increased work throughout the department during the past year caused added demands upon the various divisions of the office of the Secretary. The personnel responded loyally, however, with the result that by much overtime work and to a large degree under intensive strain the work has been kept practically current. The employees have at all times been responsive to the demands upon them and cheerfully performed the tasks assigned. Several of the divisions are undermanned and are only able to carry on by help afforded through the medium of details from some of the bureaus. It is earnestly hoped that relief will be afforded in the near future by additions to the present personnel.

MISCELLANEOUS STATISTICS

TABLE 1.—*Total appropriations, 1924*

Bureau	Commerce and Labor act	State, Justice, Commerce and Labor act	Deficiency act	Transferred from other departments	Special act	Total
Office of the Secretary	$358,750.00				$5,950.12	$364,700.12
Bureau of Foreign and Domestic Commerce	2,076,110.00		$57.50	$152,723.17		2,228,890.67
Bureau of the Census	1,732,340.00					1,732,340.00
Steamboat Inspection Service	900,740.00		30.65			900,770.65
Bureau of Navigation	381,590.00				1,061.22	382,651.22
Bureau of Standards	1,642,360.00		89,178.25	134,775.00		1,866,313.25
Coast and Geodetic Survey	2,186,275.00		38.65	5,345.79		2,191,659.44
Bureau of Lighthouses	8,416,290.00		83,715.00	2,531.60		8,502,536.60
Bureau of Fisheries	1,112,590.00	$110,000.00	7,547.81			1,230,137.81
Printing and binding	460,000.00			1,500.00		461,500.00
Total	19,267,045.00	110,000.00	180,567.86	296,875.56	7,011.34	19,861,499.76
Increase of compensation					1,958,956.00	1,958,956.00
Grand total	19,267,045.00	110,000.00	180,567.86	296,875.56	1,965,967.34	21,820,455.76

Bureau	Transferred to other departments	Transferred to retirement	Total transferred	Net amount available for expenditures by this department
Office of the Secretary	$51,500.00	$3,661.00	$55,161.00	$309,539.12
Bureau of Foreign and Domestic Commerce	2,500.00	20,364.88	22,864.88	2,206,025.79
Bureau of the Census	5,000.00	23,484.50	28,484.50	1,703,855.50
Steamboat Inspection Service		17,531.00	17,531.00	883,239.65
Bureau of Navigation		6,364.50	6,364.50	376,286.72
Bureau of Standards	82,860.00	34,905.00	117,765.00	1,748,548.25
Coast and Geodetic Survey	42,824.50	10,093.50	52,918.00	2,138,741.44
Bureau of Lighthouses	57,548.00	9,830.11	67,378.11	8,435,158.49
Bureau of Fisheries	19,780.00	9,800.00	29,580.00	1,200,557.81
Printing and binding				461,500.00
Total	262,012.50	136,034.49	398,046.99	19,463,452.77
Increase of Compensation	20,208.00		20,208.00	1,938,748.00
Grand total	282,220.50	136,034.49	418,254.99	21,402,200.77

TABLE 2.—*Itemized disbursements, 1924*

BY DISBURSING CLERK, DEPARTMENT OF COMMERCE

Office of the Secretary:	
Contingent expenses, Department of Commerce, 1922	$248.96
Contingent expenses, Department of Commerce, 1923	39,324.84
Contingent expenses, Department of Commerce, 1924	158,324.93
Rent, Department of Commerce, 1923	6,083.34
Rent, Department of Commerce, 1924	56,758.32
Salaries, office of the Secretary, 1923	7,331.15
Salaries, office of the Secretary, 1924	156,138.70
Total	424,210.24
Bureau of Foreign and Domestic Commerce:	
Commercial attachés, 1923	5,107.27
Commercial attachés, 1924	12,494.22
Compiling foreign trade statistics, 1923	9,635.09
Compiling foreign trade statistics, 1923–24	154,506.41
Compiling foreign trade statistics, 1924	101,719.53
Directory of foreign buyers, 1924	8,511.91

Bureau of Foreign and Domestic Commerce—Continued.	
District and cooperative office service, 1924	$118,570.62
Enforcement of China trade act, 1923	2,588.97
Enforcement of China trade act, 1924	18,563.92
Export industries, 1923	19,434.33
Export industries, 1924	450,730.09
Investigating sources of crude rubber, 1923–24	188,066.73
Investigation of foreign trade restrictions, 1924	19,819.92
Promoting commerce, Department of Commerce, 1922	.66
Promoting commerce, Department of Commerce, 1923	18,404.31
Promoting commerce, Department of Commerce, 1924	45,720.88
Promoting commerce, Far East, 1923	7,310.56
Promoting commerce, Far East, 1924	70,326.90
Promoting commerce, South and Central America, 1923	5,146.32
Promoting commerce, South and Central America, 1924	59,263.08
Raw-material investigations, 1924	26,593.18
Salaries, Foreign and Domestic Commerce, 1923	9,258.93
Salaries, Foreign and Domestic Commerce, 1924	209,820.27
Transportation of families and effects of officers and employees, 1924	158.26
Total	1,561,752.36
Bureau of Standards:	
Advisory Committee for Aeronautics (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	25,781.26
Air Service, Army (War transfer to Bureau of Standards, act of May 21, 1920), 1924	5,483.14
Air Service, Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	10,524.36
Automatic rifles (War transfer), 1923–24	3,791.84
Automotive power plants, 1924	7,409.91
Aviation, Navy (Navy transfer, act of May 21, 1920), 1923	2,103.54
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 21, 1920), 1924	30,402.49
Aviation, Navy (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	3,520.97
Color standardization, 1923	1,251.24
Color standardization, 1924	8,435.99
Construction and repairs, Bureau of Construction and Repairs (Navy transfer), 1923	1,104.87
Engineering, Bureau of Engineering (Navy transfer to Bureau of Standards, act of May 21, 1920), 1923	492.00
Engineering, Bureau of Engineering (Navy transfer to Commerce, act of Jan. 5, 1923), 1924	517.84
Equipment, 1922	482.61
Equipment, 1923	36,716.16
Equipment, 1924	49,476.81
Experiments, Bureau of Ordnance (Navy transfer), 1923	1,037.63
Experiments, ordnance (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	4,723.10
Field artillery, armament (War transfer to Bureau of Standards, act of May 21, 1920), 1924	893.75
Gauge standardization, 1923	1,492.49
Gauge standardization, 1924	32,789.46
General expenses, 1922	305.14
General expenses, 1923	12,481.14
General expenses, 1924	25,176.33
High-temperature investigations, 1923	467.49
High-temperature investigations, 1924	8,283.74
Improvement and care of grounds, 1923	2,121.58
Improvement and care of grounds, 1924	8,715.34
Incidental expenses of the Army (War transfer to Commerce), 1923	10,725.73
Industrial research, 1922	90,432.99
Industrial research, 1923	33,641.37
Industrial research, 1924	131,788.91

Bureau of Standards—Continued.	
Investigation of clay products, 1923	$1,318.02
Investigation of clay products, 1924	25,734.37
Investigation of fire-resisting properties, 1923	2,491.04
Investigation of fire-resisting properties, 1924	23,147.23
Investigation of mine scales and cars, 1923	1,956.72
Investigation of mine scales and cars, 1924	8,393.75
Investigation of optical glass, 1922	786.55
Investigation of optical glass, 1923	1,899.13
Investigation of optical glass, 1924	23,088.31
Investigation of public-utility standards, 1922	88.00
Investigation of public-utility standards, 1923	7,677.14
Investigation of public-utility standards, 1924	79,323.55
Investigation of radioactive substances, 1923	1,703.80
Investigation of radioactive substances, 1924	7,972.50
Investigation of textiles, etc., 1923	1,821.41
Investigation of textiles, etc., 1924	20,134.69
Metallurgical research, 1923	6,025.78
Metallurgical research, 1924	35,440.51
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer), 1923	507.80
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Commerce, act of May 21, 1920), 1924	7,814.47
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	1,398.86
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	3,594.81
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1923	9,231.03
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1924	59.15
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	1,210.66
Radio research, 1923	2,429.60
Radio research, 1924	36,042.12
Replacement of altitude chambers, 1924	10,854.88
Rope investigation, 1924	13,960.39
Salaries, 1923	18,221.07
Salaries, 1924	361,378.93
Signal Service of the Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	438.63
Sound investigation, 1923	233.25
Sound investigation, 1924	4,895.44
Standardization of equipment, 1922	46.47
Standardization of equipment, 1923	8,349.89
Standardization of equipment, 1924	86,031.20
Standardizing mechanical appliances, 1923	889.99
Standardizing mechanical appliances, 1924	25,846.35
Standard materials, 1923	1,624.15
Standard materials, 1924	7,929.36
Subsistence of the Army (War transfer to Commerce), 1923	4,896.08
Sugar standardization, 1923	8,122.48
Sugar standardization, 1924	35,816.42
Tanks (War transfer to Bureau of Standards, act of May 21, 1920), 1923–24	1,548.10
Testing machines, 1923	2,324.24
Testing machines, 1924	31,131.55
Testing miscellaneous materials, 1923	2,582.77
Testing miscellaneous materials, 1924	36,833.97
Testing railroad scales, 1923	719.47
Testing railroad scales, 1924	31,513.61
Testing structural materials, 1922	491.84
Testing structural materials, 1923	12,415.52
Testing structural materials, 1924	176,510.77
Total	1,749,469.04

Steamboat Inspection Service:	
Clerk hire, 1923	$9,127.66
Clerk hire, 1924	101,045.00
Contingent expenses, 1922	27.73
Contingent expenses, 1923	16,543.27
Contingent expenses, 1924	86,772.52
Salaries, office of Supervising Inspector General, 1923	900.58
Salaries, office of Supervising Inspector General, 1924	20,984.63
Salaries, Steamboat Inspection Service, 1923	48,593.31
Salaries, Steamboat Inspection Service, 1924	535,710.01
Total	819,704.71
Bureau of Navigation:	
Admeasurement of vessels, 1923	98.26
Admeasurement of vessels, 1924	2,757.36
Clerk hire, shipping service, 1923	5,619.88
Clerk hire, shipping service, 1924	62,081.25
Contingent expenses, shipping service, 1923	1,802.80
Contingent expenses, shipping service, 1924	7,907.75
Enforcement of navigation laws, 1923	4,236.83
Enforcement of navigation laws, 1924	57,518.84
Enforcement of wireless communication laws, 1923	7,549.38
Enforcement of wireless communication laws, 1924	120,300.34
Preventing overcrowding of passenger vessels, 1923	865.07
Preventing overcrowding of passenger vessels, 1924	9,017.08
Salaries, Bureau of Navigation, 1923	1,696.81
Salaries, Bureau of Navigation, 1924	39,379.59
Salaries, shipping service, 1923	2,297.24
Salaries, shipping service, 1924	26,601.75
Total	349,730.23
Bureau of Fisheries:	
Fish hatchery, Duluth, Minn	2,099.55
Fish hatchery, Duluth, Minn., 1923	3,403.50
Fish hatchery, Gloucester, Mass., 1923	140.00
Fish hatchery, Wyoming	18.00
Fish-rescue station, Mississippi River, 1923	5.33
Fish-rescue station, Mississippi River, 1923–24	925.46
Investigating damages to fisheries	109.67
Marine biological station, Florida	166.27
Miscellaneous expenses, 1922	4,439.98
Miscellaneous expenses, 1923	47,601.48
Miscellaneous expenses, 1923–24	321.27
Miscellaneous expenses, 1924	413,422.42
Pay, officers and crew of vessels, Alaska fisheries service, 1923	666.33
Pay, officers and crew of vessels, Alaska fisheries service, 1924	10,116.84
Protecting seal and salmon fisheries, Alaska, 1922	8.82
Protecting seal and salmon fisheries, Alaska, 1923	4,013.75
Protecting seal and salmon fisheries, Alaska, 1923–24	10,873.95
Protecting seal and salmon fisheries, Alaska, 1924	15,096.75
Salaries, Bureau of Fisheries, 1923	29,196.47
Salaries, Bureau of Fisheries, 1924	391,609.51
Total	934,235.35
Bureau of the Census:	
Collecting statistics, 1923	102,833.56
Collecting statistics, 1924	765,647.91
Expenses of the Fourteenth Census, 1920–1922	123,241.57
Salaries, Bureau of the Census, 1923	32,120.39
Salaries, Bureau of the Census, 1924	736,393.79

Bureau of the Census—Continued.	
Tabulating machines, 1923	$5,718.55
Tabulating machines, 1924	32,151.69
Total	1,798,107.46
Bureau of Lighthouses:	
Aids to navigation, Delaware Bay entrance	9,229.47
Tender for third lighthouse district	79,374.94
Vessels for Lighthouse Service	276,186.34
General expenses, Lighthouse Service, 1922	1,071.24
General expenses, Lighthouse Service, 1923	5,905.37
General expenses, Lighthouse Service, 1924	28,615.08
Salaries, Bureau of Lighthouses, 1923	2,761.63
Salaries, Bureau of Lighthouses, 1924	60,131.13
Salaries, Lighthouse Service, 1923	297.42
Salaries, Lighthouse Service, 1924	7,744.47
Salaries, lighthouse vessels, 1923	677.70
Total	471,994.79
Miscellaneous:	
Increase of compensation, 1923	39,061.63
Increase of compensation, 1924	736,460.58
Printing and binding, Department of Commerce, 1923	106,179.34
Printing and binding, Department of Commerce, 1924	312,268.74
Total	1,193,970.29
Grand total	9,303,174.47

BY DISBURSING OFFICERS, LIGHTHOUSE SERVICE

Aids to navigation, Alaska	$52,623.31
Aids to navigation, Calumet Harbor, Ill	30,706.18
Aids to navigation, Chesapeake Bay, Md. and Va	5,160.57
Aids to navigation, Conneaut Harbor, Ohio	2,419.67
Aids to navigation, Coquille River, Oreg	1,152.44
Aids to navigation, Delaware Bay entrance	28,206.10
Aids to navigation, Florida coasts	32,637.87
Aids to navigation, Indiana Harbor, Ind	3,764.99
Aids to navigation, Lighthouse Service	96,677.65
Aids to navigation, Mississippi River, La	515.00
Aids to navigation, Pearl Harbor, Hawaii	504.03
Aids to navigation, Raritan Bay and connected water, N. Y. and N. J	10,683.49
Aids to navigation, St. Johns River, Fla	4,087.95
Aids to navigation, St. Marys River, Mich	46.75
Detroit Lighthouse Depot, Mich	5,939.57
San Juan Lighthouse Depot, P. R	10,506.93
Detroit River Lights, Mich	6,568.34
Diamond Shoal Light Vessel, N. C	1,350.00
Chicago Harbor Light Station, Ill	2,489.82
Galveston Jetty Light Station, Tex	172.00
Point Borinquen Light Station, P. R	13,436.43
Point Vincente Light Station, Calif	150.98
Sabine Pass Jetty Light Station, Tex	21,211.67
Sand Island Light Station, Ala	26,538.90
Spectacle Reef Light Station, Mich	3,028.29
Light-keepers' dwellings	5,501.95
Repairing and rebuilding aids to navigation, Atlantic coast	22,051.56
Repairing and rebuilding aids to navigation, Gulf of Mexico	10.00
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts	13,217.51
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922–23	16,653.58

Riprap protection for third lighthouse district	$7,352.99
Tender for third lighthouse district	7,043.34
Vessels for Lighthouse Service	20,708.47
General expenses, Lighthouse Service, 1922	22,447.75
General expenses, Lighthouse Service, 1923	518,187.70
General expenses, Lighthouse Service, 1924	3,463,292.56
Retired pay, Lighthouse Service, 1923	2,930.51
Retired pay, Lighthouse Service, 1924	93,776.76
Salaries, keepers of lighthouses, 1922	15.00
Salaries, keepers of lighthouses, 1923	37,903.32
Salaries, keepers of lighthouses, 1924	1,218,421.47
Salaries, Lighthouse Service, 1923	3,553.19
Salaries, Lighthouse Service, 1924	379,318.90
Salaries, lighthouse vessels, 1922	87.83
Salaries, lighthouse vessels, 1923	49,642.88
Salaries, lighthouse vessels, 1924	1,649,347.09
Increase of compensation, Department of Commerce, 1922	11.33
Increase of compensation, Department of Commerce, 1923	28,250.29
Increase of compensation, Department of Commerce, 1924	866,058.00
Total	8,786,362.91

BY SPECIAL DISBURSING AGENT, COAST AND GEODETIC SURVEY

Alterations to mine sweepers, Coast and Geodetic Survey, 1923	$2,611.57
General expenses, Coast and Geodetic Survey, 1922	25.47
General expenses, Coast and Geodetic Survey, 1923	33,609.13
General expenses, Coast and Geodetic Survey, 1924	70,053.98
Geological Survey (Interior transfer to Commerce), 1923	685.68
Maintenance, Bureau of Yards and Docks (Navy transfer to Commerce), 1924	181.37
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1923	42,071.45
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1924	367,085.42
Party expenses, Coast and Geodetic Survey, 1922	3,788.16
Party expenses, Coast and Geodetic Survey, 1923	138,255.75
Party expenses, Coast and Geodetic Survey, 1924	472,166.70
Party expenses, Coast and Geodetic Survey (Interior civil transfer), 1923	1,211.27
Pay, etc., officers and men, vessels, Coast and Geodetic Survey, 1922	43.50
Pay, etc., officers and men, vessels, Coast and Geodetic Survey, 1923	84,071.62
Pay, etc., officers and men, vessels, Coast and Geodetic Survey, 1924	406,539.23
Repairs of vessels, Coast Survey, 1923	16,329.64
Repairs of vessels, Coast Survey, 1924	52,648.22
Salaries, Coast and Geodetic Survey, 1923	121.89
Salaries, Coast and Geodetic Survey, 1924	275,945.08
Increase of compensation, Department of Commerce, 1923	15,914.42
Increase of compensation, Department of Commerce, 1924	145,625.42
Total	2,128,984.97

BY SPECIAL DISBURSING AGENTS, BUREAU OF STANDARDS

Equipment, 1923	$155.00
Standardization of equipment, 1923	155.00
Total	310.00

BY COMMERCIAL AGENTS OF THE DEPARTMENT INVESTIGATING TRADE CONDITIONS ABROAD

Commercial attachés, Department of Commerce, 1924	$163,806.25
Contingent expenses, Department of Commerce, 1924	200.23

Export industries, Department of Commerce, 1924	$2,740.04
Enforcement of China trade act, 1924	4,038.95
Investigating sources of crude rubber, 1923–24	89,104.03
Promoting commerce, Department of Commerce, 1924	263,201.73
Promoting commerce, Far East, 1924	92,410.88
Promoting commerce, South and Central America, 1924	109,981.48
Transportation of families and effects of officers and employees, 1924	6,801.94
Increase of compensation, Department of Commerce, 1924	8,638.33
Total	740,923.86

BY SPECIAL DISBURSING AGENTS, BUREAU OF FISHERIES

Miscellaneous expenses, Bureau of Fisheries, 1924	$12,747.66
Pay, officers and crew of vessels, Alaska fisheries service, 1924	18,366.17
Protecting seal and salmon fisheries of Alaska, 1924	31,971.22
Increase of compensation, Department of Commerce, 1924	3,203.33
Total	66,288.38

TABLE 3.—*Treasury warrants, 1924*

Office of the Secretary:	
Contingent expenses, Department of Commerce, 1922	$453.56
Contingent expenses, Department of Commerce, 1923	1,176.57
Contingent expenses, Department of Commerce, 1924	3,712.36
Total	5,342.49
Bureau of Foreign and Domestic Commerce:	
Commercial attachés, 1923	1,086.75
Commercial attachés, 1924	3,383.76
Compiling foreign-trade statistics, 1923	9.67
Compiling foreign-trade statistics, 1923–24	146.17
Compiling foreign-trade statistics, 1924	409.80
Directory of foreign buyers, 1924	45.22
District and cooperative office service, 1924	2,141.18
Enforcement of China trade act, 1923	21.91
Enforcement of China trade act, 1924	690.63
Export industries, 1923	3,394.19
Export industries, 1924	9,705.15
Investigating sources of crude rubber, 1923–24	17,951.09
Promoting commerce, Department of Commerce, 1922	6.08
Promoting commerce, Department of Commerce, 1923	3,597.57
Promoting commerce, Department of Commerce, 1924	7,186.63
Promoting commerce, Far East, 1923	1,431.78
Promoting commerce, Far East, 1924	5,423.10
Promoting commerce, South and Central America, 1923	304.69
Promoting commerce, South and Central America, 1924	3,001.99
Raw-material investigations, 1924	1,537.22
Transportation of families and effects of officers and employees, 1924	6,437.39
Certified claims—Promoting commerce, Far East, 1919	57.50
Total	67,969.47
Bureau of Standards:	
Advisory Committee for Aeronautics (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	451.71
Air Service, Army (War transfer to Bureau of Standards, act of May 21, 1920), 1924	82.55
Air Service, Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	196.88
Aviation, Navy (Navy transfer, act of May 21, 1920), 1923	60.78
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 21, 1920), 1924	581.45

Bureau of Standards—Continued.

Aviation, Navy (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	$1,242.63
Color standardization, 1923	30.53
Color standardization, 1924	268.70
Equipment, 1923	3,460.25
Equipment, 1924	1,067.50
Experiments, Bureau of Ordnance (Navy transfer), 1923	15.00
Experiments, Ordnance (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	18.22
Gauge standardization, 1923	142.36
Gauge standardization, 1924	269.75
General expenses, 1922	22.68
General expenses, 1923	2,432.21
General expenses, 1924	6,305.28
High-temperature investigations, 1923	59.49
High-temperature investigations, 1924	82.62
Incidental expenses of the Army (War transfer to Commerce), 1923	293.21
Industrial research, 1922	1,482.08
Industrial research, 1923	2,271.96
Industrial research, 1924	3,485.41
Investigation of clay products, 1923	218.53
Investigation of clay products, 1924	120.46
Investigation of fire-resisting properties, 1923	206.74
Investigation of fire-resisting properties, 1924	171.81
Investigation of mine scales and cars, 1923	365.48
Investigation of mine scales and cars, 1924	58.17
Investigation of optical glass, 1923	98.85
Investigation of optical glass, 1924	16.54
Investigation of public-utility standards, 1923	1,734.39
Investigation of public-utility standards, 1924	2,323.97
Investigation of radioactive substances, 1923	69.72
Investigation of radioactive substances, 1924	44.25
Investigation of textiles, etc., 1923	312.56
Investigation of textiles, etc., 1924	524.09
Metallurgical research, 1923	339.02
Metallurgical research, 1924	375.69
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Commerce, act of May 21, 1920), 1924	250.70
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	21.91
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1923	330.28
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	155.68
Radio research, 1923	42.00
Radio research, 1924	181.11
Replacement of altitude chambers, 1924	16.28
Rope investigation, 1924	49.78
Signal Service, Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	8.14
Sound investigation, 1923	1,142.29
Standardization of equipment, 1923	2,123.58
Standardization of equipment, 1924	5,228.97
Standardizing mechanical appliances, 1923	7.88
Standardizing mechanical appliances, 1924	191.47
Standard materials, 1924	26.29
Subsistence of the Army (War transfer to Commerce), 1923	113.31
Sugar standardization, 1923	60.79
Sugar standardization, 1924	123.33
Testing machines, 1923	199.77
Testing machines, 1924	239.76
Testing miscellaneous materials, 1923	349.63

Bureau of Standards—Continued.	
Testing miscellaneous materials, 1924	$93.54
Testing railroad scales, 1923	742.97
Testing railroad scales, 1924	3,638.49
Testing structural materials, 1923	2,899.76
Testing structural materials, 1924	6,068.10
Certified claims—	
Aviation, Navy (Navy transfer to Commerce, act of May 21, 1920), 1921	1,766.21
Gauge standardization, 1919	2.30
Industrial research, 1921	6,881.70
Military research, 1918–19	115.00
Total	64,374.54
Bureau of Navigation:	
Admeasurement of vessels, 1923	132.83
Admeasurement of vessels, 1924	302.18
Contingent expenses, shipping service, 1923	4.27
Contingent expenses, shipping service, 1924	21.79
Enforcement of navigation laws, 1923	206.50
Enforcement of navigation laws, 1924	595.69
Enforcement of wireless communication laws, 1922	15.98
Enforcement of wireless communication laws, 1923	2,461.71
Enforcement of wireless communication laws, 1924	5,166.23
Preventing overcrowding of passenger vessels, 1923	202.65
Preventing overcrowding of passenger vessels, 1924	744.22
Refunding moneys erroneously received and covered into the Treasury	733.56
Refunding penalties or charges erroneously exacted	318.73
Total	10,906.34
Steamboat Inspection Service:	
Contingent expenses, 1922	34.64
Contingent expenses, 1923	11,615.45
Contingent expenses, 1924	25,306.12
Certified claims—	
Contingent expenses, 1918	28.90
Contingent expenses, 1919	2.92
Contingent expenses, 1920	1.25
Total	36,989.28
Bureau of Fisheries:	
Fish hatchery, Duluth, Minn	24.77
Fish hatchery, Duluth, Minn., 1923	1,985.00
Fish-rescue station, Mississippi River, 1923	290.32
Fish-rescue station, Mississippi River, 1923–24	264.15
Investigating damages to fisheries	125.60
Marine biological station, Florida	130.08
Miscellaneous expenses, 1922	748.74
Miscellaneous expenses, 1923	21,811.57
Miscellaneous expenses, 1924	53,089.84
Protecting seal and salmon fisheries of Alaska, 1922	292.21
Protecting seal and salmon fisheries of Alaska, 1923	2,914.97
Protecting seal and salmon fisheries of Alaska, 1924	6,316.63
Certified claims—	
Miscellaneous expenses, 1918	5.60
Miscellaneous expenses, 1920	5.96
Miscellaneous expenses, 1921	33.45
Total	88,038.89

Bureau of the Census:	
Collecting statistics, 1923	$9,688.87
Collecting statistics, 1924	6,811.28
Expenses of the Fourteenth Census, 1920–1922	106.40
Tabulating machines, 1923	19.48
Tabulating machines, 1924	7.84
Total	16,633.87
Coast and Geodetic Survey:	
General expenses, 1924	10.72
Party expenses, 1923	878.83
Party expenses, 1924	6,897.12
Repairs of vessels, Coast Survey, 1924	18.58
Certified claims—	
General expenses, 1921	3.78
Party expenses, 1918	18.65
Total	7,827.68
Bureau of Lighthouses:	
Aids to navigation, Alaska	663.11
Aids to navigation, Chesapeake Bay, Md. and Va	11.13
Aids to navigation, Delaware Bay entrance	32,429.79
Aids to navigation, Florida coast	478.81
Aids to navigation, Conneaut Harbor	60.93
Aids to navigation, Pearl Harbor, Hawaii	259.58
Tender for third lighthouse district	241.94
Aids to navigation, St. Johns River, Fla	287.31
Aids to navigation, St. Marys River, Mich	3.06
Aids to navigation, Lighthouse Service	64.40
Detroit River Lights	259.34
San Juan Lighthouse Depot, P. R	9.06
Light-keeper's dwellings	7,500.00
Point Borinquen Light Station, P. R	46.14
Sabine Pass Jetty Light Station, Tex	162.16
Sand Island Light Station, Ala	5.04
Spectacle Reef Light Station, Mich	30.84
Light vessels for general service	2,803.00
Repairing and rebuilding aids to navigation, Atlantic coast	75.80
Repairing and rebuilding aids to navigation, Gulf of Mexico	59.79
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts	553.66
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922–23	62.40
Vessels for Lighthouse Service	75,471.66
General expenses, Lighthouse Service, 1922	5,561.74
General expenses, Lighthouse Service, 1923	31,457.26
General expenses, Lighthouse Service, 1924	52,641.69
Salaries, keepers of lighthouses, 1924	80.00
Salaries, lighthouse vessels, 1923	9.97
Salaries, lighthouse vessels, 1924	.95
Certified claims—	
General expenses, 1914	30.00
General expenses, 1915	28.66
General expenses, 1916	22.63
General expenses, 1917	20.78
General expenses, 1918	66.46
General expenses, 1919	24.50
General expenses, 1920	1,802.69
General expenses, 1921	1,667.40
Salaries, lighthouse vessels, 1918	2.25
Total	214,955.93

Miscellaneous:	
Increase of compensation, Department of Commerce, 1924	$20.00
Claims for damages, act of Dec. 28, 1922, Department of Commerce, Standards	294.25
Claims for damages, act June 5, 1920, Coast and Geodetic Survey	20.00
Claims for damages by collision with lighthouse vessels	1,522.00
Certified claims: Increase of compensation, Department of Commerce, 1918	.22
Total	1,856.47

TABLE 4.—*Expenditures, 1924*

Bureau	By disbursing clerk of the department	By special disbursing agents of department	By General Accounting Office	Total
Office of the Secretary	$473,794.44		$5,342.49	$479,136.93
Bureau of the Census	2,089,804.34		16,633.87	2,106,438.21
Coast and Geodetic Survey	26,047.70	$2,128,984.97	7,847.68	2,162,880.35
Bureau of Fisheries	1,046,453.70	66,288.38	88,038.89	1,200,780.97
Bureau of Foreign and Domestic Commerce	1,876,176.24	740,923.86	67,969.47	2,685,069.57
Bureau of Lighthouses	501,123.23	8,780,362.91	216,498.15	9,503,984.29
Bureau of Navigation	435,986.65		10,906.34	446,892.99
Bureau of Standards	1,941,681.68	310.00	64,668.79	2,006,660.47
Steamboat Inspection Service	912,106.49		36,989.28	949,095.77
Total	9,303,174.47	11,722,870.12	514,894.96	21,540,939.55

TABLE 5.—*Miscellaneous receipts, 1924*

Coast and Geodetic Survey: Sale of charts, publications, old property, etc	$50,609.07
Bureau of the Census:	
Sale of publications, etc	394.00
Reimbursement for loss of Government property	1.40
Bureau of Fisheries:	
Sale of 18,118 Alaska fur-seal skins	109,971.18
Sale of 55 Japanese fur-seal skins	941.08
Sale of 12 northwest coast fur-seal skins	43.83
Sale of 2 specimens of fur seals	2.00
Meals furnished employees at isolated stations	2,513.60
Sale of old property	2,859.16
Reimbursement for loss and damage to Government property	408.18
Bureau of Standards:	
Sale of old property, etc	210.65
Reimbursement for loss of Government property	4.00
Steamboat Inspection Service: Sale of old property, etc	70.17
Bureau of Lighthouses:	
Sale of old property, etc	153,414.05
Reimbursement for loss and damage to Government property	11,598.31
Sale of empty oil cans	1,317.65
Reimbursements by private concerns for work done	6,892.52
Rentals	3,967.42
Default in contracts	997.06
Sale of empty cement bags	22.20
Refund on account of unexpended mess funds	59.53
Bureau of Foreign and Domestic Commerce:	
Photostatic work done	5.16
Registration fees, etc., China trade act	700.00
Sale of old property, etc	164.29
Exchange on foreign money	1.85

Office of the Secretary:	
Sale of waste paper	$323.74
Part payment on account of liquidation of Swedish iron-ore contracts	5,950.12
Miscellaneous refunds	111.96
Bureau of Navigation:	
Tonnage duties	1,713,432.68
Navigation fees	212,825.46
Navigation fines	46,157.78
Sale of old property	2.00
Reimbursement for loss of Government property	12.00
Total	2,325,984.10

TABLE 6.—*Unexpended balances, 1924*

Salaries, office of the Secretary of Commerce, 1922	$3,717.35
Increase of compensation, Department of Commerce, 1920	.67
Increase of compensation, Department of Commerce, 1921	79.87
Increase of compensation, Department of Commerce, 1922	473.22
Rent, Department of Commerce, 1922	450.00
Contingent expenses, Department of Commerce, 1922	120.67
Expenses of the Fourteenth Census, 1920–1922	275,059.66
Salaries, Bureau of Foreign and Domestic Commerce, 1922	7,429.44
Export industries, Department of Commerce, 1922	525.36
Commercial attachés, Department of Commerce, 1917	35.28
Commercial attachés, Department of Commerce, 1918	9.00
Commercial attachés, Department of Commerce, 1919	86.70
Commercial attachés, Department of Commerce, 1920	1,297.92
Commercial attachés, Department of Commerce, 1921	267.62
Commercial attachés, Department of Commerce, 1922	2,887.36
Promoting commerce, Department of Commerce, 1918	1,093.41
Promoting commerce, Department of Commerce, 1919	810.28
Promoting commerce, Department of Commerce, 1920	84.78
Promoting commerce, Department of Commerce, 1921	699.05
Promoting commerce, Department of Commerce, 1922	6,669.65
Promoting commerce, South and Central Amercia, 1918	28.20
Promoting commerce, South and Central America, 1919	120.87
Promoting commerce, South and Central America, 1920	151.76
Promoting commerce, South and Central America, 1921	538.51
Promoting commerce, South and Central America, 1922	1,019.31
Promoting commerce in the Far East, 1919	.29
Promoting commerce in the Far East, 1920	129.89
Promoting commerce in the Far East, 1921	248.40
Promoting commerce in the Far East, 1922	564.95
Salaries, office of Supervising Inspector General, Steamboat Inspection Service, 1922	346.12
Salaries, Steamboat Inspection Service, 1922	89,749.41
Clerk hire, Steamboat Inspection Service, 1922	3,438.74
Contingent expenses, Steamboat Inspection Service, 1921	1.61
Contingent expenses, Steamboat Inspection Service, 1921–22	5,000.00
Contingent expenses, Steamboat Inspection Service, 1922	3,352.52
Salaries, Bureau of Navigation, 1922	2,131.89
Salaries, shipping service, 1922	8,577.60
Clerk hire, shipping service, 1922	3,735.75
Contingent expenses, shipping service, 1922	818.53
Admeasurement of vessels, 1922	9.52
Preventing overcrowding of passenger vessels, 1920	.90
Preventing overcrowding of passenger vessels, 1922	179.85
Enforcement of navigation laws, 1921	10.80
Enforcement of navigation laws, 1922	288.42
Enforcement of wireless communication laws, 1922	222.57
Salaries, Bureau of Standards, 1920	6.00
Salaries, Bureau of Standards, 1922	11,173.30
Equipment, Bureau of Standards, 1922	17,735.07
General expenses, Bureau of Standards, 1920	8.52
General expenses, Bureau of Standards, 1921	4.88

General expenses, Bureau of Standards, 1922	$10,287.39
Improvement and care of grounds, Bureau of Standards, 1922	309.76
Color standardization, Bureau of Standards, 1922	851.52
Equipping laboratory, Bureau of Standards, 1919–20	51.65
Gauge standardization, Bureau of Standards, 1917–18	1.05
Gauge standardization, Bureau of Standards, 1922	2,043.65
Investigation of clay products, Bureau of Standards, 1922	1,568.12
Investigation of fire-resisting properties, Bureau of Standards, 1922	1,917.50
High-temperature investigations, Bureau of Standards, 1922	548.25
Industrial research, Bureau of Standards, 1921	57.90
Industrial research, Bureau of Standards, 1922	29,566.84
Investigation of mine scales and cars, Bureau of Standards, 1922	1,616.70
Investigation of optical glass, Bureau of Standards, 1921	80.54
Investigation of optical glass, Bureau of Standards, 1922	1,371.06
Investigation of public-utility standards, Bureau of Standards, 1921–22	204.93
Investigation of public-utility standards, Bureau of Standards, 1922	706.56
Investigation of textiles, etc., Bureau of Standards, 1922	1,040.30
Metallurgical research, Bureau of Standards, 1922	2,512.09
Sound investigation, Bureau of Standards, 1922	170.69
Standardization of equipment, Bureau of Standards, 1922	11,427.49
Radio research, Bureau of Standards, 1922	1,792.81
Standardizing mechanical appliances, Bureau of Standards, 1920	1.54
Standardizing mechanical appliances, Bureau of Standards, 1922	1,262.93
Sugar standardization, Bureau of Standards, 1922	1,895.24
Testing machines, Bureau of Standards, 1922	1,870.84
Testing miscellaneous materials, Bureau of Standards, 1922	1,590.18
Testing railroad scales, etc., Bureau of Standards, 1922	2,912.86
Testing structural materials, Bureau of Standards, 1919	502.74
Testing structural materials, Bureau of Standards, 1922	20,295.94
Salaries, Coast and Geodetic Survey, 1922	5,043.21
Party expenses, Coast and Geodetic Survey, 1922	58,108.06
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1922	102,434.05
General expenses, Coast and Geodetic Survey, 1922	943.50
Pay, etc., of officers and men, vessels, Coast Survey, 1922	95,309.52
Repairs of vessels, Coast Survey, 1922	7,692.95
Salaries, Bureau of Lighthouses, 1922	685.49
Retired pay, Lighthouse Service, 1922	92.17
General expenses, Lighthouse Service, 1921	1,551.39
General expenses, Lighthouse Service, 1922	30,444.65
Salaries, keepers of lighthouses, 1922	5,796.30
Salaries, lighthouse vessels, 1922	108,614.90
Salaries, lighthouse service, 1922	2,796.95
Great Salt Pond Light Station, R. I	514.13
Fifth lighthouse district gas buoys	368.42
Diamond Shoal Light Vessel, N. C	14,481.99
Aids to navigation, Mississippi River, La	3.14
Southwest Pass Light Vessel, Mississippi River, La	518.39
Galveston Jetty Light Station, Tex	104.60
Aids to navigation, Fairport Harbor, Ohio	24.75
Chicago Harbor Light Station, Ill	51.80
Aids to navigation, St. Marys River, Mich	12.51
San Juan Lighthouse Depot, P. R	19.74
Salaries, Bureau of Fisheries, 1922	29,695.89
Advisory committee on fisheries, 1922	2,500.00
Miscellaneous expenses, Bureau of Fisheries, 1921	41.59
Miscellaneous expenses, Bureau of Fisheries, 1922	48,499.36
Pay, officers and crew of vessels, Alaska fisheries service, 1922	1,147.15
Protecting seal and salmon fisheries of Alaska, 1921	26.81
Protecting seal and salmon fisheries of Alaska, 1922	4,544.29
Total	1,071,918.24

Aviation, Navy (Navy transfer under fortifications act, May 21, 1920), 1921	$219.04
Experiments, Bureau of Ordnance (Navy transfer under fortifications act, May 21, 1920), 1921	101.33
Air Service, Army (War transfer under fortifications act, May 21, 1920), 1921	11.17
Gauge standardization, Bureau of Standards (War transfer under act May 21, 1920), 1922	257.06
Manufacture of arms (War transfer under fortifications act, May 21, 1920), 1921–22	75.23
Ordnance stores ammunition (War transfer under fortifications act, May 21, 1920), 1921–22	50.75
National security and defense, completing laboratory, 1919	40.15
National security and defense, industrial laboratory	99.36
National security and defense, commodity experts, 1919	63.25
Total	917.34
Grand total	1,072,835.58

TABLE 7.—*Summary of unexpended balances, 1916–1924*

June 30, 1916	$227,941.92	June 30, 1922	$546,440.71
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, 1920	1,149,363.28	Total	8,572,463.02
June 30, 1921	4,042,434.38		

TABLE 8.—*Personnel, 1924*

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	121				77	44	121
Bureau of the Census	711	742	92	223	1,271	497	1,768
Bureau of Foreign and Domestic Commerce	596	586	25		650	557	1,207
Bureau of Standards	754	30	8	9	709	92	801
Bureau of Fisheries	63	324	2	178	525	42	567
Bureau of Lighthouses	38	5,415		281	5,422	312	5,734
Coast and Geodetic Survey	314	518	19	31	850	32	882
Bureau of Navigation	40	174	1		176	39	215
Steamboat Inspection Service	15	347		3	313	52	365
Total	2,652	8,136	147	725	9,993	1,667	11,660

TABLE 9.—*Classification of personnel, July 1, 1924*

Bureau	Professional and scientific	Subprofessional	Clerical, administrative, and fiscal	Custodial	Total
Office of the Secretary	2	3	93	26	124
Bureau of the Census	5	2	667	46	720
Bureau of Foreign and Domestic Commerce	25	7	543	29	604
Bureau of Standards	316	236	140	63	755
Bureau of Fisheries	16	10	39	8	73
Bureau of Lighthouses	10	2	23	3	38
Coast and Geodetic Survey	71	61	42	17	191
Bureau of Navigation	4		42	2	48
Steamboat Inspection Service			13	1	14
Total	449	321	1,602	195	2,567
Percentage of total District of Columbia force	17.49	12.50	62.40	7.60	

TABLE 10.—*Changes in personnel, 1924*

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	42				1		2		45	
Bureau of the Census	55				68	111	573	750	696	861
Bureau of Foreign and Domestic Commerce	159	37	77	35	1		38	19	275	91
Bureau of Standards	125	3	4		8		71	4	208	7
Bureau of Fisheries	8	57		18	2	7	4	30	14	112
Bureau of Lighthouses	4	298		3				115	4	416
Coast and Geodetic Survey	8	39		5	3	53	19	1	30	98
Bureau of Navigation	1	21		6	1	9	8	12	10	48
Steamboat Inspection Service	9	17						5	9	22
Total	411	472	81	67	84	180	715	936	1,291	1,655
Grand total	883		148		264		1,651		2,946	

Bureau	Separations[2]									
	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	38						1		39	
Bureau of the Census	63				122	116	473	602	658	718
Bureau of Foreign and Domestic Commerce	82	21	26	136			49	21	157	178
Bureau of Standards	174	7			12		63	5	249	12
Bureau of Fisheries	9	43		8	1	5	2	39	12	95
Bureau of Lighthouses	2	323		2				99	2	424
Coast and Geodetic Survey	9	16		1		11	7	7	16	35
Bureau of Navigation	1	18		4		9	7	17	8	48
Steamboat Inspection Service	4	14						3	4	17
Total	382	442	26	151	135	141	602	793	1,145	1,527
Grand total	824		177		276		1,395		2,672	

[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.

[2] 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.

TABLE 10.—*Changes in personnel, 1924*—Continued

Bureau	Other changes						All changes		
	Promotions		Reductions		Miscellaneous changes [3]				
	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field	Grand total
Office of the Secretary	23	------	2	------	4	------	113	------	113
Bureau of the Census	81	------	------	------	50	------	1,485	1,579	3,064
Bureau of Foreign and Domestic Commerce	337	106	13	53	96	104	878	532	1,410
Bureau of Standards	393	4	2	2	28	10	880	35	915
Bureau of Fisheries	2	24	1	3	3	1	32	235	267
Bureau of Lighthouses	3	462	------	83	2	20	11	1,405	1,416
Coast and Geodetic Survey	15	28	2	2	7	4	70	167	237
Bureau of Navigation	2	9	------	------	6	18	26	123	149
Steamboat Inspection Service	3	11	------	------	------	2	16	52	68
Total	859	644	20	143	196	159	3,511	4,128	7,639

[3] Includes reappointments by reason of change of station, name, designation, extensions of temporary appointments, and temporary promotions and reductions.

TABLE 11.—*Leave of absence, 1924*

Bureau	Number	Total						Average for 1922
		Annual leave		Sick leave		Total leave		
		Days	Average	Days	Average	Days	Average	Days
Office of the Secretary	94	2,482	26.40	653	6.95	3,135	33.35	34.72
Bureau of the Census	686	20,187	29.43	6,297	7.72	25,484	37.15	35.91
Bureau of Foreign and Domestic Commerce	334	8,874	26.57	2,328	6.97	11,202	33.54	33.62
Bureau of Standards	686	18,885	27.53	3,814	5.56	22,699	33.09	31.87
Bureau of Fisheries	56	1,522	27.18	372	6.64	1,894	33.82	32.45
Bureau of Lighthouses	26	770	29.62	198	7.62	968	37.24	33.91
Coast and Geodetic Survey	185	5,256	28.41	1,146	6.20	6,402	34.61	34.85
Bureau of Navigation	28	784	28.00	136	4.86	920	32.86	32.91
Steamboat Inspection Service	11	316	28.73	40	3.64	356	32.36	33.18
Totals and averages	2,106	59,076	28.05	13,984	6.64	73,060	34.69	33.93

TABLE 12.—*Printing and binding*

Bureau, office, or service	Expenditures, 1924	Allotments, 1925
Office of the Secretary (Secretary, Assistant Secretary, solicitor, chief clerk, and division of publications)	$17,441.23	$19,000.00
Appointment division	720.61	900.00
Disbursing office	891.95	600.00
Division of supplies	1,298.02	1,500.00
Bureau of the Census	112,572.70	110,000.00
Coast and Geodetic Survey	38,359.91	37,000.00
Bureau of Fisheries	13,586.50	16,000.00
Bureau of Foreign and Domestic Commerce	177,940.97	175,000.00
Bureau of Lighthouses	15,830.62	15,000.00
Lighthouse Service	6,754.59	6,500.00
Bureau of Navigation	22,135.32	20,000.00
Shipping and Radio Services	8,719.42	8,000.00
Bureau of Standards	38,844.19	38,000.00
Office of the Supervising Inspector General, Steamboat Inspection Service	970.68	1,000.00
Steamboat Inspection Service	14,383.34	14,000.00
Customs Service	8,409.43	8,500.00
Reserve		4,000.00
Total	[1] 478,859.48	475,000.00
Appropriation	[2] 481,500.00	475,000.00

[1] Estimated (June 30, 1924); exact figures can not be stated until all work ordered in 1924 is completed and billed.

[2] Includes $1,500 transferred from the appropriation, "Printing and binding, Treasury Department, 1924," authorized by Public Act 379, consolidating the work of collecting, compiling, and publishing statistics of foreign commerce of the United States in the Department of Commerce, and $20,000 from the first deficiency act, fiscal year 1924, approved Apr. 2, 1924.

TABLE 13.—*Sales of publications*

Sales	Copies			Receipts		
	1921	1922	1923	1921	1922	1923
By Superintendent of Documents:						
Annual subscriptions	2,371,228	[1] 739,808	858,054	$17,934.40	$34,452.17	$37,950.00
Through miscellaneous sales	[2] 300,376	227,639	284,152	43,649.97	40,684.13	40,602.33
Total	2,671,604	[1] 967,447	1,142,206	61,584.37	75,136.30	78,552.33
By Coast and Geodetic Survey: Coast pilots, inside route pilots, tide tables, current tables, and charts				36,100.33	40,075.30	48,973.01
Grand total				97,684.70	115,211.60	127,525.34

[1] Beginning in September, 1921, Commerce Reports were published weekly instead of daily. This accounts for the decrease in the number of copies for 1922 as compared with the preceding year.

[2] Includes 120,000 copies of a series of small pamphlets known as Fisheries Economic Circulars, heretofore distributed free of charge.

TABLE 14.—*Department shipments, 1924*

NUMBER OF SHIPMENTS

Bureau	Less carloads	Carloads	Total	Total tonnage in pounds
Coast and Geodetic Survey	673	8	681	952,202
Chief clerk	1,247	11	1,258	823,956
Bureau of Lighthouses	5,153	206	5,358	15,457,954
Bureau of Fisheries	813	81	894	4,272,564
Steamboat Inspection Service	10		10	1,604
Bureau of Census	17		17	3,213
Bureau of Navigation	26		26	5,490
Bureau of Foreign and Domestic Commerce	63		63	18,520
Bureau of Standards	1,321	4	1,325	356,940
Total	9,323	310	9,632	21,899,443

DETAILS OF SHIPMENTS

Bureau	Weight in pounds			Number and method of movement				
				On bill of lading, freight and express	Not on bill of lading			
	Freight	Express	Parcel post		Freight	Express	Parcel post	Total
Coast and Geodetic Survey	910,775	47,402	1,025	631			50	50
Chief clerk	816,468	6,181	1,307	1,181	3		74	77
Bureau of Lighthouses	15,362,120	46,052	49,782	2,400	30	12	2,917	2,959
Bureau of Fisheries	4,189,325	83,039	200	832	12	39	11	62
Steamboat Inspection Service	1,585		19	8			2	2
Bureau of Census	2,695	518		13		4		4
Bureau of Navigation	4,241	1,249		26				
Bureau of Foreign and Domestic Commerce	16,478	2,042		63				
Bureau of Standards	311,305	42,619	3,016	748	12	39	526	577
Total	21,614,992	229,102	55,349	5,902	57	94	3,580	3,731

NOTE.—In addition there were handled, principally by the Bureau of Standards, 14,197 shipments, the charges on which were not paid by the department, total tonnage, 722,000 pounds; sleeping, parlor car, and steamship reservations, 1,504; routing orders obtained from Federal Traffic Board, 170; sets of proposals considered, 276; freight and express bills audited, 3,390; letters written, 3,744; tracers, freight, 63; claims, freight and express, 8; refunds, passenger, 127; passenger fares quoted, 1,878; itineraries furnished, 302 and freight and express rates quoted, 1,252.

Very truly yours,

E. W. LIBBEY,
Chief Clerk and Superintendent.

BUREAU OF THE CENSUS

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
Washington, July 1, 1924.

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

The United States census has grown from a decennial enumeration of the population, simple in character and scope, first made in 1790, to a large and complex group of statistical inquiries made at intervals varying in length from 1 month to 10 years and covering a wide range of subjects of importance and interest in the social, industrial, and fiscal fields.

The major inquiries may be listed as follows:

SOCIAL: Population—number, distribution, composition, and characteristics; occupations; the blind and the deaf; institutional population—dependent, defective, and delinquent classes; births; deaths; marriage and divorce; religious bodies.

INDUSTRIAL: Manufactures; agriculture; mines, quarries, and oil and gas wells; electrical industries—light and power stations, electric railways, telephones, and telegraphs; fisheries; transportation by water.

FISCAL: Wealth, public indebtedness, and taxation; financial statistics of States and cities.

In addition, numerous inquiries are made at annual, semiannual, quarterly, monthly, or other intervals, among which may be mentioned the following: Survey of Current Business; production, consumption, and stocks of cotton; number and activity of cotton spindles; cottonseed and cottonseed products; farm equipment; forest products; stocks of leaf tobacco; animal and vegetable fats and oils; wool consumption and stocks; activity of wool machinery.

Work on most of these inquiries and on various others of lesser importance, not specifically mentioned above, was in progress at some time during the year. Since the establishment of the Census Bureau as a permanent institution 22 years ago, its field of activity has been greatly enlarged, and in particular the publication, at frequent intervals, of up-to-date statistics having current rather than historical value has assumed greater and greater importance as a feature of the census work.

INSTITUTIONAL POPULATION

In my last report I referred to the increase in the number of persons committed to institutions for the mentally diseased, feeble-minded, epileptics, and juvenile delinquents; to almshouses, prisons, reformatories, jails, and workhouses; to institutions and societies for the care and protection of children; and to various other organizations of this character. The law establishing the Census Bureau as a permanent institution provides that in every tenth year an enumeration of the number and characteristics of the inmates of these institutions shall be made. The field work on the recent census, which covered the year 1922 for certain institutions and the early part of 1923 for others, was finished in 1923, and the preliminary reports were published during the fall of that year and the spring of 1924.

The schedules used and methods followed were determined upon after extended conferences with organizations and individuals engaged in this field of social research. The statistics already published and the more detailed analyses to follow in the final reports will afford more definite information concerning our institutional population than can be obtained from the reports of any preceding census, and it is hoped that they will direct attention to those elements of the population that are cared for at public expense and will point the way to important reforms that will not only reduce crime but also bring about more judicious management and a greater efficiency and economy in the care of the dependent classes.

Six reports are being prepared, namely, The Mentally Diseased in Institutions, Prisoners in Penal Institutions, Juvenile Delinquents in Institutions, Paupers in Almshouses, Inmates of Child-Caring Institutions, and Hospitals and Dispensaries.

The American Institute of Criminal Law and Criminology has recently prepared a report recommending that arrangements be made to collect and publish annually information concerning adult male criminals in reformatories, penitentiaries, and State prisons. The importance of publishing at regular intervals statistics concerning the inmates of penal institutions is self-evident. It would be a comparatively simple matter for the Federal and State penitentiaries and prisons to make regular annual reports, similar in form so as to be readily comparable, to the Bureau of the Census or some other Federal office. Such reports would be of great value in the study of the tremendously important problem of crime. I accordingly indorse the recommendation of the American Institute of Criminal Law and Criminology and express the hope that at no distant date arrangements may be made to carry it into effect.

It is very desirable and ought to be possible to obtain similar annual reports from hospitals for the insane, almshouses, and other institutions caring for defective, dependent, or delinquent classes, so that we might have a continuous and up-to-date record of the movement of population in these institutions, instead of obtaining statistical information only once in 10 years.

VITAL STATISTICS

BIRTHS AND DEATHS

One of the most important of the many statistical inquiries conducted by the Government is the Census Bureau's annual collection of data in regard to births and deaths. For deaths these data have been collected 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 38 States, the District of Columbia, the Territory of Hawaii, and 19 cities in nonregistration States, and the latter comprises 31 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 88 in 1924, and the corresponding proportion for the birth-registration area has increased from 31 per cent in 1915 to 75 in 1924.

The value of the published birth and death rates depends almost wholly, of course, on the accuracy and completeness of the basic data. It is highly important, therefore, that the States already in the registration areas be tested from time to time in order to determine whether they are maintaining their registration at a fairly close approximation to completeness, or at least within 90 per cent. During the past fiscal year such retests, with satisfactory results in each case, were made in Ohio, Wisconsin, Kansas, South Carolina, and Utah.

Attention may be directed to a new venture which bids fair to result in greatly improving birth registration, namely, the preparation of the mother's certificate, which is now being printed in attractive form by the bureau and is soon to be distributed in many of the States. This certificate notifies the mother of a newborn child that the birth record is preserved in the State registration office, gives the important items of record, and asks for corrections of errors. It is believed that mothers who have not received certificates will be likely to make inquiries of their physicians, and that these inquiries will in many cases lead to the registration of unrecorded births. This plan has been adopted in some States and cities where it has already proven highly successful, and there is reason to believe that its extension by the Bureau of the Census will have beneficial results in the promotion of registration.

MARRIAGE AND DIVORCE

The first Federal inquiry in regard to marriage and divorce covered the period from January 1, 1867, to December 31, 1886; the second, the period from January 1, 1887, to December 31, 1906; the third, the calendar year 1916; and beginning with 1922 the canvass has been made annually. The importance of this inquiry is indicated by the

increase in the divorce rate from 231 per 100,000 married population in 1906 to 281 in 1916, 330 in 1922, and 363 in 1923.

The data for 1923 in regard to marriages in 26 States and in regard to divorces in 11 States were obtained from State records. In the remaining States it was necessary to transcribe the information from county records, the work being done in most cases by county officials. At the close of the fiscal year most of the returns had been received and preliminary reports had been published for three States—Maine, Maryland, and New Hampshire.

ESTIMATES OF POPULATION

The practice of estimating the population for intercensal years was inaugurated in 1903, or practically as soon as the bureau was made a permanent office charged with the continuous collection of statistics. The necessity for estimates was apparent. The number of inhabitants, it has been truthfully said, is the dominant factor governing every statistical investigation into the conditions of national health, wealth, and well-being; and the statistical facts that may be compiled regarding social and economic conditions have little value unless they can be related to the number of persons concerned.

The question of how such estimates should be made was given careful consideration by a committee of statisticians, who reached the conclusion that the so-called arithmetical method gave results which on the whole were more nearly accurate than those arrived at by any other process. This method assumes that the annual numerical increase in the population of a given State or city is equal to the average annual increase during the interval between the last two censuses. Tests that were made indicated that in the majority of cases this assumption of a constant *amount* of increase gave results sufficiently accurate for statistical purposes and came nearer the truth than the alternative assumption of a constant *rate* of increase. But while this method of estimating, which was adopted in 1903 and has been followed ever since, seemed to be the best practicable one, its results have not always been satisfactory. In particular it fails when there are radical changes or abnormal conditions in population growth.

It is doubtful whether any method of estimating can be devised that will give good results in all cases. The question, however, is a very important one in relation to the work of this bureau; and sometime ago it was brought to the attention of the General Advisory Committee, which referred it to a subcommittee consisting of Walter F. Willcox, of Cornell University, and Robert E. Chaddock, of Columbia University. These gentlemen have now associated with them Willford I. King, of the National Bureau of Economic Research, New York, and Robert M. Woodbury, formerly of the Children's Bureau but now of the Institute of Economic Research, Washington. This committee is making a thorough study of the problem, and I am hopeful that a material improvement in our method of estimating population may be effected through its efforts.

ELECTRICAL INDUSTRIES

The census of electrical industries, covering central electric light and power stations, electric railways, telephones, and telegraphs,

has been taken quinquennially since 1902. The canvass for 1922 was commenced promptly with the beginning of the calendar year 1923—that is to say, immediately after the close of the year to which the data relate—and was practically finished by July 1, 1923. During the fiscal year 1924 the data were examined, analyzed, and tabulated, and the reports were prepared for publication. Three of the reports were sent to the printer before July 1, 1924, and the fourth—Central Electric Light and Power Stations—shortly after that date.

A significant fact brought out by the electrical-industries reports is that although substantial increases are shown for the telephone and telegraph industries and a very large increase for electric light and power plants, electric-railway traffic has been affected to so great an extent by the competition of the automobile and the motor bus that for the period from 1917 to 1922 the rate of increase in number of passengers carried was smaller than that in the urban population of the United States. Moreover, the mileage of track operated showed an actual decrease.

BIENNIAL CENSUS OF MANUFACTURES

CENSUS FOR 1921

Since 1850 a census of manufactures has been taken every tenth year as a part of the regular decennial census of the United States. The law establishing the Census Bureau as a permanent organization, enacted in 1902, provided for an additional series of manufactures censuses, to be taken midway between the decennial censuses, in the year 1905 and every tenth year thereafter. The census of manufactures thereby became quinquennial. The act of March 3, 1919, relating to the Fourteenth Decennial Census of the United States, provided for the collection of statistics of the products of manufacturing industries for 1921 and every second year thereafter, thus establishing a biennial census.

The first biennial census of manufactures covered the year 1921, and the bureau made a record for promptness in publishing its results. For the first time in the history of census taking, summary statistics for most of the manufacturing industries were made available to the public in less than a year from the completion of the canvass. A preliminary report covering all industries, classified according to 14 major groups, was given out July 23, 1923.

Following the publication of these preliminary summaries, the bureau issued 56 complete and detailed printed reports, in the form of separate bulletins, covering, in all, 140 of the more important manufacturing industries. All these separate reports, together with additional statistical matter, have been assembled into a single octavo volume of 1,637 pages, the copy for which was sent to the printer October 23, 1923, only a little more than a year after the completion of the field work.

CENSUS FOR 1923

PREPARATORY WORK.—With the experience gained at the first biennial census, and with more time at our disposal in preparing for the second, it was possible to make a number of improvements

in methods and practice. The first step was to redraft the schedules for certain industries. With this end in view, conferences were held with manufacturers' organizations and individuals interested in various industries. It was found that these organizations and individuals desired especially to procure more detailed statistics concerning kinds, quantities, and values of products, and it required 71 different forms of schedules, a larger number than had been employed except for 1919, to provide for the collection of the data necessary for the compilation of such statistics.

An industrial census can not be taken successfully unless the bureau has the hearty cooperation of the manufacturers. The value of the statistics is quite generally acknowledged, but there are a few manufacturers who, while admitting the usefulness of the statistics, refuse to supply data in regard to their own operations. Their attitude is similar to that of a large producer who stated that he wanted to see the figures for the total production of all other establishments in his line but would not furnish any for his own operations. This attitude if carried to its logical conclusion would result in the destruction of the whole scheme of collecting industrial statistics.

As a result of the bureau's efforts, the manufacturers who have been called upon to supply the data at this census have, as a rule, cooperated more readily and willingly than at any preceding census. In fact, the promptness with which most of the manufacturers have sent in their reports is one of the outstanding features of this census in contrast with preceding ones. Much of this cooperation may be traced to the bureau's campaign to bring about a better understanding of the uses and value of industrial statistics.

Field Work.—At the censuses for 1919 and 1921, 63 and 58 per cent, respectively, of the returns were collected in person by special agents and the remainder by correspondence. The canvass by special agents is expensive, however; and, since the bureau's funds available for carrying on the field work for 1923 were considerably less than the expenditures for previous years, it was necessary to devise new plans for doing the work, and especially to arrange for the collection of a much larger proportion of the returns by mail.

With this end in view, correspondence was begun in October, 1923, with a large number of trade organizations, chambers of commerce, and trade publications for the purpose of obtaining their cooperation in perfecting the bureau's lists of establishments and in making the canvass. As a result of these efforts on the part of the bureau and of the trade organizations, reports from approximately 115,000 manufacturers, or about half the total, had been received by March 1, after the lapse of only two months from the beginning of the canvass. Arrangements were then made with 196 chambers of commerce throughout the United States to render assistance in obtaining the reports from the dilatory manufacturers.

The assistance rendered by the trade associations and chambers of commerce has enabled the bureau to make a substantial saving in the cost of the field work as compared with that on previous similar censuses. The beneficial results of the cooperation, however, do not appear wholly in the saving in cost, as it has made possible the completion of the canvass at a much earlier date than ever before, and

therefore has brought about a saving of several months in the compilation of the statistics.

ANNUAL STATISTICS OF MANUFACTURES

In the case of four of the industries covered by the biennial census of manufactures, there has been a demand for detailed statistics of production at more frequent intervals, and accordingly the bureau is compiling and publishing annual reports for these industries, namely, Forest Products, Farm Equipment, Clay and Other Refractory Products, and Lighting Equipment. These annual reports present detailed statistics as to quantities and values of products, comparable with those given in the biennial census report, but do not include "general statistics" as to number of wage earners and other employees, salaries and wages, cost of materials, etc.

CURRENT INDUSTRIAL AND BUSINESS STATISTICS

The Census Bureau's current work has been materially increased during recent years and has now assumed extensive proportions. (The term "current work" is here used to signify the collection, compilation, and publication of statistics at monthly, or in a few cases quarterly or semiannual, intervals.) This work may be broadly classed under two heads, namely, Survey of Current Business and semiannual, quarterly, and monthly census inquiries. The former refers to a monthly publication presenting summary statistics and index figures for a large number of important industries. The latter covers a group of inquiries made by the Bureau of the Census, in most cases at monthly intervals, the results of which are published separately.

SURVEY OF CURRENT BUSINESS

The Survey of Current Business is a monthly publication, of quarto size, containing more than 1,000 industrial and business indexes in the form of tables showing monthly production, shipments, stocks, receipts, imports, exports, new orders, unfilled orders, etc., for important classes of products of manufacture, mining, and agriculture. For February, May, August, and November considerably more detailed and comprehensive editions are issued than for the other months of the year. The remaining eight monthly issues contain the principal comparisons and relative numbers for the current and preceding months. The figures by months as given in the four enlarged issues cover the current and two or three preceding years, and monthly averages are shown for a larger number of years, extending in many cases as far back as 1913. Both absolute figures and relative numbers are presented. The four detailed editions contain approximately 225 pages each, and the remaining eight, about 65 pages.

The data are supplied in some cases directly by the individual establishments to the bureau, and in other cases by trade associations and similar organizations, technical periodicals, and reports of the Federal Government, of State and city governments, and foreign

governments. Each issue of the Survey is published about three weeks after the close of the latest month to which it relates, and in addition advance statements are distributed to subscribers nearly every week.

The paid subscription list of the Survey increased from 5,435 names in June, 1923, to 8,492 in June, 1924. The increase of over 3,000 subscribers during the fiscal year was considerably more than twice as large as the increase during the previous year. The total printed edition of the June, 1924, number amounted to 12,323, comprising, in addition to the 8,492 paid copies, 331 depository copies and the free edition of 3,500 to cover the free list, office copies, samples, and distribution to foreign officials of the Department of State and the Department of Commerce.

SEMIANNUAL, QUARTERLY, AND MONTHLY CENSUS INQUIRIES

Statistics relating to the commodities and classes of commodities listed below are compiled and published at monthly or less frequent intervals during the year, according to legal requirements and the demands of the industries.

Boots and shoes—production (monthly).
Clothing, men's and boys'—garments cut (monthly).
Clothing, work—garments cut, shipped, returned, and in stock (monthly).
Coal, commercial stocks—prepared and published jointly with Geological Survey (irregular intervals).
Collapsible tubes—production, orders, shipments, and press operation (monthly).
Cotton—consumption, stocks, active spindles, imports, and exports (monthly).
Cotton—production, as shown by reports of ginners (12 specified dates during ginning season and at its close).
Cotton-spindle hours, active (monthly).
Cottonseed—received, crushed, and on hand, and cottonseed products manufactured, shipped out, and on hand (monthly).
Fats and oils, vegetable, fish, and animal—production, consumption, and stocks (quarterly).
Glue and gelatin—production, sales, and stocks (quarterly).
Hides, skins, and leather—stocks of hides and skins, and stocks and production of leather (monthly).
Hosiery—production, orders, and stocks (monthly).
Knit underwear—production, orders, and stocks (monthly).
Leather, glove—stocks and production (monthly).
Leather gloves and mittens cut (monthly).
Leather, sole and belting, harness, and skivers—stocks and production (monthly).
Malleable castings—production, orders, and shipments (monthly).
Mechanical stokers—sales and installation (monthly).
Paint and varnish—production and sales (semiannual).
Pyroxylin-coated textiles—shipments and orders (monthly).
Steel barrels—production, shipments, unfilled orders, and stocks (monthly).
Sulphuric acid and acid phosphate used in the manufacture of fertilizers—production, stocks, and consumption (semiannual).
Tobacco, leaf—stocks held by manufacturers and dealers (quarterly).
Wheat ground and wheat-milling products—production and capacity (monthly).
Wool consumed by manufacturers (monthly).
Wool manufactures—activity of machinery in (monthly).
Wool stocks held by manufacturers and dealers—prepared and published jointly with Department of Agriculture (quarterly).

Refusal of Certain Manufacturers to Cooperate.—In the compilation of the reports for some of these industries, serious difficulties arise from the refusal of a few establishments to supply the data needed by the bureau. The refusal of one manufacturer was due, according to his statement, to his displeasure with the attitude of Congress toward certain proposed legislation. Another declared that the census figures had been used by wholesale houses as a club against manufacturers. A clothing manufacturer claimed that the census reports were useless so far as his industry was concerned and could only work to the advantage of producers of piece goods, who were not required to make reports on their output. A few manufacturers in other industries asserted that they found the census reports of no value and claimed that it took an unreasonable amount of time and involved more or less inconvenience to supply the data.

As a matter of fact, these claims are not justified. To the great majority of the important establishments in the various industries which the bureau canvasses at monthly or other frequent intervals, the census figures are of real and unquestioned value. The president of one very large manufacturing establishment stated that the bureau's monthly reports were an important subject of discussion at directors' meetings. In general, those manufacturers who produce the bulk of the output in the industries covered by the special inquiries are able to make good use of the census reports.

The claim that current statistical information in regard to a given industry is detrimental thereto because valuable to those who supply the materials for that industry is hardly tenable, except possibly under rare and unusual conditions; for it should be obvious that any information pertaining to a particular industry which is useful to related industries or interests is also, under normal conditions, of equal or greater value to the industry itself.

There should be no difficulty whatever in supplying the data required. All that is called for in some cases is the quantity of products; in others, reports are requested on the amount sold during the month, unfilled orders, and stocks on hand. Information of this nature should be readily and easily available from the records of a manufacturing establishment equipped with almost any sort of bookkeeping system worthy of the name. It is inexpensive to the manufacturer and inexpensive to the Government, and if supplied by all or the great majority of the representative and important establishments possesses value far outweighing the cost of collection and compilation.

This value exists in greater or less degree for every establishment in each of the industries covered by the special inquiries. For many industries the census reports provide the only source of statistical information and supply the only basis on which to make calculations regarding overproduction or underproduction.

But if one or more important manufacturers in any particular industry refuse to supply the census data, it becomes impossible to compile complete reports, and thus injustice is done to the large number of manufacturers in the industry in question who have faithfully and willingly cooperated with the bureau and therefore are entitled to the benefit of full and complete statistics.

I desire to make it clear that it was on the initiative, not of the Census Bureau but of industrial organizations, that the various

special inquiries were undertaken. The bureau has not sought this extra work, but is performing it as a service to the industries represented by these organizations. Thus the refusal of certain manufacturers to cooperate is detrimental to the industries in which they are engaged.

WEALTH, PUBLIC DEBT, AND TAXATION

Every 10 years the Bureau of the Census, as required by law, compiles data regarding national wealth, public debt, and taxation. The recent canvass, covering the calendar year 1922, was completed by June 30, 1923.

The statistics were first made public in preliminary reports or press releases, each major subject being covered in this way by a series of State summaries. Four preliminary summary reports in printed form, each giving statistics by States, were also issued. In this manner the most important of the statistical material derived from the canvass was made public at much earlier dates, 18 months earlier in some cases, than ever before. The preliminary statements in many cases furnished all the information required, and it has been practicable, therefore, to print smaller editions of the final reports than were needed at prior censuses.

The final reports are five in number, as follows: Public Debt, Assessed Valuation and Tax Levies, Taxes Collected, Digest of State Laws Relating to Taxation and Revenue, and Estimated National Wealth.

The last of the copy for these reports was sent to the printer early in the present calendar year, and the first report printed—Digest of State Laws Relating to Taxation and Revenue, 1922, a bound volume of 544 octavo pages—was received May 13, 1924. These reports are being made available to the public more than a year earlier than the corresponding ones issued at any preceding census.

ESTIMATED NATIONAL WEALTH.—An estimate was made of the true value of all tangible property in the United States, real and personal, public and private. The leading items covered by this estimate were: Real property and improvements subject to taxation; real property and improvements exempt from taxation;[1] livestock; farm implements and machinery; manufacturing machinery, tools, and implements; motor vehicles; gold and silver coin and bullion; railroads and their equipment; street railways; Pullman and other cars not owned by railroads; shipping and canals; privately owned waterworks;[1] privately owned central electric light and power plants;[1] stocks of goods on hand; clothing, personal adornments, furniture, horse-drawn vehicles, and kindred property. The total for 1922 was $320,804,000,000, as against $186,300,000,000[2] for 1912. This represents an increase of 72.2 per cent, a rate slightly below that for the period 1904–1912, 73.9 per cent.

The methods employed in preparing these estimates were adopted after consultation with the General Advisory Committee. The bureau was fortunate in securing the services of Dr. Willford I. King,

[1] Publicly owned waterworks and light and power plants are included in real property exempt from taxation.

[2] Differs from estimate as originally published for 1912 because of revision of estimate for taxed real property in Oklahoma.

of the National Bureau of Economic Research, New York, N. Y., as a consulting expert on the entire census of wealth, public debt, and taxation.

FINANCIAL STATISTICS OF STATE AND CITY GOVERNMENTS

Financial statistics of cities having 30,000 inhabitants or more were first collected and compiled by the Bureau of Labor under an act of Congress approved July 1, 1898. In 1903 the work was transferred to the Bureau of the Census, and from that time the inquiry has been made annually, except for 1914 and 1920, when it was omitted because of the pressure of work on the Thirteenth and Fourteenth Decennial Censuses, respectively. The collection of financial statistics of States was first undertaken for 1915 by order of the Secretary of Commerce, and since that year such statistics have been collected annually, except for 1920.

The city and State reports, which have been compiled by the Bureau of the Census for 21 and 9 years, respectively, constitute a valuable statistical history of the income, expenditures, methods of taxation, and practically all important financial data of the States and cities, showing the changes that are taking place in the amounts of their transactions, total and per capita.

The National Association of Comptrollers and Accounting Officers, which met in Providence in June, 1924, passed a resolution providing for the appointment of a permanent committee to work in close harmony with the Director or other officials of the Census Bureau in connection with the revision of the city-statistics schedules and reports and in devising methods by which the city officials can cooperate more closely with the bureau in compiling the data annually, the object being to publish the statistics more promptly, to correct any errors that may exist, and to arrange for the cities to bear a portion of the expense entailed by this work. The city officials show a keen interest in and appreciation of the statistics compiled by the bureau and have indicated a willingness to cooperate more effectively in the future.

The National Association of State Auditors, Comptrollers, and Treasurers, at its meeting at Salt Lake City in July, 1924, adopted a resolution to the effect that inasmuch as the Bureau of the Census is the only agency publishing comparable State financial statistics, it was the desire of the association to remain in close contact with the bureau and to cooperate and assist in every manner possible in the compilation of such statistics.

STATISTICAL ATLAS

The preparation of the Statistical Atlas for 1920, which, as explained in my last report, was necessarily delayed until after the completion of the Fourteenth Decennial Census work, was commenced before the beginning of the fiscal year 1924 and was completed within that year. This publication, which has been issued in connection with each decennial census beginning with that for 1870, contains all the charts, maps, and diagrams employed in illustrating the statistics for the several branches of the census work, together with various others prepared especially for the Statistical Atlas.

SPECIAL INFORMATION FOR OTHER FEDERAL OFFICES OR FOR ORGANIZATIONS AND INDIVIDUALS

A minor but nevertheless rather important feature of the bureau's work consists in the transcribing or compiling from the census records of special information not shown in published reports. Where the amount of work involved is at all considerable, the bureau is reimbursed for the cost of the service. In some cases only a single item or a few items of information are desired; in others, special tabulations must be made.

The first class of information includes that needed by genealogists; by persons desirous of proving their ages in order to secure pensions or retirement annuites; by children whose births have not been registered and who are seeking certificates of age in order to obtain employment; by persons endeavoring to establish heirship or citizenship; and by litigants. Information of this character is merely transcribed from the census schedules, no tabulations being necessary. During the year, 1,700 visitors to the bureau were permitted to examine the population schedules of the censuses of 1800 to 1870, inclusive; but where information is desired from the returns of censuses taken subsequently to 1870, only sworn census employees are allowed to inspect the schedules.

The second class of special information is compiled directly from the original returns or from intermediate tabulations or "work sheets" prepared in the course of the compilation of the census reports proper. Requests for information of this kind come from Government bureaus, commissions, chambers of commerce, and other organizations, from corporations, and not infrequently from private individuals. What they desire is usually a more detailed tabulation than is published in the census reports regarding some particular section or locality or some special class or industry.

CENSUS OF AGRICULTURE, 1925

The census of agriculture has heretofore been taken only at intervals of 10 years, in connection with the decennial censuses of population. In 1925, however, there will be taken, under authority contained in the Fourteenth Census act, approved March 3, 1919, the first of a series of mid-decennial censuses of agriculture, less comprehensive in the matter of detail than the decennial inquiries. Thus the decennial and mid-decennial censuses together will constitute a quinquennial series. An appropriation of $3,500,000 to defray the cost of the coming census has been made and will be available during the two-year period from July 1, 1924, to June 30, 1926. Considerable preliminary work was done, however, before the beginning of this period.

The first matter to be taken up was the formulation of the schedule. For this purpose a joint committee, consisting of five members from the Census Bureau and five from the Department of Agriculture, was appointed in March, 1923. This committee received and considered suggestions from agricultural interests in general, as well as those made by the Department of Agriculture, and agreed upon a tentative form of schedule which was considered and revised by the General Advisory Committee at its June, 1924, meeting. The law provides that the census shall show the "acreage of farm land,

the acreage of the principal crops, and the number and value of domestic animals on the farms and ranges of the country," and that it shall be taken as of the 1st day of January, 1925, and shall relate to the preceding calendar year. The census thus authorized is considerably simpler in respect of detail than was the census of agriculture taken in 1920, as a part of the last decennial census; and it was, therefore, possible to reduce the number of inquiries from a little more than 400, as carried on the schedule used in 1920, to 178.

The cooperative arrangements made with the Department of Agriculture covered the field work as well as the formulation of the schedule. Under these arrangements the State statisticians of the Department of Agriculture will act as supervisors in 36 of the 208 districts and will also act in an advisory capacity to the supervisors in the other districts in their respective States; the farms in forest reserves will be canvassed by forest rangers; the farms on irrigation projects will be reported by the field force of the Department of Agriculture in cooperation with the field force of the Reclamation Service, Department of the Interior; and representatives of the Bureau of the Census will utilize, so far as possible, the offices of the county field agents of the Department of Agriculture.

By these methods the bureau will be able to effect substantial economies, and it is expected that a more satisfactory and more nearly accurate enumeration can be made than has ever been possible under the conditions existing at prior censuses.

An interesting and highly important feature of this census will be a simple enumeration of the farm population. The schedule calls for the number of persons living on each farm, classified according to color, whether over or under 10 years of age, and, in the case of those over 10 years of age, according to sex.

MECHANICAL LABORATORY

The experimental work in the development of automatic card-tabulating machines designed to add numbers instead of merely tallying units was completed prior to the close of the fiscal year 1924. Operations in the mechanical laboratory during that year were confined largely to the construction of automatic tabulators of this type ("adding printers"), a total of six having been completed and put into commission. One of these machines was equipped with "split" registers for use in tabulating the bureau's time and cost data, thereby making possible a saving of one-half the time formerly required for this operation. Two additional machines of the adding-printer type are in process of construction. Special tools, including punch-press dies and fixtures, were made in the mechanical laboratory for use in the production in duplicate of certain parts entering into the construction of these machines.

In addition, 25 punches, 9 verification machines, and 3 sorting machines have been reconstructed or modified in order to adapt them for use with the new type of tabulating machines or otherwise to meet the changing requirements of the census work.

INCREASE IN WORK

The Census Bureau is under continual pressure to increase the scope and complexity of its inquiries. Trade organizations desire

more frequent compilations of data regarding the industries in which they are interested. Chambers of commerce and boards of trade call for statistics showing the amount and character of manufacturing done in small cities. Beginning with 1921 the census of manufactures, formerly a quinquennial inquiry, has been taken biennially. The Department of Agriculture and students of agricultural phenomena in general ask for detailed and comprehensive statistics in regard to farms, farm property, and farm operations. Organizations and individuals interested in social problems request further statistical information pertaining to such matters as immigration, child labor, crime, insanity, and pauperism. There is a demand for a population census at quinquennial instead of decennial intervals, in order to provide a proper basis for the calculation of birth and death rates and other per capita rates.

The bureau's current work is thus very considerably in excess of what is was 10 years ago. There has been only a small increase in its permanent force, an increase far from commensurate with the increase in work, and the appropriations made for payment of salaries and other expenses, including the cost of field work, are no longer adequate. It is probable that the time is near at hand when it will become impossible to meet the increased demands upon the bureau by further improvements in methods and processes. It may even become necessary to reduce somewhat the amount of work now carried on, unless larger appropriations are made to defray its cost. I do not mean by this that I contemplate recommending the discontinuance of any important inquiry, but it may become necessary to simplify the collection and compilation of the data, with the result that the statistics will be presented in less detail and will not provide all the information which the bureau is called upon to supply. For example, at the biennial census of manufactures the canvass could be restricted to those establishments with an annual output valued at, say, $20,000, instead of $5,000, the present limit; or the annual mortality statistics, which are now presented in great detail, could be reduced in scope. Such expedients as these would impair somewhat the value of the statistics, but the bureau's work is growing from year to year with the growth of the country and its industries, and there is a limit to the amount of work that can be done at a given cost.

I fully realize and appreciate the need of economy along all lines of Government work and am ready and willing to do my share in this direction; but it is my desire also to maintain the census work at the highest possible standard of value and usefulness, and this can not be done under present conditions.

In particular, the bureau can not properly and completely discharge its functions as the central statistical agency of the Federal Government if it is to be handicapped indefinitely by a salary scale under which its statistical experts—its professional and scientific officials and employees—are paid smaller salaries than are given elsewhere for work requiring corresponding degrees of ability.

IMPROVEMENTS AND ECONOMIES

During the fiscal year 1924 a number of improvements and economies in the census work were put into effect and others already in

effect were further developed. Of these, the following are worthy of particular mention:

CENTRALIZATION OF FIELD WORK

The centralization of the field work under a single supervising head, inaugurated last year, has been perfected and has resulted in economies in conducting the various inquiries. Under the present plan there is no duplication of work, such as frequently occurred in former years when two field employees engaged on different inquiries were sent to the same locality.

ENLISTMENT OF AID FROM INDUSTRIAL AND COMMERCIAL ORGANIZATIONS

It has been the policy of the bureau for many years to secure the greatest possible measure of cooperation from such organizations as manufacturers' associations, chambers of commerce, and boards of trade. This cooperation has been productive of highly satisfactory results and was an important factor in reducing the cost of the canvass for the biennial census of manufactures.

COOPERATION OF MANUFACTURERS

The persistent efforts of the bureau to secure the cooperation of manufacturers in reporting data on production, stocks, and sales have met with a considerable degree of success and have resulted in a material saving in cost and in the advancement of the dates of publication of these important data.

COOPERATION OF STATE REGISTRARS OF VITAL STATISTICS

Closer cooperative arrangements have been entered into with State registrars in connection with the collection and compilation of data in regard to births and deaths.

COOPERATION OF STATE, COUNTY, AND CITY OFFICIALS

The cooperation of the officials of the States, counties, cities, and other tax-levying governmental units has resulted in increased economy in the collection of data for the census of wealth, public debt, and taxation, and has been a factor in expediting the publication of the statistics.

ENCOURAGEMENT OF STATE OFFICIALS TO COLLECT MARRIAGE AND DIVORCE DATA

The bureau has encouraged State officials to collect data in regard to marriages and divorces. The number of States which now furnish these data has been increased, and more satisfactory arrangements have been made with county clerks to make their reports on a piece-price basis, thus reducing the cost of the field work for this annual inquiry.

AVOIDANCE OF DUPLICATION

The bureau has kept in close touch with other Federal offices engaged in statistical work in the endeavor to avoid duplication, to

perfect methods, and to assist in the compilation of data needed in connection with the work of any branch of the Government.

REORGANIZATION OF TABULATION FOR INDUSTRIAL CENSUSES

The tabulation of the statistics for the industrial censuses, and particularly the biennial census of manufactures, has been reorganized and simplified, and as a result the publication of the statistics has been greatly expedited.

CENTRALIZATION OF MECHANICAL TABULATION

The work of mechanical tabulation, which prior to July 1, 1923, was scattered through several divisions of the bureau's organization, was on that date concentrated in one division under a single supervising officer. The force engaged on this work during the fiscal year ranged from 55 to 64. The work done was equivalent to the mechanical handling of nearly 73,000,000 cards. The extent of the saving in time and cost is indicated by the fact that the tabulation work was done with no increase of force, although it included new work equivalent to the handling of more than 12,500,000 cards (for the institutional population), or about one-sixth of the total for the year; in other words, a force averaging about the same as that employed during the preceding year took care of about 20 per cent more work.

PROMPTNESS OF PUBLICATION

Since I have been director, it has been my constant aim to publish the census statistics with a minimum of delay. It is now the invariable practice to give out preliminary reports, usually in the form of press summaries, as soon as the tabulation of the returns has reached such a stage as to make possible the preparation of exact or approximately correct summaries of the basic or fundamental data.

In this way the bureau makes public the more important and fundamental statistics in regard to its various inquiries at dates ranging from six months to a year or more in advance of the publication of the final reports. It is obvious, therefore, that, despite the considerable time which necessarily elapses between the date to which a given inquiry relates and the publication of the complete and final reports, the public is not kept waiting unreasonably long for the more important results of the inquiry.

REDUCTION OF PRINTING COSTS

Not the least of the census economies has been the saving in printing costs. This saving has been brought about in three ways: (1) By reducing somewhat the number and size of the statistical tables and the amount of text in the reports; (2) by changing the form of the printed reports from quarto to octavo; (3) by reducing the size of the editions available for free distribution.

The change from the quarto to the octavo form has made possible greater compactness. Although the amount of space is only one-half as great on an octavo page as on one of quarto size, it has neverthe-

less been possible to print the bureau's reports in bulletins or bound volumes containing considerably fewer than twice as many pages as were needed when the quarto form was in use. By the use of thinner paper, the thickness of the volumes has been kept within reasonable limits. Prior to the beginning of the fiscal year 1924 all the important printed reports and bulletins issued by the bureau were in quarto form. At present the octavo form is in use for all except the annual birth-statistics and mortality-statistics reports, which it will be more difficult to adapt to the smaller-sized page. Although the editions available for free distribution have been reduced in size, copies of nearly all the census publications may be obtained at moderate prices by purchase from the Superintendent of Documents.

EFFECT OF RECLASSIFICATION

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, and for this reason the reclassification of the force was attended by special and peculiar difficulties.

The census work needs for its proper performance men and women skilled in statistical science and possessing as high a type of ability as those in other branches of the Government service. In former reports attention has been called again and again to the great handicap, due to its low salary scale, under which the bureau labors in performing the technical and difficult duties assigned to it by law. This handicap still exists, and until it is removed the bureau can not function at maximum efficiency.

RECOMMENDATIONS FOR CHANGES IN CENSUS LAWS

INDUSTRIAL AND BUSINESS STATISTICS

The monthly collection and publication of current industrial and business statistics, authorized under section 8 of the act establishing the department, was considerably extended during the year. The work has now assumed such proportions as to render desirable the enactment of specific legislation authorizing it. Such legislation would aid in the collection of the data, particularly from the comparatively small number of manufacturers and others who are unwilling or reluctant to supply the information requested by the bureau. I therefore recommend the enactment of a law authorizing and directing the Director of the Census to collect, compile, and publish statistics of current production, consumption, stocks, shipments, orders, receipts, and sales, for commodities used and produced in manufacturing.

COTTON

There is an insistent demand for information as to the several grades of cotton held in the United States. As stated in my report for 1922, it is impossible under present conditions to secure reliable information of this character, since much of the cotton is not accurately graded until it reaches the more important cotton markets

or concentration points, the grading in the less important markets not being uniform. Since practically all the cotton produced in the United States enters into either interstate or foreign commerce, it is within the power of Congress to enact legislation requiring such cotton to be graded and stapled under governmental regulations at central grading stations. The Government could provide the necessary personnel and facilities, but the cost of the grading, which probably would not amount to more than 30 or 40 cents a bale, should be paid by the owner of the cotton.

With uniform grading thus provided for throughout the cotton-growing region, it would be possible to obtain from the grading stations the numbers of bales of the several classes graded, and from consumers and exporters the numbers of bales of the several grades consumed or exported.

I accordingly renew the recommendation made in my last two reports, that legislation be enacted providing for the grading and stapling of cotton under the supervision of the Federal Government.

I also renew the recommendation, made in my last three reports, that that portion 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 explosives, and of absorbent and medicated cotton, be repealed. This legislation was enacted because of the amount of cotton consumed in the manufacture of explosives, etc., during the World War. The necessity for statistics of this character has now passed.

STOCKS OF LEAF TOBACCO

In my report for 1923 I recommended that the collection of data concerning the quantities of the several types of leaf tobacco held by certain classes of manufacturers and dealers, required by the act of Congress approved April 30, 1912, be transferred to the Bureau of Internal Revenue. That bureau now collects monthly reports of the transactions in leaf tobacco from all registrants, and by changing its forms somewhat could obtain all the information concerning stocks of leaf tobacco now collected by the Bureau of the Census, thus avoiding duplication and the necessity for the same establishments to make reports to two Federal bureaus.

Furthermore, the law limits the work of the Bureau of the Census to the collection of data from those dealers in leaf tobacco having an average of 50,000 pounds of tobacco in stock at the close of the four quarters of the preceding calendar year. It is impossible to comply literally with the requirements of this law, and if the work is to be continued by the bureau it is recommended that the law be amended so as to require reports from all registered tobacco dealers, irrespective of the amounts of tobacco which they carry in stock.

It is also recommended that, if the bureau is to continue to carry on this work, the law be amended so as to permit the reports to be sworn to before postmasters and assistant postmasters. Such an amendment would save considerable time and expense to the persons required to make the affidavits.

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, 1924.

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, 1924:

In no previous year has the bureau rendered such extensive service, and never before have the concrete evidences of its work been so substantial and so gratifying. In the past two years this work has more than doubled in quantity, and during the year just ended the number of instances in which it has aided American business men have totaled nearly 1,250,000, with an average of more than 5,000 inquiries a day at the close of the fiscal year. On the basis of an investigation involving 3,675 inquiries addressed by business firms to the bureau it was found that the resulting business amounted to about $427 per inquiry. This would mean over $500,000,000 in foreign trade secured for the United States as the result of answers to inquiries handled by the bureau during the year. In certain respects the bureau's services to the American business community have increased as much as tenfold since 1922.

The vital value of the bureau to all Americans concerned with world trade was signally illustrated during this past year by its informational and promotive efforts following the great earthquake disaster in Japan. Though our office in Tokyo was destroyed and its established routine shattered, the work was immediately resumed and vigorously pushed forward. Accurate estimates were given of the extent of the damage to the economic structure of Japan. Americans relying on raw materials from Japan were advised of the position and prospects. Markets for reconstruction materials were investigated. The purchase of great quantities of supplies here was furthered. In every phase of the situation the bureau was alert, active, and helpful.

Yet this was only the most outstanding example of a service which, throughout the world, has been constantly growing in effectiveness. Profiting by their accumulated experience and utilizing ever more skilfully all the available means of trade promotion, our offices abroad and our divisions at Washington have made their efforts show a steadily rising proportion of practical results. Those efforts have been determined not by mere theories but by the specific requirements of American business, directly and precisely expressed.

During the past year the most significant feature of our work is to be found in this element of intimate contact and cooperation with

American manufacturers, exporters, financiers, and domestic merchants. Now, more than ever before, the bureau is functioning as an integral part of American economic life—an organization responsive to the guidance of its clients, while at the same time initiating a variety of services designed to strengthen and augment the currents of our trade.

Several new offices of the bureau have been opened in this country and abroad. A domestic commerce division has been set up in the Washington office, aiming to furnish in the domestic field a service comparable to that which has been provided so successfully with respect to export markets. These and numerous other departures and modifications in the work of the bureau are mentioned in succeeding paragraphs.

REGIONAL DIVISIONS

GENERAL CHARACTERISTICS OF WORK

As in previous years, all the regional divisions 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.

Each of the foreign offices prepares regular and special reports for the bureau; supplies information and advice in response to specific inquiries by letter; satisfies the requirements of those who call in person for data or for guidance; conducts such investigations as seem timely and appropriate under existing economic conditions; adjusts commercial disputes between foreign and American firms; arbitrates difficulties where such service is requested; enables American investigators to gain access to foreign establishments; provides sources of information for American publicists; warns of any illegitimate phases of foreign competition; watches any possibly discriminatory proposals; maintains close relations with the foreign government; cooperates with the American Embassy or Legation; and, in general, constantly facilitates such contacts and connections as will result in increased sales for American goods.

ACHIEVEMENTS OF REPRESENTATIVES IN WESTERN EUROPE AND SOUTH AFRICA

The bureau's office at Rome gave invaluable help to American interests in connection with a contract involving nearly $3,000,000 for harbor works in Italy, a mining development on which it is pro-

posed to spend $6,000,000 to $7,000,000, and a concession for mineral exploration in Italy entailing the expenditure of $5,000,000. An American company was aided in obtaining a large Government contract for coal. There was an increase in the number of American visitors and of inquiries from American firms. The office helped American manufacturers to establish suitable connections for representation in Italy. Expert advice was furnished concerning competitive conditions, selling methods, etc. Commercial disputes were adjusted. The office intervened successfully in controversies over customs classification.

Among the many special investigations made by the Rome office were an exhaustive study of the electrical-equipment market and a detailed survey of the machinery trade. Other special reports, which comprise a very large number of subjects, include "Italian tax reforms," "Motor-vehicle preferences," "Marine motors and motor boats in Italy," "The hat industry in Italy," "The present tariff situation in Italy," "Italy as a market for jewelry," "The Italian market for automotive accessories," "Italy's coal and oil requirements," "The tanning industry in Italy," "Italy's balance of international payments," and "Selling American specialties in Italy." There has been close cooperation with the American Embassy and the various consular officers. The commercial attaché has taken a prominent part in the activities of the American Chamber of Commerce for Italy at Milan and of the Associazione Italo-Americana at Rome.

Much expense has been saved American exporters through the action of the Madrid office in obtaining the release of goods held up by Spanish customs officials on technical grounds. In several cases the office has obtained customs classifications more favorable to Americans. Sixty American automobiles, reaching Spain not properly documented, were entered at the preferential customs rate through the commercial attaché's effective action, and automobile tires were also admitted at the low-duty rate, though not correctly marked. The prompt and energetic intercession of the commercial attaché in the interests of an American firm, which was not properly protected in the advances it was making to a foreign firm, resulted in a saving of $250,000 to the American concern. Efficient help was given in connection with the prorogation of the Spanish-American treaty. A financially embarrassed Spanish company was investigated in order to obtain the most favorable settlement possible for its American creditors. An American food-products concern was assisted in an extensive investigation. Very close relations have been maintained with the American Ambassador to Spain, who at times called for almost the entire time of the commercial attaché's office. The facilities of the office have been at the disposal of the representative of the United States Department of Agriculture, who is studying the Almeria grape situation in connection with the ravages of the Mediterranean fruit fly.

The Hague office cooperated constantly with the American Legation in matters connected with the petroleum question, tariff and treaty problems, banking and credit conditions, current Dutch-Russian negotiations, and investment questions. Agencies were placed for automobiles, accessories, marine motors, textile fabrics, canned goods, radio equipment, and cigarettes. The office prepared exhaust-

ive studies on the Dutch quinine monopoly, methods of handling coffee in Amsterdam, the effect of the Ruhr occupation on Dutch-German trade, the Dutch motor-cycle market, elements in florin exchange, direct taxation, comparative wage rates, and the application of electricity in Dutch agriculture. Other important reports covered budget questions, State revenues, the public debt, trade with Russia, markets for specialties, sporting goods, tobacco, electric-light fixtures, furniture, canned and chilled meat, and jewelry, together with such local industries as chocolate, cocoa, strawboard, and textiles. The office participated for the first time in the Spring Commercial Fair at Utrecht. It collected various contested accounts for American firms.

The sphere of operation of the Brussels office was extended to cover German foodstuff imports through Rotterdam and Antwerp. The projected revision of the Belgian tariff entailed extra work. The office intervened successfully in cases of overvaluation or troublesome classifications under the existing tariff, one outstanding effort being in behalf of a large American automobile assembling plant at Antwerp, with results that saved the company a sum approaching 500,000 francs. Through the intervention of the Brussels office the procedure at the customs frontier was simplified for such imports of raw skins as were used by an American fur dealer with a factory in Belgium. Semiannual reports on the Belgian cotton and glass industries were prepared, together with studies of production costs in the shoe industry, coal supply and consumption, zinc and aluminum production, lithopone and glycerin, radio developments, tobacco production and consumption, the National Bank of Belgium, the Belgian national debt, the Belgian wool industry, and markets for specialties, industrial machinery, automobile accessories, electric-light fixtures, hardware, furniture, proprietary medicines, and toilet preparations. Numerous agencies were placed for American automotive products and other specialties, such as fountain pens, radio apparatus, phonographs, canned goods, storage batteries, and toilet articles. An American exporter of frozen fish was placed in contact not only with a sales agency but with a refrigerating plant ready to construct an expensive extension expressly to handle this new commodity.

The intervention of the Vienna office with the Austrian customs authorities in obtaining quicker release of meat shipments meant a saving of large sums to one American concern. Much has been done toward facilitating the import of American automobiles into Austria. Advantageous office quarters were obtained for a large American steamship line. Conferences were arranged between representatives of a large American tobacco-growing combination and the directors of the Austrian tobacco monopoly to lay plans for future sales. Many advantageous connections have been effected between American firms and Austrian agents. The more important reports submitted included those on "The Austrian iron and steel industry and trade"; "The Austrian textile industry"; "Austrian commercial policies and treaties"; "The tobacco industry in Austria"; "The Vienna spring fair"; "Austrian cotton survey, August, 1923, to March, 1924"; "Sporting goods in Austria, Hungary, and Yugoslavia." Among the 3,000 letters written to American business interests during the year were communications relating to representa-

tives for American goods, buying and selling conditions in the Austrian market, questions concerning taxation, tariffs, and licenses, the standing of firms and individuals, and trade lists.

The Paris office has brought about numerous connections between American and French firms. A misunderstanding between the French customs authorities and a well-known American sugar-refining company was adjusted. For American concerns interested in the steel industry interviews were secured with French experts relative to cast-iron standards, cast-iron pipe specifications, and pig iron. Much work was done in connection with the obtaining of licenses to export merchandise to the United States from the occupied territories of Germany. Representations on behalf of pitch-pine producers in America relative to the high French railway rates on this commodity resulted in a new classification involving a noteworthy reduction in rates. Customs-tariff matters have taken much time; an example of specific results is the favorable rate secured for a particular type of soap.

There was extensive cooperation with the American Embassy, the consulate general at Paris, and the consulates at Marseille and Algiers; an arrangement was effected to prevent duplication of work. The 154 special reports from the Paris office included reports on the progress of reconstruction in France, silk production, the steel industry, the textile industry, Government and private finance, and commodities such as furniture, paper, agricultural machinery, industrial machinery, insecticides, zinc, boots and shoes, as well as several reports on Switzerland and Algeria.

The commercial attaché at Paris made a trip to Marseille in connection with oilseeds and one to Algiers for a general investigation. The assistant commercial attaché went to Switzerland for a general study of conditions. The Paris office aided United States exporters at the Lyon Fair, and a visit to Lyon was made by an assistant trade commissioner.

Probably as a result of the transfer of the bureau's London office from the embassy to Bush House there was a great increase in the number of visitors seeking service. Various members of the staff visited industrial centers of England, Ireland, Wales, and Scotland and some of the men made visits to the Continent and to the United States. At least 40 agency arrangements for American firms have been effected by the London office, some of these leading to large orders. By facilitating approval of gasoline pumps by the British Board of Trade the London office made it possible for an American maker to deliver on several big orders. One of the trade commissioners handled arrangements connected with the purchase of 500,000 yards of khaki for the United States Marine Corps, in which purchase it is calculated the Government saved more than $180,000. The office succeeded in having a cargo of American cattle exempted from an embargo (resulting from foot-and-mouth disease in Great Britain), thereby saving from $40,000 to $50,000 for the vessel's operators and the shippers. The office made it possible for an American advertising agency in London to obtain a very good contract with an important British manufacturer of chemicals. Advice and help has been given to British firms seeking American capital. The character and conduct of existing agency arrangements in Britain have been investigated in the interest of American firms.

During the year 385 special reports were forwarded from London, covering nearly all phases of economics, trade, and industry. Only a few typical titles can be mentioned: "Will British business recover?," "Results of the Imperial Economic Conference," "Housing in the United Kingdom," "What American textiles can be sold in Great Britain," "Trading with and trading within Great Britain," "Safeguarding and spreading business in Great Britain," "Review of British finance in 1923," "Economic aspects of Irish Free State," "The business of freight forwarding in Great Britain," "Direction of British steel trade in 1923," "McKenna duties and the British motor trade," "1923 results in Ireland's agriculture," "German competition and the British boot and shoe industry."

Representatives of the United States Departments of Labor, Agriculture, and Treasury and of the Tariff Commission and the Shipping Board were frequent visitors at the London office. The commercial attaché was absent from the office for a considerable time, and while on the Continent he was of assistance to the committee of experts working in connection with the Dawes plan.

The Prague office secured the entry of a number of American automobiles that were being held by the customs authorities. It aided an American banking firm that had invested $6,000,000 in Czechoslovak lumber developments. The representative of an American automobile firm was assisted in establishing a market in Czechoslovakia. An American sanitary-supply house purchased in Prague a process that came to its attention through the bureau's office. There has been an unusually large number of inquiries from American firms concerning possible markets in Czechoslovakia. Most of these have involved a good deal of investigation, and in their replies the members of the Prague staff have tried, wherever possible, to connect American sellers with Czechoslovak buyers.

About 300 inquiries from American firms were answered by the bureau's office at Johannesburg, South Africa, many of these covering market analyses. Trade lists were furnished, and commercial information concerning specific local firms was given. The most important work was the investigation of prospective agents for American firms, the adjustment of claims, and the removal of customs discrimination. Assistance was given to American business men and Government officials visiting South Africa. Opportunities for the sale of American goods were reported. Among the topics covered in the special reports were gold, diamond, and coal mining, South African foreign trade, highways, Union Land Bank, lumber trade, textile trade, pineapple growing, petroleum trade prospects, production of deciduous fruits, and markets for textbooks and school supplies, wire netting, sporting goods, felt hats, roller skates, tinware, jute webbing, elastic webbing, and hair felt.

With stable currency and prices in Germany, the detailed material of commodity reports from the Berlin office has taken on a new significance. The office has given much aid to American exporters seeking to develop sales in Germany. Among the American firms that were aided in marketing their products may be mentioned a large fruit-growing concern, two of the largest automobile concerns, and a prominent textile firm. More than 1,200 American visitors registered at the Berlin office during the past year, and the service to them has formed an important phase of the work. When the

Dawes committee visited Berlin, data were furnished by the bureau's office there, contacts were made, and detailed conferences were held. Numerous American concerns availed themselves of the services of the Berlin office in connection with shipments going through the formalities of the customs either to or from the occupied territories.

At Copenhagen very encouraging results have been obtained in extending the direct trade-promotion work. Besides establishing new connections for American firms, the acting commercial attaché has been very active in assisting American branch houses and representatives. Particular attention has been paid to the automotive market. Among others, proper agencies were placed for a large American railway-equipment concern, a large raw-cotton house, and several lumber shippers. Substantial aid has been given to Americans investigating the Danish cooperative movement and Danish agriculture. The American members of the Interparliamentary Conference held in Copenhagen last year were also given considerable assistance. The banking crises in Scandinavian countries needed to be followed very closely, and the reports that the Copenhagen office submitted were very favorably received. The service in bringing about a repeal of the Danish rubber-marking regulation has been of signal importance to American manufacturers. Considerable time and work have been expended in endeavoring to effect adjustments of commercial disputes; the settlement of one such dispute resulted in the payment of $1,300 to the American claimants. Several trips have been made in Norway and Sweden for the purpose of making specific investigations and keeping in closer touch with developments in those countries.

WESTERN EUROPEAN DIVISION AT WASHINGTON

Through its advisory committee, consisting of two bankers, three manufacturers, and an economist, the division has been able to maintain close contact with the more important problems confronting American manufacturers interested in the European field. The chief of the division has maintained close contact with chambers of commerce throughout the United States and with the more important industrial and banking organizations.

The division has continued its efforts to keep American business currently informed of the condition of western European government finance. Trade information bulletins such as Budgets of Western European Countries, French Government Finance, Italian Government Finance, Belgian Finance and Industry, and Spain, as well as leading articles like "The internal value of the French franc," "The passing of the German mark," and "Depreciated exchange in western Europe," indicate the type of work done. Bulletins and articles have been published periodically on the questions of labor, wages, and costs of production in Europe as compared with those in this country. In continuation of the plan to give the American business public accurate and detailed information concerning certain regions that hitherto have been considered as neglected markets trade information bulletins, such as Belgian Congo, Madagascar, British Possessions in East Africa, and French Possessions in Tropical Africa, have been issued. In addition to publishing information concerning American trade with the countries of

western Europe in trade information bulletins, such as Franco-American Trade and American Trade with Germany, and in Commerce Reports articles, this division has furnished regularly statistics on trade, production, and finance for publication in the Survey of Current Business. It has also given private circulation to reports through confidential and special circulars sent to a selected list of business houses. The importance of the western European field is shown by the fact that during the year 336,000 inquiries concerning western European conditions were answered by the bureau and its district and cooperative offices.

The division has furnished to the Secretary of Commerce exhaustive studies concerning developments in western Europe, and the other departments of the Government have been supplied with information falling within their scope. The division prepared a study of the Economic Problems of Western Europe, which was published by the American Bankers Association and distributed to all members.

WORK OF REPRESENTATIVES IN EASTERN EUROPE AND LEVANT

The cablegrams and other reports from the office at Warsaw, Poland, have enabled exporters to keep abreast of the constantly changing export and import tariffs of Poland, of the complicated, rapid changes in the banking and currency situation which culminated in the formation of a new bank of issue and the adoption of the new "zloty" currency, and of the consequent marked "ups and downs" in the general business situation. The office has steadily striven to obtain for American cotton and tobacco export firms orders placed by the large Polish textile mills and the tobacco monopoly. It has aided Warsaw agents for these and other American commodities, such as automobiles and typewriters. The office adjusted the claim, amounting to almost $500,000, of a large American cotton exporter against a Polish textile mill. It was also instrumental in securing an adjustment of the differences between an American corporation and the Polish Government over the terms of settlement for a large radio installation. More recently it has assisted in the placing of an order by the Polish Government with several large American mining and smelting concerns for the furnishing of the new subsidiary coinage for the country. Among the 64 special reports submitted by the Warsaw office were "Polish conditions in 1923"; "Polish iron and steel industry"; "Polish Government finances, 1923"; "Polish leather trade"; "Polish tobacco industry"; "Condition of Polish Silesian coal industry"; "Polish petroleum and refining industry"; "Polish woolen textile industry"; and "Polish Silesian industrial activity, 1923."

The Riga office, whose jurisdiction embraces Latvia, Finland, Esthonia, and Lithuania, has aided numerous American concerns in securing orders, selecting foreign agents, organizing subsidiaries, and establishing closer contact with local merchants and governmental agencies. A large number of manufacturers were invited to submit catalogues and samples to be displayed by the trade commissioner personally at the Fourth Riga Fair. The trade commissioner has been active in the adjustment of claims and the protection of American interests, especially as to trade-marks. He was instrumental in arranging for the extension of time limits on bids for Gov-

ernment contracts, so as to give American firms an opportunity to compete. Through the efforts of the trade commissioner much more satisfactory statistical data have been obtained from the governmental agencies. The office during the year has made 79 special reports, among which may be mentioned a very exhaustive study of the match industry in Finland, "Russian lumber industry and exports," "Esthonian industries," "Lumber market of Latvia," "Aircraft development in the Baltic States," "American typewriters in the Baltic States," "Market for office machinery," "Motion-picture situation," and other important subjects. The office has begun the preparation of a general economic survey of the Baltic States.

In cooperation with the American Legation the acting commercial attaché at Bucharest has aided American creditors with respect to the collection of claims in Rumania—a serious problem in view of the moratorium declared on behalf of private debtors as regards certain of their obligations to foreigners. He has been of much assistance to the legation in its efforts to protect American interests whose investments are jeopardized through the passing of the new mining law by the Rumanian Parliament. At the instance of the trade commissioner an American concern has recently been established in Rumania for the purpose of handling a variety of lines of American goods. Numerous extended special reports have been made, covering, among other subjects, "Rumania's foreign trade," "The market for industrial machinery," "The outlook for foreign business and investment," and reports on the Banat of Timisoara (Temesvar), on Transylvania, and on Bessarabia, representing the results of trips of investigation to those regions. He has prepared regularly each month standardized reports as to the three basic industries of Rumania—agriculture, petroleum, and lumber—giving data as to production, prices, exports, and market conditions.

The trade commissioner in charge of the Constantinople office spent a considerable part of the year in the United States, where he conferred extensively with business men and made addresses in various cities. Drastic changes in political conditions in Turkey necessitated numerous reports of a general character. In addition to these the office made nearly 100 special reports, among which may be mentioned "Crop and livestock statistics in the territory of New Turkey," "Turkish market outlet for leading commodities," "Constantinople rug and carpet market," "Turkish production of gum tragacanth," "Adding and calculating machines in Constantinople," "Turkish cotton-goods market," etc. A leading American construction firm, through the good offices of the bureau staff at Constantinople, was aided in negotiations for an important engineering project. A considerable amount of time was spent in helping to adjust trade disputes and to settle old accounts.

The Athens office was very diligent in keeping American business men in close touch with the shifting situation in Greece. The office has made periodical reports on the two principal export industries of Greece—currants and tobacco. Its services in investigating the sanitary conditions in the currant-packing establishments have been repeatedly commended. Among the 100 special reports prepared by the Athens office during the year may be mentioned "1924 outlook for automotive trade," "1924 outlook for lumber trade," "Motor-vehicle preferences," "The Greek canning industry," "Mar-

ket for certain specialties in Greece," and "Toilet preparations in Greece." Important services were rendered by this office in connection with the protection of American interests against losses arising from the disturbed economic conditions and the extraordinary exchange regulations and similar measures adopted by the Greek Government.

Before leaving for his post, the trade commissioner appointed to Alexandria, Egypt, made an extended trip through the United States, chiefly to interview cotton manufacturers. He then spent several months in England acquainting himself with textile conditions there. The Alexandria office has investigated the Egyptian cotton situation and also the general market for American goods. Among the special reports from Alexandria may be mentioned "Extending automobile sales in Egypt" and "American cotton piece goods little known in Egypt."

EASTERN EUROPEAN AND LEVANTINE DIVISION AT WASHINGTON

Besides revising reports from the field, the eastern European division compiled numerous articles for publication in Commerce Reports or as special circulars or bulletins. Among the articles of this character published in Commerce Reports were "Economic conditions in eastern Europe in 1923" (covering each of the more important countries); "Foreign trade of Sudan for 1923," "The new Polish bank of issue," "Lithuanian cooperatives, 1923," and "Lithuanian foreign trade, 1923." Among the material compiled by the division and published as special circulars and bulletins there may be mentioned "The status of Rumanian negotiations with foreign creditors," "Activities of the Central Union of Esthonian Consumers' Societies in 1922," and "Economic and financial notes on Palestine." The Levantine section prepared the handbook of Tunis which appeared during the year. In cooperation with the finance and investment division, the division has rendered service to a number of American banks and business concerns interested in investment in eastern Europe.

The Russian section has analyzed and abstracted Soviet Government publications, newspapers, and reports, which now form the most authoritative source of information on Russia. Among the Russian section's major articles in Commerce Reports may be mentioned "State trusts in Russia," "Production in nationalized industries," "Developments in currency and finance," "Agricultural cooperatives," and "Agriculture in 1923." Special attention has been given to reports of Russia's foreign trade. A special circular on the Chukotsk Peninsula of Siberia was printed. There has been a demand for a large number of copies of a trade information bulletin on Foreign Capital Investments in Russian Industries and Commerce. A trade information bulletin was issued on Finance and Industry in Soviet Russia, giving a detailed account of developments in 1922 and 1923. Lawyers, insurance companies, and other firms have been given valuable information with respect to decrees of the Soviet Government. Opportunities for the sale of electrical sheet steel, cotton, specialized machinery, and other commodities were brought to the attention of American business. Direct assistance was rendered to a prominent ore and metal trading concern looking to contracting for the supply

of Caucasian manganese ore and to another seeking to insure a supply of Russian bristles.

The chief of the division addressed an important gathering of American manufacturers and exporters in New York, and also delivered addresses before audiences of business men in Boston and Cleveland. As chairman of the committee for the supervision of the new Commerce Yearbook, he devoted considerable time to the preparation of the first and second issues. He was also engaged in revising the Statistical Abstract of the United States.

FIELD REPRESENTATIVES IN THE FAR EAST

The commercial attaché to China went to Japan three weeks after the great earthquake of September 1, 1923, relieving the attaché in Japan (who returned to the United States early in October); he reorganized and reestablished the bureau's services in Japan and also organized the American Merchants Association in Tokyo. He returned to Peking early in November.

The assistant commercial attaché at Peking has specialized in financial problems and has done valuable work in connection with the claims of American firms against the Chinese Government. The Peking office worked in close cooperation with the American Legation throughout the year, especially with relation to the financial problems just mentioned and the many questions arising from the new China trade-mark law and regulations.

The Shanghai office received more than 1,000 callers during the year and prepared more than 4,000 trade letters and reports of all kinds. About 200 special reports were completed, including investigations of "Shanghai wheat handling," "Automotive accessories and equipment," "Market for sole leather," "Motion-picture activities," "Rice production and distribution," "Eggs and egg products," "Markets for foodstuffs," "Markets for gramaphones," and "Artificial indigo."

Close contact with American firms in China was maintained, and the Shanghai office gave specific help to numerous companies, being responsible in some instances for obtaining substantial orders. A mimeographed monthly trade and economic report (of 30 to 40 pages) on conditions in China was sent to the American business men in China. In December, 1923, the Shanghai office inaugurated a weekly circular, which was distributed to American business houses in Shanghai, advising them of trade opportunities in the United States and China and of material available in the Shanghai office. Forty-five American industrial motion-picture reels were kept in circulation among the theaters, colleges, Y. M. C. A.'s missionary schools, chambers of commerce, and guilds. The showings of these films were usually accompanied by lectures in Chinese.

The earthquake and fire of September 1 completely destroyed the bureau's office at Tokyo, Japan. There was opened at Kobe a temporary office, which was closed shortly after the middle of November.

The most important work of the Japan organization has been in connection with reconstruction business. American interests were advised of conditions even before communications had been fully restored. Much valuable service has been rendered by timely reports

on the economic aspects of Japan after the earthquake. Other important reports included "Market for marine engines and motor boats," "Japanese dye industry," "Demand for shuttle blocks," "Automotive situation," "Review of cotton-fabric trade," "Market for sporting goods," and "Japan's lumber imports." An important feature of the 1923 work of the Tokyo office has been the preparation each month of a mimeographed review (15 to 20 pages in length) of conditions in Japan; this is distributed to members of the American Merchants' Association as well as to merchants and trade organizations in the United States.

During the first half of the fiscal year the territory covered by the bureau's Manila office included, in addition to the Philippine Islands, the Dutch East Indies, British Malaya, French Indo-China, and Siam. With the establishment of a trade commissioner's office at Batavia, Java, in the latter part of December, 1923, however, the Dutch East Indies and British Malaya were placed under the jurisdiction of that office. Considerable headway was made by the Manila office in the preparation of a series of major reports dealing with each phase of the Philippine Islands' economic, agricultural, and industrial development. Conspicuous among the subjects treated were the Philippine sugar, lumber, and embroidery industries; tobacco culture and trade; kapok production; abaca (Manila hemp) cultivation and production; and copra, coconut oil, and copra-cake production. Periodic reports and forecasts were made on the leading commodities in which American exporters are interested. A quarterly report on the automotive market was inaugurated. There was helpful cooperation with the office of the Governor General and the leading departments of the Philippine Govenment; matters dealt with included the new legislative requirements for shipments of copra and coconut oil from the Philippines, the application of the increased sales tax, and discussions concerning the deterioration of wood in American automobiles. There was a mutually helpful association between the American chamber of commerce in Manila and the trade commissioner, who addressed that body monthly.

The trade commissioner aided the Hawaiian manager of a Pacific coast packing corporation in investigating the land laws of the islands with a view to leasing land for the cultivation of pineapples; gave advice regarding the placing of agencies in the islands; helped an American book company to regain business with the Philippine Department of Education; arranged confidential contacts for American representatives studying sales policies; and helped to introduce American kiln driers on coconut plantations. The trade commissioner was instrumental in reviving the Automobile Importers' Association of Manila. He spent his vacation period touring the Provinces south of Manila and studying the economic phases of the life of the people, using the information thus gained as the basis of subsequent reports.

The office at Batavia, Java, was opened in December, 1923. The establishment of contacts and sources of information did not preclude the preparation of several important major reports, which included an economic survey of the territory for 1923, two studies of the taxation system of the Netherlands East Indies, a detailed analysis of the islands' budgets over recent years, and a report on

the German application for a charter of Dutch New Guinea. The trade commissioner made a trip to Soerabaya, reaching the conclusion that the time is ripe for enlarging our markets in this territory through direct participation by American firms.

The activities of the bureau's office in India during the year consisted largely in laying a foundation for future activities. It has now been decided that, beginning with the fiscal year 1924–25, an office will be opened at Bombay, leaving at Calcutta a branch office under the direction of the main office at Bombay. A 10-week trip by an assistant trade commissioner during the early part of the fiscal year enabled the office to establish much-needed contacts and to assist in the establishment of American agencies as well as to gain first-hand information concerning the region around Simla, Delhi, and Allahabad. A trade commissioner made an extensive trip through India, Burma, and Ceylon, gathering trade information which he transmitted to the bureau in the form of special reports, cablegrams, etc.; several American agencies were arranged for, and the groundwork was laid for the establishment of many more.

The Calcutta office gave much aid to American branch houses in India, especially in connection with the Indian Stores Department, and also through general advice on advertising policies, credit information, sales methods, and market possibilities. Special investigations were carried out and others were started. Mr. Spofford was able to gather considerable material for a handbook of India, which he is working into shape as rapidly as possible.

Many satisfactory agency arrangements were effected by the bureau's Melbourne office. Confidential reports upon established agencies were made at the request of the American principals. Numerous investigations were carried out. Letters of introduction were supplied to Australian business men about to visit the United States, and appointments with Australian officials were arranged for American commercial travelers. The number of callers at the office has shown a gratifying increase. American automobile and tire exporters were aided on many occasions in the adjustment of tariff and other matters, besides being supplied with reports on various phases of the sale of their products in Australia.

FAR EASTERN DIVISION AT WASHINGTON

Such outstanding factors as the Japanese earthquake and the disturbed conditions in the interior of China made the informational service of the bureau's Far Eastern division especially important during the past year. The division has encouraged American exporters to take greater advantage of the opportunities in tropical Asia, from which we now obtain such a large share of our raw materials. The division's confidential circulars on economic conditions have been improved and enlarged. These statements, based on detailed reports from the bureau's field representatives, are mailed to business executives, bankers, credit men, and others actively interested in oriental markets. The most important trade information bulletin issued by the division was Japan After the Earthquake, which was placed in the hands of American business men just 30 days after the catastrophe.

The division has advocated the establishment in India and Malaya of joint selling organizations representing allied and noncompetitive lines of manufactured products, which organizations might profitably maintain buying departments for the raw materials needed in American industry. As a result of this campaign a group of New England manufacturers have taken steps to form such an organization.

The monthly cable service by which the division obtains up-to-date information from the foreign field has been extended to Batavia, Java, and Calcutta, India. American merchants in the Orient have received with enthusiasm the division's monthly cablegrams on conditions in the United States, and this service has been extended to the Dutch East Indies and India, in addition to China, Japan, and the Philippines. An innovation has been devised by which the bureau's district offices on the west coast of the United States contribute to this cablegram certain sections covering west-coast conditions, which are of particular importance to the Orient.

Special multigraphed circulars based on returns of trade of Far Eastern countries have formed a new feature of the division's work; "China trade, 1923," was issued four months in advance of the publication of the Chinese Maritime Customs returns. Monthly statistical analyses of United States trade with the Far East are also prepared and released for publication.

The Far Eastern Advisory Committtee, which cooperates with the division, now has seven members, an increase of two. Some of the questions handled by this committee during the year were those concerning China's debts and the proposed Peking conference for the increase of the customs revenue, European competition in the oriental Tropics, and similar problems. Weekly confidential summaries of political conditions have been distributed to the members of the committee.

Close cooperative relations have been established with the Philippine-American Chamber of Commerce and the China Society, both of which receive special services for their membership.

ACTIVITIES OF FIELD REPRESENTATIVES IN LATIN AMERICA

During the year about 1,500 American traveling men, bankers, and representatives called at the Buenos Aires office for information and aid. The office arbitrated many disputes, resulting in satisfactory settlements, and also assisted in the settlement of many important claims. Many connections between American firms and local agents were made. Traveling representatives of American concerns were assisted in many ways, even to the actual consummation of business. The office helped to obtain Government contracts for American firms, and aid was given in negotiations for national and municipal loans. Close attention was given to all tariff changes and classifications, Government loans and contracts, public works, and laws affecting American interests. The bureau was kept constantly informed concerning the pension law and the law fixing a minimum price for cattle and their effect on the economic situation in Argentina.

The Rio de Janeiro office was active in connection with various congresses held in Rio, and it also followed closely the activities of

different missions to Brazil from European countries. The office selected and invited the three Brazilian delegates to the Pan American Road Conference in the United States. The revision of the Brazilian tariff was closely followed. Customhouse difficulties of American firms were satisfactorily settled. The question of duties on certain agricultural implements was arranged. Assistance was given to an American firm in the matter of entering millinery samples into Brazil. The classification of automatic scales was arranged for an American firm. The office followed the enactment of the new Brazilian income tax law and the signed accounts law as to their effects on American trade. Assistance was rendered to several American automobile companies with respect to the establishment of agencies in Brazil, and valuable aid was given a representative of American manufacturers of street-sweeping machinery. Help was given to an American syndicate purposing to develop industries in northeastern Brazil. The office was also of great assistance to an American firm desirous of importing pottery into Brazil.

The Rio de Janeiro office aided in the sale of $200,000 worth of sugar machinery, assisted an American representative in the sale of large quantities of American fruits, was instrumental in sales of American flour, and assisted in the sale of coal to the Brazilian Railways. Through the office contacts were formed resulting in orders for American foodstuffs, automobiles, automobile accessories, hardware and tools, machinery, and other products worth many thousands of dollars. The Rio office arbitrated a number of claims involving nonpayments and insurance, attended to many customs claims, and successfully protested against certain customs regulations that operated to the disadvantage of American companies.

The office at Sao Paulo, Brazil, followed the coffee situation carefully as regards both the crop and the valorization activities of the Government. It cooperated closely with the members of the National Coffee Roasters' Association during their visit in Brazil regarding the standardization of coffee grades and arbitration of disputes. The trade commissioner made a trip as far south as Porto Alegre, State of Rio Grande do Sul, and prepared an extensive report on conditions in that region. He gave valuable aid to a representative of American road-building machinery by arranging with the State government for demonstrations of the machinery, and aided American automobile companies in the selection of agents. As chairman of the committee on agricultural extension of the American Chamber of Commerce of Sao Paulo he rendered important aid in the promotion of sales of American agricultural machinery. The trade commissioner helped American automobile and agricultural-machinery importers in connection with customhouse difficulties. He assisted various American companies in patent and trade-mark procedure. He also helped American manufacturers of silk machinery to introduce their product in Sao Paulo.

A conservative estimate is that American merchandise to an amount exceeding $100,000 was sold during the past year as a direct result of activities of the bureau's office at Santiago, Chile. The commercial attaché presented to the Ministry of Foreign Affairs, through the American ambassador, a memorandum pointing out the discriminatory nature of several clauses in the Chilean income-tax bill as reported by the senate committee, and as a result, these clauses

were redrafted and the discriminatory phrasing was eliminated. The office prepared various notes for business reviews, and in the leading British-American publication of the country considerable space was given to matter submitted by the bureau's office. The office aided Chileans seeking small purchases in the United States; articles bought included, among other things, a motion-picture machine, bathroom fixtures, a house-heating apparatus, etc. Several commercial disputes were satisfactorily adjusted. Representatives of other departments of the United States Government were aided. There was a substantial increase in the amount of work handled as compared with the previous year. The commercial attaché made an extended trip through southern Chile.

There was a greatly increased number of visitors at the Lima office, which was removed to a new and modern office building. Material assistance was rendered in settling a large number of disagreements between Peruvian and American firms. Arbitration was effected in a number of cases. Agencies for American goods were obtained through the efforts of the office. The bureau's monthly cable reviews, not only from Lima but from all of the countries of Latin America, are regularly republished in Peru. The report on the cotton industry of Peru was reprinted by the local press, both in the original and in translation, and has been widely and favorably commented upon.

The office at Bogota was opened September 1. Colombian affairs have been of deep interest to many American firms, especially with respect to railroad expansion. Valuable service was rendered to representatives of American firms endeavoring to obtain Government contracts. A contract involving more than $100,000 was secured by an American company when, without the timely intervention of the American commercial attaché, it would have gone to a European competitor. The office cooperated in the bureau's rubber survey, making a very thorough report on possible rubber lands in the Maracaibo Basin in Venezuela. Among the subjects covered by the 64 special reports from the Bogota office were the plans of the Government for railroad construction and public works and the character and activities of the Colombian coffee industry.

A noteworthy service inaugurated by the Habana office during the year was the monthly economic report, beginning in April, 1924. Labor conditions formed the subject of a detailed report by the commercial attaché. The passage of the Tarafa Railroad consolidation act and the decree prohibiting the wearing of yellow khaki were given attention; in the latter case a considerable saving to Americans was effected through the prevention of shipments and manufacturing. Numerous reports and special studies were prepared for other offices of the United States Government in Habana, and particularly for the ambassador with respect to the floating debt, liquidation of the banks, liquidation of the budget, and the immigration question. Delegates for the Pan American Roads Conference were obtained. Efforts have been made to extend the American automotive trade. The proposed Cuban tariff reform has been the subject of many inquiries. Two trade information bulletins on economic conditions in Cuba were written. Many commercial disputes were satisfactorily settled. Outstanding accounts were ad-

justed. Information was given which resulted in profitable connections for American firms.

Although the resumption of diplomatic relations with Mexico did not result in a big expansion of business, the renewed interest in the country greatly increased the routine work of the Mexico City office, which has been instrumental in many ways in developing American enterprise and settling trade disputes that might have resulted in loss of trade for the United States. Aid was given by the Mexico City office during the period of port strikes at Vera Cruz, and especially in connection with the losses sustained during the revolutionary disturbances. Valuable credit information was gathered and given to American exporters.

LATIN AMERICAN DIVISION AT WASHINGTON

As an example of the problems that engaged the attention of the Latin American division during the year—because of their effect on trade, investment, or the economic situation—the following may be mentioned: Resumption of diplomatic relations with Mexico; revolution and strike in Mexico; application of agrarian laws in Mexico; revolution in Honduras; earthquake in Costa Rica; reorganization of finance of Salvador; political disturbances and strikes in Cuba; Ecuadorean exchange; political disturbances in Rio Grande do Sul, Brazil; political disturbances in Paraguay; Bolivia's new tax legislation; Argentina's new pension law; Cuban legislation affecting railroads and ports; Mexican sisal situation; Chilean nitrate situation; Bolivian tin production; Brazilian coffee situation; European competition in Cuba; Chile's new income-tax law.

The division participated in the Pan American Roads Conference and in the work of the Department of Commerce in standardization of specifications and in the crude rubber survey. Cooperation was given the American High Commissioner to Haiti in his efforts to bring about a better economic situation in that country. The chief of the division has visited business centers in this country, addressing commercial bodies and conferring with business executives. In September, 1923, there was held in Washington a conference of commercial attachés at Latin American posts, the heads of four offices being present. A representative was maintained in Porto Rico for several months collecting material for a handbook on that island.

During the year 360 articles prepared by the division were published in Commerce Reports. Among the division's trade information bulletins were The States of Brazil; Economic Development in Argentina Since 1921; British Honduras; A Brief Review of Its Resources, Trade, and Industry; Cuban Economic Development; Honduras; Colombia; Commerce and Industries, 1922 and 1923; United States Trade with Latin America in 1923. Of the 23 mimeographed circulars issued by the division the following titles may be mentioned as representative: "Suspension of payments of Mexican Government drafts," "Pernambuco needs American sales agents," "Principal crops of Ecuador," "The outlook in Brazil," "Effects of Honduran revolution on the north coast," "Mexican exports to the United States in 1923," "Birth and death rates in Latin America," "Competition in Argentine import trade."

Late in the fiscal year the division inaugurated a weekly mimeographed circular entitled "Latin America at a glance," comprising items which, gathered from all sources and grouped geographically, afford a brief and significant survey of conditions. The circulation has risen to more than 8,000 copies. This service is supplemented by a weekly news letter to district-office managers, giving confidential information omitted from the circular and inclosing copies of special reports or of charts, tables, maps, etc.

COMMODITY DIVISIONS

FUNCTIONS AND SERVICES COMMON TO ALL COMMODITY DIVISIONS

As was the case last year, each of the bureau's 17 commodity divisions has supplied material for a special section in Commerce Reports, the weekly magazine of the department; distributed numerous special circulars; prepared articles for trade journals; sent out data on trade opportunities; increased the number of names on the bureau's Exporters' Index; prepared questionnaires to be answered by Government representatives abroad; and cooperated with committees of trade associations or other representatives of American industry. The commodity, like the regional, divisions have aided in the preparation of material for the Commerce Yearbook.

AGRICULTURAL IMPLEMENTS DIVISION

The principal contact of the agricultural implements division has been with the National Association of Farm Equipment Manufacturers. A very beneficial conference at Washington on bolt and nut standardization, in which the members of the association took a leading part, was largely the result of the division's efforts. The number of inquiries handled directly by the division increased from 2,067 in 1922–23 to 2,720 in 1923–24. The demands for export and production statistics are increasing. In many specific instances the services of the division brought concrete and highly satisfactory results. For example, through the efforts of the bureau several American tractor manufacturers have made very satisfactory agency connections in Australia, sales totaling $15,000 resulting in one case within a short time. During the year 128 trade opportunities were handled by the division, covering a wide variety of implements and coming from many different countries. Many articles were prepared for Commerce Reports. Typical titles are "Condition of British implement industry," "Use of carriages and wagons in Yucatan," "Interest in sanitary dairy equipment in South Africa," "French tractor trials favor American makes," "Agricultural implements in use in Finland," "Condition of Czechoslovak implement industry," and "Use of hand tools in Japan." A trade information bulletin, entitled "German Agricultural Implement Industry and Trade," by Assistant Trade Commissioner Ernest M. Zwickel, was published during the year, and a study of the market for agricultural implements in Ireland, by Assistant Trade Commissioner William M. Park, was published in the form of a special circular. The reports resulting from the questionnaire on foreign markets for

windmills were distributed in the form of special circulars. Questionnaires were sent out during the year on foreign markets for tractors and tractor implements, incubators and brooders, lawn mowers, and farm engines; many of the replies are now being received. The monograph on Agricultural Implements and Farm Equipment in South Africa, by Trade Commissioner Perry J. Stevenson, which was a revision of Special Agents Series No. 146, published in 1917, was very favorably received by the trade. It is planned during the coming year to revise the monographs on the same subject covering Argentina and Australia.

AUTOMOTIVE DIVISION

The automotive division has greatly expanded its contacts and participated largely in sales activities. The division at Washington answered, by letter or personal contact, 9,027 inquiries during the fiscal year 1924, against 7,597 during the previous year. A complete file of catalogues of American manufacturers was begun by the division. Application blanks for "Manufacturers' export representatives or export managers" and "Positions with automotive manufacturers and exporters" were prepared, and many were filled out by applicants and filed in the division. The chief single enterprise of the division during the year was the inaugurating (in cooperation with six leading trade associations) of an Automotive Foreign Trade Manual, consisting of a loose-leaf binder and geographical index, for which new sheets of information from all automotive markets of the world are issued on a weekly mailing schedule. At the end of the fiscal year 551 pages had been issued, covering basic information on most countries and containing current merchandising data of great value. The manual now has about 400 subscribers.

The entire automotive section of the Exporters' Index was revised, insuring that firms will receive exactly the services most useful to them. A "Glossary of automotive products" was prepared, to be issued in booklet form. It will contain alphabetical and numerical lists of all automotive products exported, together with facsimile copies of properly executed shippers' export declarations.

To provide Government representatives with a comprehensive list of subjects in which the division is interested, an "Instruction outline" was prepared. Arrangements were made to secure monthly cablegrams from leading foreign countries, giving current data on imports, production, and market conditions. A series of questionnaires were sent to the foreign field, and the resulting reports were widely disseminated. Among these were "Storage batteries, electrical vehicles, and electrical servicing facilities;" "Selling seasons;" "Markets for accessories;" "Service-station equipment and unit assemblies;" "Exhibitions and contests;" "Motor cycles;" "Aircraft;" and "Quarterly sales survey." Arrangements were made to secure separate figures for foreign assemblies of American cars. Reports on retail gasoline prices in foreign countries were obtained. Among the 214 special circulars sent out the following titles may be mentioned as typical: "American motor busses wanted in Netherlands;" "Danish interest in American airplanes;" "Japan: Earth-

quake results in demand for low-priced cars and trucks;" "World registration of automotive vehicles, 1923;" "Spanish company desires to purchase 107 busses."

Contributions to Commerce Reports averaged more than two full pages weekly. A "Line digest," giving advance information on Commerce Reports articles, was sent out every week to 1,700 automotive firms. A press statement was issued every week. Many special articles were prepared for newspapers and trade journals. Two special studies, entitled "Survey of fire-fighting equipment in foreign countries" and "Foreign makets for taxicabs and taximeters," were prepared in manuscript and loaned to many firms. A monograph on Automotive Markets in Argentina, Brazil, and Uruguay, by C. J. P. Lucas, was prepared for publication. Hundreds of exhibits including catalogues, programs of automotive events in all countries, specifications and blue prints of automotive apparatus, and special reports were sent to inquirers.

Various important conferences and meetings were held by or in cooperation with the automotive division, and very substantial results were obtained. The chief of the division addressed numerous trade bodies. Throughout the year the division has directed the training of students, sent by the Egyptian Government to this country, in American automotive plants. Numerous foreign visitors have been furnished with information regarding the American automotive industry. Many representatives of American manufacturers have visited the division to obtain facts and advice in planning foreign sales trips. Notable dollars-and-cents results have been achieved through the division's services.

CHEMICAL DIVISION

The volume of work of the chemical division has steadily increased; outgoing letters totaled 6,118, telephone calls numbered more than 2,000, and 266 visitors were received. The organization of informational material and the building up of reference files have gone on continuously. The division's contacts have been chiefly through trade associations, of which there are about 35 directly within the field of the chemical industry and as many more interested in allied industries. The division was represented by speakers at a number of important association meetings. Effective dissemination of data has been accomplished through Commerce Reports. A special mimeographed weekly known as the Chemical Trade Bulletin was inaugurated in October; items are segregated into five separate sections, for each of which there is a separate mailing list.

The special monthly service on dye imports, begun by the division in January, 1923, in conjunction with the chemical section of the Tariff Commission, has been continued, extended, and improved. During the course of the year a similar periodic service at three-month intervals was begun, covering biological chemicals and stains.

Trade information bulletins issued by the division have included Chemical Trade of Japan (prepared after the earthquake); The Swiss Dyestuffs Industry; Market for Prepared Medicines in Brazil; Foreign Markets for Paints and Paint Materials; Markets for American Pharmaceutical, Medicinal, and Biological Preparations; the German Coal-Tar Chemical Industry; The German Alkali and Sul-

phuric Acid Industries; British Dyestuffs Industry; and Italian Dyestuffs Industry. In addition the division has two monographs in the miscellaneous series bearing the titles "China Wood Oil" and "German Dyestuffs Industry."

Of the 35 special circulars sent out only a few subjects can be mentioned: "World résumé of the paint situation"; "The German aniline dyestuffs cartel"; "Potash in Czechoslovakia"; "Fertilizers in Ireland"; "Data on camphor"; "The Bulgarian attar-of-roses industry."

The special study of the dye and organic-chemical situation in Europe, by F. E. Breithut, has been productive of very significant results. Mr. Breithut visited England, Germany, France, Italy, Switzerland, Austria, Poland, and Belgium, and a series of trade information bulletins on those countries will be issued.

A number of special articles have been written at the request of trade publications.

A special monthly cable service has been devised, whereby statistics with respect to China wood oil, showing stocks on hand and in transit from the interior, as well as sales, prices, and crop forecasts, are received each month and transmitted to interested American firms.

The division had exhibits at the Textile Exposition in Boston and at the National Laundry Owners' Exposition at Providence, the object being to indicate the reliability and value of American as compared with foreign dyes.

Work has been undertaken looking to simplified practice in the drug industry. The division has supplied to foreign representatives of this Government more than $3,000 worth of books on chemical subjects (provided gratuitously by publishers and organizations). Through the direct assistance of the division a number of agency agreements have been established by American firms in such items as medicinal preparations, toilet articles, paints and varnish, turpentine, and rosin. Several large individual transactions were fostered, notable among which was the sale of 60,000 tons of coal-tar pitch to British interests (this being followed by other sales), 200 tons of pine oil to European interests, and 40,000 gallons of denaturing wood alcohol to Argentina.

COAL DIVISION

The coal division was reorganized in September, 1923. Two reports are issued monthly—one giving a General Survey of Conditions in the Coal Industry of the United States and the other giving a summary of the Export Coal Situation. These are distributed to a list of more than 400 names. Sixty-six special circulars have been issued during the fiscal year, covering market conditions, production, imports, exports, and consumption in foreign markets. At the request of the division various branches of the coal industry and the coal-carrying railroads have appointed representatives on a permanent committee advisory to the coal division.

The division is engaged in compiling material for an exporters' manual or handbook, to show conditions in the principal foreign markets, as well as the movement of American coal to all foreign countries, the characteristics of our principal export coals, facilities

for handling coal at our principal ports, and other information of interest and value. In addition, current statistical tables are maintained, showing production in the various States and the principal movement of coal for export, coastwise, via the Lakes, and to New England. Current statistical information is also maintained on spot mine prices, ocean charter rates, and the production, imports, and exports of the principal foreign countries producing and consuming coal. Special confidential information regarding foreign trade opportunities is sent to a list of 216 exporters.

During the year 1,591 letters were answered, as compared with 770 letters in 1923.

ELECTRICAL EQUIPMENT DIVISION

Through the special committee of the Electrical Manufacturers' Council, appointed to advise with the bureau's electrical equipment division, this division continued its close contact with the industry. It has also been regularly in touch with the Electric Power Club, the Society for Electrical Development, and several radio organizations, as well as individually with telephone manufacturers. In connection with domestic questions, the division has also been in contact with the National Electric Light Association and the Committee on the Relation of Electricity to Agriculture.

Work was continued on basic material that is regularly called for, such as information concerning wiring practices abroad, export and import data, revision of central-station directory for various countries, and the like. The routine requests for information have increased from 2,536 in the fiscal year 1923 to 3,347 in 1924, mainly because of the great interest in radio.

Certain changes in the classification of electrical exports were arranged for and a revision of the Electrical Glossary was carried out. Special circulars issued by the division during the year numbered 129. The division has helped many manufacturers in securing efficient representation in foreign markets. It has continued to study the activities of firms handling electrical goods in various markets, as reported in foreign technical journals. Much information was sent out giving details of direct prospects for selling goods. One company writes that as a result of reports published by this division in Commerce Reports it has marketed its product in every country of the world, and it states that a list of prospects furnished by the division secured from a foreign buyer the largest order that company had ever received.

Specifications obtained from abroad and distributed to American manufacturers have included those inviting bids on a telephone exchange in Latvia, high-tension insulators in Australia, street-car equipment in South Africa, power plants in Egypt, telephone equipment in Australia, an electric-light plant in Mexico, insulated wire in Australia, etc. The division has continued to function as American sales agency for specifications issued in connection with the Morwell Power Scheme in Australia. Contact has also been maintained with large construction companies, and possible opportunities for them to design and build large engineering projects in foreign countries have been currently transmitted to them.

A special survey was made of the market in all civilized countries for American radio equipment, the replies to a questionnaire being

sent out to the trade in the form of special circulars. Similar surveys in other lines were handled in the same manner.

Catalogues of some of the European manufacturers were obtained and circulated among American manufacturers. In the domestic field an analysis of the relative importance of various sales districts in the United States as markets for electrical lines was carried out. In conjunction with the Geological Survey, the division obtained late statistics on the number of electric-light consumers in the United States.

FOODSTUFFS DIVISION

The total mail received by the foodstuffs division for the past fiscal year was 34,016 pieces. There were 901 visitors and telephone requests. There were 8,216 reports from the foreign field received and disposed of. Outgoing correspondence totaled 8,173 letters.

At the request of cooperative tobacco associations several conferences were held as to how these organizations might improve the marketing of their products abroad. Conferences have been held a number of times with representatives of the Pacific coast dried and fresh fruit industries, who desire more information on the competing products in the Mediterranean region. Recently John H. Hynes has been chosen to cover this district (with headquarters at Rome), making special reports on citrus and deciduous fruits, as well as nuts.

The California Packing Corporation and the Sun-Maid Raisin Growers have followed the lead of the Rice Growers' Association of California in appointing representatives to be located at Washington in order to make greater use of the special reports of this department.

There has been a comprehensive study of the production, marketing, and distribution problems of the Pacific coast and competing territories. H. B. Smith was appointed as special representative of the division in Europe to report on the foodstuffs trade and on crop conditions; he is furnishing regular reports.

Among the many specific sales results brought about by the division there may be mentioned, first, the case of a large concern which the division helped in establishing its product in Cuba and which is now taking in about $700 a day, with the business rapidly increasing. As a result of a trade opportunity about 1,000 hogsheads of tobacco were sold by three large exporting firms. The bureau was also instrumental in securing a large order from a government monopoly for an American tobacco firm. Through the efforts of the division a contract was closed which gives American growers the privilege of supplying the Polish Tobacco Monopoly for 20 years with 60 per cent of its leaf-tobacco requirement.

Three publications have been issued during the past year—World Trade in Vegetable Oils and Animal Fats, Chicle and Chewing Gum, and European Economic Conditions Which Affect the Markets for Agricultural Products. The following publications are in process of being printed or are in preparation by the division: Rice Trade of the World, Tobacco Trade of the World, Markets for Canned Foods in the Western Hemisphere, Markets for Flour, Export Meat Trade and Practices, World Statistics on Meat Trade, Handbook of Coffee Statistics, Nonintoxicating Beverages in Latin America, International Movement in Dairy Products, Markets for Canned Foods in

Western Europe, Foreign Markets for Confectionery, Brazil Nut Industry.

The division now has six regular press statements which are issued weekly or semimonthly, as follows: "Foodstuffs 'round the world"; "World trade and crop notes"; "Foreign notes on meats, fats, oils, and livestock"; "Fishery news service"; "World dairy and poultry notes"; "Confectionery foreign-trade notes." Other reports and items are released from time to time.

Inquiries, questionnaires, and cable requests sent during the year by the foodstuffs division to the bureau's foreign representatives and to the Consular Service numbered 159, covering a great variety of subjects.

HIDE AND LEATHER DIVISION

There has been a substantial increase in the amount of work handled by the hide and leather division. For four months the work was centered on the development of sole-leather markets in the Orient, while for the past half year the attention of the division has been focussed on eastern and central European markets for American upper leather. The results have been most gratifying; there have been noteworthy increases in exports to these countries.

Complete estimates have been published of the world's available stocks of cattle hides, calfskins, sheepskins, and goatskins. A cable service from Buenos Aires was instituted, giving monthly the figures of production of "frigorifico" hides in Argentina and Uruguay, and estimates of stocks on hand. The industry has been supplied immediately with the replies to questionnaires regarding livestock and production of hides and skins in all parts of the world.

The division has assisted in the study of certain defects in frigorifico hides which have been the cause of substantial loss to tanners. The movement for the improvement of raw hides and skins in many parts of the world has been carefully followed and reported to the industry. The work of cooperation with the owners of reindeer herds in Alaska has continued, a study of the domestic market for reindeer skins has been made, and a study of foreign markets is now in progress. The division has received reports on the leather industry and the market for American leather in Spain, Turkey, Italy, Greece, Czechoslovakia, Germany, Austria, the Netherlands, and China. For banks and industrial engineers a vast amount of work has been done with respect to the general economic situation in the leather industry at home and abroad. The hide and leather division has cooperated with former Trade Commissioner Norman Hertz in the preparation of an up-to-date survey of the hide and leather industry of Great Britain. This is now in the hands of the printer and will soon be published as a monograph.

During the year 1,636 requests for information and assistance which required extended research were answered, an increase of 34 per cent. In addition, the division has aided 307 visitors, and members of the staff have consulted with 302 firms outside of Washington.

During the year 144 special circulars were distributed, an increase of 220 per cent as compared with the previous year. The wide range of subjects is indicated by the following titles, picked at random:

"Germany's consumption of hides and skins," "Fancy-leather industry of Austria," "British leather production," "New labor-saving device for treatment of hides," "Market for sole leather in Shanghai." Notifications of 200 selected trade opportunities were published, and in many instances, as a result of these, members of the industry have established with foreign agents and buyers connections that promise to be most profitable.

There were sent out during the year 58 questionnaires relating to foreign raw stock and 43 relative to production of foreign leather and markets for American leather abroad. Two questionnaires relating to tannning materials were sent out to the domestic trade. The informational files of the division have more than doubled in size and value.

INDUSTRIAL MACHINERY DIVISION

During the last 12 months the work of the industrial machinery division has increased considerably. On the 1st of June the chief of the division started on a European investigation trip, to last several months. The number of machinery inquiries handled by the bureau showed an increase of more than 60 per cent as compared with the preceding year. Visitors at the division in Washington numbered 217, including many leaders in the American industry, and also many foreigners, who were assisted in the missions that brought them to this country.

Comprehensive data concerning individual machinery dealers throughout the world have been supplied in many instances. Manufacturers made many demands on the division's extensive file of foreign steam-boiler regulations. The division furnished to American trade journals articles of real value, such as those recounting achievements of American machinery manufacturers abroad in the face of keen foreign competition. Much attention has been given to foreign students, particularly engineering, in the United States. The division has cooperated with the American Engineering Standards Committee in connection with Pan American standardization and also in relation to publishing a proposed engineering glossary in Spanish, Portuguese, and English. A number of improvements have been introduced in the classification of industrial-machinery exports. Much information was collected and disseminated concerning highway construction abroad. Considerable time was devoted to a large and important delegation representing 17 Latin American Republics, invited to the United States to study our methods of road construction, equipment employed, etc.

There has been turned over entirely to this division the handling of "construction news"—preparation of material for Commerce Reports, advertising of calls for bids, answers to inquiries, etc.

Six trade information bulletins were published: Promoting American Machinery Sales Abroad; Industrial Machinery Trade of Italy; Value of Machinery Export Statistics; 1924 Plans for Machinery Exports; Ice-Making and Cold-Storage Plants in South America; and Ice-Making and Cold-Storage Plants in Mexico, Central America, and the West Indies. Many other special studies were made, their general character being indicated by the titles "American designs copied abroad," "Italian machinery industry and trade,"

"What is your export ratio?" "British machinery competition," and "Machinery exports to Mexico and Central America." Mimeographed circulars were sent out to the number of 134, covering such subjects as "Dairy and refrigerating machinery exhibitions at Buenos Aires." "Estimates requested for citric-acid plant for South America," "Advertising in India," "Industrial-machinery trade in Trinidad," "Steam-boiler regulations in Tokyo," and "Foreign competition in machinery markets."

IRON AND STEEL DIVISION

Commerce Reports has been the principal vehicle for the distribution of data by the iron and steel division. Special articles were prepared, also, for trade journals and the press. Trade information bulletins issued by the division have included The British Steel Industry; Trade Organizations in French Metallurgy; Italy's Foreign Trade in Iron, Steel, and Nonferrous Metals; Magnesite: Commercial Sources and Trade; International Trade in Cement; and World Survey of the Zinc Industry. Material for similar bulletins relating to foreign production and trade in chrome, aluminum, and bricks has been collected and assembled. Of the division's special circulars 100 have related to British and continental activities in iron and steel items, 50 were devoted to individual foreign markets for roofing materials, while the remainder dealt with miscellaneous subjects such as iron ore, wire, cement, and specific trade opportunities. Toward the close of the year a weekly trade letter was inaugurated which reviews European iron and steel production and trade.

Questionnaires sent out by the minerals section covered (for exporters) roofing materials, tin, lead, and aluminum foils, and refractory cement and (for importers) foreign sources of manganese ore, bauxite, magnesite, graphite, mica, asbestos, quicksilver, and platinum. On behalf of the domestic cement manufacturers, the mineral section inaugurated an exhaustive survey at home and abroad to learn the extent of foreign production and trade with this and other markets. The vast amount of data collected appeared in a three-part bulletin, entitled "International Trade in Cement," which has been called for in unusual numbers.

The chief of the division and his two assistants visited most of the manufacturing and exporting centers of the East, South, and Middle West, conferring with exporters. The number of visitors to the division at Washington more than trebled as compared with the preceding year.

Among specific examples of the studies made by the division during the year for the benefit of exporters, the following may be mentioned: Outline of foreign markets for the sale of steel reinforcement materials; leading markets for steel transmission towers, possibilities of exporting steel barrels and drums; prospective world trade in portable steel buildings; bridge, building, and railway construction in many parts of the world brought to the attention of interested firms; establishment of contact with foreign buyers for American manufacturers of wire netting, drop forgings, and other steel articles; world-wide survey of requirements for screws and bolts.

The chief of the division gave technical and trade advice and assistance to local representatives of a foreign government in the purchase from American manufacturers of large quantities of steel construction materials. He was also particularly helpful to American exporters after the earthquake in Japan, because of his intimate knowledge of the country and its engineering requirements. Since October one of the assistant chiefs of the division has been secretary of the Department of Commerce Committee on Standardization, the work involving interviews, conferences, committee work, and correspondence in large volume.

The year 1924 witnessed greatly increased activity in foreign construction undertakings of all kinds requiring large tonnage of steel bars, shapes, and plates, sheets, wire products, piping, builders' hardware, cement, asphalt, roofing materials, and miscellaneous items falling under the "minerals and metals" classification. The most important of these were advertised in Commerce Reports, but a large number requiring quick action and special treatment were distributed by the division to those firms known to have a particular interest in the specific work and the field of operation. Among these were included terminal buildings and bridges for Egypt; steel bridges for Canada, Australia, India, and China; reinforced concrete bridges for Brazil, Argentina, and Uruguay; waterworks involving cast-iron and steel piping for South Africa; grain elevators for Canada; docks and wharves for a number of European shipping ports; street paving in Java; and railroad construction in Mexico and other Latin-American countries.

Hardware, closely allied to iron and steel, was made an added activity of this division, the transfer from the specialties division being effective May 1, 1924. Returns in response to a general hardware outline are coming in from the foreign field force. Much of this information has been circularized among interested hardware firms, while the bulk of it remains in the division as "background material."

LUMBER DIVISION

On July 1, 1923, the chief of the lumber division sailed for Europe for 15 months' work investigating the lumber markets of western Europe. Detailed studies were made of the markets of the Netherlands and France, and the Netherlands monograph was completed and sent to the printer. In the fall of 1923 the staff in Washington was called on for considerable assistance to the Japanese Ambassador and our northwestern lumber trade in connection with the purchase by Japan of about 100,000,000 feet of northwestern lumber; the inquiry, with complete specifications, was released simultaneously through the bureau's district offices at Seattle and San Francisco. During the year the trade lists covering lumber agents and importers in practically all lumber-importing countries have been revised and brought up to date, and in this connection a lumber-agency "clearing house" has been built up; 89 agency connections were recommended to lumber exporters during the year.

Information obtained from 1,217 exporters is carefully indexed for mailing-list purposes and was used by the division in sending out each of the 114 confidential circulars and 20 circular letters

issued during the year to those firms interested in the particular wood or product under consideration.

Some time ago the division inaugurated, through a questionnaire, a survey of foreign box-shook markets. The results of this investigation have been brought to the attention of the industry by means of numerous circulars.

The last of the important and extensive series of trade information bulletins on Methods of Handling American Lumber Imports Abroad—this last number being the report covering Asia—was prepared by the lumber division during August, 1923. Other trade information bulletins included Forest Resources of Central Europe and Austrian and Czechoslovakian Lumber and Woodworking Industries. The cooperage market abroad was covered in Miscellaneous Series No. 118, Stave Trade in Foreign Countries. The division arranged with the trade commissioner at Manila to prepare a comprehensive report on Philippine woods in cooperation with the Philippine Bureau of Forestry. This report was received in manuscript form shortly before the end of the fiscal year 1924. Many articles were contributed to Commerce Reports and much additional material was released directly to lumber trade journals.

A total of 6,695 business problems and questions were handled during the year by the lumber division. The division has been of increasing service to lumber exporters going abroad. The lumber division has cooperated with the commercial laws division in helping to settle disputes between foreign importers and American lumber exporters. The division has continued to be in close touch with associations in the lumber industry. In April a member of the division addressed meetings in New Orleans, Memphis, Jacksonville, Savannah, Atlanta, and Mobile.

With the cooperation of the statistical division, monthly statistics are issued covering the exports of lumber and wood products by species, customs districts, and countries of destination. The division has been instrumental in having the classifications made more comprehensive. Also, foreign statistics of the trade in lumber and its products have been compiled and interpreted.

The principal lumber-trade journals of the United States and other countries are received, reviewed, and indexed. Important forestry publications, as well as new books on lumbering and forestry, are reviewed. The division keeps in close touch with developments in forestry, standardization of lumber grades and sizes, tests of wood products, improved methods of manufacture and utilization, etc.

PAPER DIVISION

There was an increase of about 25 per cent in the number of inquiries relating to paper that were answered by the bureau. Much of the division's time was taken up in an endeavor to assist American producers in fighting European competition in the United States market. Conferences were attended in Washington, New York, and Chicago. The division has made a study of the production of pulp and paper in the principal European producing countries. Another important matter taken up by the division was the collection of samples of the various grades of waterproof case-lining paper made

in the United States for the purpose of testing and developing a standard specification for inclusion in the transportation division's manual on export packing. The Bureau of Standards made the tests. The division also assisted the division of simplified practice in its program for elimination of waste in the paper industry.

Trade information bulletins were published discussing the markets for paper and paper products in Chile and Peru, in Mexico, and in Cuba. A supplementary study was made in Mexico to obtain facts relative to German competition on special grades of paper, the results being published in Commerce Reports.

At the request of a large producer of waxed paper and candy wrappers, special lists giving the names and addresses of possible agents in the most important consuming centers of the world, were furnished. Similar services were rendered to other manufacturers. Through information furnished by the commercial attaché at Tokyo two large manufacturers of printing equipment were induced to send representatives to Japan to take advantage of the need for replacement of equipment destroyed by the earthquake. The patentee of a new material used in paper making was aided in the disposal of his patent rights in England. A large manufacturer was given special assistance in connection with the opening of an office in Shanghai. The division was instrumental in helping another large corporation to overcome difficulties in connection with a foreign government contract. Further revision of trade lists was taken up. The special monthly statistical service was expanded.

A few of the more important articles published in Commerce Reports were "Analysis of the United States paper exports during 1923," "The newsprint paper industry of the United States," "Exports of paper from United States during first quarter of 1924," and "Canadian pulp and paper exports in 1923." The report of paper exports from the United States published each month in Commerce Reports was continued through 1923–24. Numerous reprints of articles published in the "Paper" section of Commerce Reports appeared from time to time in newspapers and trade journals.

PETROLEUM DIVISION

During the summer of 1923, because of the overproduction of crude petroleum in the United States, a large number of requests were made on the petroleum division for assistance in disposing of both crude petroleum and petroleum products abroad. The division has constantly pointed out to the trade the importance of allotting a certain portion of the domestic production for export.

Specialized statistical data were prepared on specific requests from various oil companies, as well as for general distribution. Compilations of the petroleum trade statistics of individual countries were made, as well as special compilations of United States statistics in cooperation with the statistical division. In cooperation with the commercial intelligence division trade lists were improved and a considerable number of new lists prepared. The chief and assistant chief of the division attended the First Annual Petroleum Exposition and Congress at Tulsa, Okla., in October, and visits were made to some of the leading exporters in that territory.

The special "country lists," which were begun the preceding year, by which information was obtained as to the particular countries in which each American exporter is interested and the special products manufactured, were extended and proved of increasing value. Among the 90 special circulars issued the following may be considered representative subjects: "Germany's supply of petroleum and allied products"; "The outlook for petroleum trade of France"; "South China market for paraffin wax"; "Taxes on petroleum and petroleum products in Mexico"; "Egyptian Government general specifications for oils"; "Petroleum consumption in Japan, 1923." A series of reviews covering the petroleum trade of the principal foreign markets during 1923 and the outlook for 1924 was prepared by the bureau's foreign offices and published partly in Commerce Reports and partly in special circulars. Several series of periodical circulars were begun, such as the "Monthly petroleum shipments from the Tampico district, Mexico"; "Monthly imports and prices of petroleum products in Argentina"; "Monthly reports on the petroleum market in Belgium"; similar reports for Italy and other countries, etc. Representative Commerce Reports articles covered "A review of petroleum developments abroad during 1923," "Kerosene trade of the Orient," "American petroleum export trade during 1923," and "The current tread of German petroleum trade."

To the series of trade information bulletins were added surveys of the petroleum industries of Poland, of Peru and Ecuador, and of Japan. A survey on the industry of Russia was also completed, to be published after the close of the fiscal year.

A total of 142 trade opportunities for the sale of American petroleum products abroad were handled by the division during the year. The great value of this service is demonstrated by the notable concrete results that have been reported by various firms. The division at Washington replied to 3,134 inquiries during the fiscal year.

The division has begun the preparation of a series of commodity surveys covering the market for gasoline, kerosene, lubricating oils, and other individual petroleum products throughout the principal countries of the world. The special statistical service of the division is being constantly improved and expanded. Special attention is being given to the revision and expansion of trade lists in cooperation with the commercial intelligence division. A periodical price-information service has been inaugurated, one feature of this being a quarterly report on gasoline prices in all principal foreign markets.

RUBBER DIVISION

The work of the crude-rubber section of the bureau's rubber division is mentioned under the heading "Investigations of raw materials."

Current information regarding foreign markets for rubber products was given to the trade chiefly through mimeographed special circulars, the mimeograph equipment having been furnished especially for the division by the rubber industry. The number of circulars issued was 313, as compared with 168 in the fiscal year 1923 and 52 in 1922. In Commerce Reports there have been monthly presentations and interpretations of American export figures, while other articles contributed to the weekly magazine included such titles

as "World export trade in rubber and balata belting," "Market for hot-water bottles in Great Britain," "The Japanese tire market," "French exports of rubber products," and "Possibilities of expansion in American golf-ball trade." The division gave personal service to inquirers in about 4,000 cases during the fiscal year.

The division continued its practice of offering special cooperation to the division of statistics in the preparation of monthly, semiannual, and annual statements of rubber exports from the United States, these statements being distributed in mimeographed form long before they appear in print. The number of classes of rubber products separately reported upon was increased during the year. Early in 1924 the division prepared a trade information bulletin, The Use of Statistics of Rubber-Goods Exports, which gave directions for the correct preparation of export declarations, explained the statistical system, and contained a glossary. During the year regular issuance of statistical statements of imports of automobile tires and golf balls was undertaken.

The division has supplied in definite order, through its system of "export handbooks," the basic information affecting the importation of rubber goods into foreign markets. In the year just ended the service was completed in 58 handbooks. In all, 74 countries are treated.

Trade information bulletins other than the one mentioned above were: Austrian Trade in Rubber Products, The Market for Rubber-Soled Footwear in China, and Export Trade in Rubber Footwear.

The work of preparing schedules showing the tariff rates applicable to rubber goods imported into foreign countries was continued during the year under the direction of an employee furnished by the Rubber Association of America. Schedules have now been distributed for every rubber-goods market of any importance. The rubber division has also continued its interest, in cooperation with the commercial intelligence division, in the preparation and distribution of lists of foreign importers of rubber products.

In March, 1924, the chief of the division went to Brussels, Belgium, to confer with rubber growers and manufacturers in attendance at the Sixth International Rubber Exposition and to assist with the exhibit of the Rubber Association of America. He subsequently reviewed the tire trade in Belgium, France, and England before returning to the United States in May.

Other special work included cooperation in a successful movement to bring about the rescinding of special marking requirements for rubber goods entering Denmark. Attention was also given to unfavorable tariff situations in Cuba, Spain, and British South Africa. Special informational campaigns covered canvas rubber-soled footwear and druggists' rubber sundries.

In October, 1923, the division welcomed a committee of foreign sales managers from the rubber industry who came to Washington to become better acquainted with various divisions of the bureau, and in particular to review the work of the rubber division.

SHOE AND LEATHER MANUFACTURES DIVISION

During the fiscal year 1923 the shoe and leather manufactures division sent out 15,602 pieces of mail (including general corre-

spondence, circular letters, etc.), an increase of nearly 25 per cent over the preceding year.

In December, 1923, the division compiled and the bureau published a trade directory containing names and addresses of 990 exporters of leather manufactured goods, specifying the kind of product manufactured—boots and shoes, gloves, belting, etc.—also whether the firm is a manufacturer and exporter or an exporter only. A supplemental directory is contemplated which will contain 496 additional names. A special mailing list was prepared segregating principal articles of export but including those less frequently called for. This list has been of great assistance in the prompt dissemination of opportunities to augment foreign trade.

Boot and shoe manufacturers engaged in extensive foreign trade were requested by the division to send illustrated catalogues with price lists to all the bureau's foreign offices. This has resulted in a good deal of profitable business. Through the efforts of the division several important business matters were amicably adjusted. Manufacturers were aided in their foreign trade-promotion efforts, and very substantial results were achieved in numerous instances.

Many analytical statistical statements have been prepared for manufacturers, bankers, students, lawyers, editors, and others, as well as articles for publication in Commerce Reports, newspapers, and trade journals. Through an arrangement made by the division with the National Boot and Shoe Manufacturers Association and the New England Shoe and Leather Association the 245 circulars prepared by the division and distributed to the industry were mimeographed and mailed without expense to the bureau. These circulars included such titles as "Increase in exports of leather boots and shoes," "Conditions in the Netherlands shoe market," "Swedish market for saddles and accessories," "Market for wardrobe trunks in South Africa," and "Imports and exports of leather gloves." The division also issued two trade information bulletins covering the boot and shoe industry and trade in South Africa and in Australia.

Through the cooperation of the division of statistics export data concerning a number of additional articles—shoe findings, bags and suitcases, shoe polish, etc.—are now given to the public each month in mimeographed circulars.

The chief of the division attended conferences of the industry in New England, New York, and the Middle West. He has maintained close contact with committees of nine trade organizations, as well as with individual manufacturers, to whom advice has been given as to the selection of potential foreign markets, methods of effective distribution of products, and sales promotion abroad, in addition to information regarding immediate foreign markets.

SPECIALTIES DIVISION

The specialties division handles about 20 major groups of commodities, some of these being business equipment, furniture, ceramics, sanitary ware, musical merchandise, jewelry, sporting goods, motion pictures, photographic goods, toys, and professional and scientific instruments. One of the important phases of the work is the grounding of the small manufacturer, inexperienced in export trade, in the elements of exporting. This may be called a merchandising service.

A direct sales service is also provided, giving definite assistance to large exporters in finding foreign outlets for their products. Foreign markets are studied. Surveys of various industries are made with regard to production, quotas allocated for foreign trade, and competing industries abroad. Up-to-date information on foreign advertising mediums and methods is kept on file. The results of all these services have been very gratifying; both large and small manufacturers have benefited materially.

World trade surveys were made during the fiscal year covering athletic and sporting goods, furniture of all kinds, jewelry, ice and roller skates, portable typewriters, and hardware. Plans are being made for other world surveys of this nature, and a survey covering the field of scientific and professional instruments, including hospital supplies and similar lines, is under way. Special market studies were made covering fountain pens, awnings and porch shades, motion pictures, tinware, office and school supplies, office equipment, amusement devices, playground equipment, and other specialties. A brief survey of permanent industrial expositions abroad was made. A special study of the German toy industry was carried out.

Trade information bulletins issued by the division included Office Supplies in Brazil, The European Market for Sporting and Athletic Goods, Market for Athletic Goods in Canada and Newfoundland, The Latin American Market for Sporting and Athletic Goods. Besides these, there were ready for publication at the end of the fiscal year bulletins on the markets for athletic goods in the Far East and in Africa and the Near East, for furniture in Europe and in Latin America, and on the German toy industry.

On the basis of reports from the field, 53 special circulars were prepared and distributed to the various trades and 414 articles were prepared for Commerce Reports. About 250 special reports were distributed to trade associations and individual firms on request. More than 300 reports were furnished to trade journals and the press, and about 4,000 articles resulted. More than 1,100 trade opportunities were received in the division, and 1,012 of these were published.

In the issue of Commerce Reports for November 12, 1923, there appeared the first of the monthly surveys of specialty exports. Exports for each of the four quarters of the year are given in the first issues in May, August, November, and February. Articles of a special nature were contributed during the year to various trade journals. The specialties division had charge of compiling and preparing the material for the booklet entitled "Helping the Exporter," illustrating the services of the bureau.

The survey of foreign advertising mediums and methods, made by means of a detailed questionnaire sent to all American counsels throughout the world, is nearing completion, and the new service will soon be made available through the bureau's district offices.

The division has maintained close cooperation with trade associations. As chairman of the bureau's committee on exhibits, Mr. Morse devoted much time to the proper preparation of exhibits for important trade-organization meetings.

In connection with the domestic-commerce surveys being conducted by the bureau, the specialties division is making a survey of the sanitary-ware situation in the United States.

During the fiscal year 1924, 5,310 inquiries were answered by letter and 817 memoranda were prepared. Trade journals reviewed and indexed numbered 1,589.

TEXTILE DIVISION

The textile division is constantly called upon by various other branches of the Government for advice and direction in the matter of obtaining their textile supplies or in the disposition of surplus war materials; relations with the War and Navy Departments, the Public Health Service, and the Marine Corps have been especially close. The division has also held numerous conferences with a view to marketing prison-made goods in a manner less detrimental to the legitimate manufacturer. After the Japanese earthquake the division assisted the Red Cross in acquiring approximately $3,000,000 worth of clothing for relief work, and it is conservatively estimated that at least $300,000 was saved to the Red Cross through the services of the division and its contacts in the textile industry. Reliable estimates of the destruction of raw-silk stocks and of cotton-mill machinery in Japan were obtained and supplied to interested persons in this country.

Difficulties experienced by cordage manufacturers in securing supplies of sisal from Yucatan led to the inauguration of a monthly cable service beginning April 1, 1924, whereby the American consul in Progreso reports to the textile division the stocks of sisal on hand, shipments, export taxes, crop conditions, and other developments. The opinions of the fur trade as to the Government's methods of disposing of Alaska fur-seal skins were ascertained through personal interviews by the bureau's branch offices, and a complete tabulation of these reports was made. Executives of the Boy Scouts were advised as to clothing specifications and methods of placing their business for uniforms.

A large cotton export firm asked the bureau's assistance in the protection of 25,000 bales of cotton, worth about $2,500,000, in or on the way to the disturbed area in Mexico last December. The textile division intervened through the State Department in behalf of this firm, and arrangements were made for safe storage in warehouses. As a result of representations made by the division, through the State Department, the Bulgarian courts permitted an important cotton-goods house in New York to register its trade-mark, a previous application having been rejected. The division maintains close contact with nearly 50 organizations or committees representing various textile industries. Numerous conferences were held with their membership. In some cases displays and specially written articles were furnished for association meetings.

In May, 1924, the chief of the division sailed to Europe to investigate textile conditions and markets; his itinerary includes such important centers as Manchester, Bradford, Dundee, Belfast, Liverpool, Copenhagen, Havre, Paris, Lille, Roubaix, Tourcoing, Milan, Vienna, Prague, Hamburg, Berlin, Bremen, etc.

Through the bureau's representative in India, the textile division has helped a New York firm to sell hundreds of thousands of dollars' worth of cotton-goods remnants. An American line of

athletic underwear, etc., has become established in some of the Latin American countries through the assistance of the textile division and field officers of the bureau. These are only two out of the many concrete results attained by American manufacturers through the specific services of the division.

The special statistical services of the division include: A world survey of the cotton situation every four months, showing production, consumption, and stocks; a world survey of wool production; Bradford wool top prices, received by cable each week, together with opening and closing prices of the London wool auctions; weekly statistics of imports of raw wool at New York, Boston, and Philadelphia; weekly average prices of cotton gray cloth for such important piece-goods markets as Osaka, Manchester, New York, Calcutta, Madras, and Bombay (released semimonthly).

The textile division tabulated, as soon as available, the year's figures of the United States imports of cotton piece goods, not only by countries of origin but by classes, weaves, and yarn numbers, and mailed these statistics to interested manufacturers, importers, and exporters. In cooperation with the statistical division, arrangements were made to tabulate the imports of cotton cloth at New York, Boston, Philadelphia, and Chicago, showing commercial names; at present these figures are released soon after the close of each month. A number of articles analyzing the foreign-trade figures of the United States were published in Commerce Reports during the year. Regular bulletins dealing with special sections of the industry include: "The cotton service bulletin," weekly: "What the world's cotton-goods markets are doing," weekly; "Foreign-trade notes on yarn and knit goods," about once a month; "World's wool digest," weekly; "Comparison of international cotton gray cloth prices," semimonthly; "Dry-goods merchants' world news letter," fortnightly, designed for the domestic trade. The number of copies of these regular bulletins mailed out during the fiscal year 1924 totaled 260,000 (against 69,000 in the preceding year), in addition to 150,000 copies of special bulletins (as compared with 48,000 in 1923), covering 156 different subjects, such as "Review of the British wool industry," "Kapok production and marketing in Japan," "Notes of interest to the carpet and rug trade," "Argentine market for American textiles," and "Australian hosiery market." Trade information bulletins issued by the division included The London Market for American Textiles, Cotton Goods in Survey, Selling American Hosiery Abroad, and The Belgian Wool Industry. The division prepared 770 articles for Commerce Reports.

The textile division received 37,000 pieces of incoming mail during the year, and outgoing letters totaled 11,500, of which 5,500 were answers to definite requests from the trade; of these latter about 3,000 required special research. Members of the division discussed textile questions with 550 visitors to the Washington office.

TRANSPORTATION DIVISION

Much time was devoted by the transportation division to the preparation and publication of special reports, of which the most important was Packing for Foreign Markets, containing about 275 pages of text and 245 illustrations. The more general parts of this

book were condensed and published as a trade information bulletin, which was distributed to 20,000 shippers and shipping companies. The American Railway Association reprinted excerpts which it sent to 400,000 individuals and companies in the United States and Canada. A handbook on Railways of Central America and the West Indies, the first of a series on Latin American railways, was completed and sent to the printer, while the work on Mexican Railways is well along toward completion. A report on Highways in Latin America was undertaken, and preliminary reports on all countries were completed in time for the meeting of the Pan American Highway Conference in June. Trade information bulletins other than the one already mentioned included Transportation in Relation to the Export Trade in Agricultural Products, Rate Procedure of Steamship Conferences, and The Geneva Conference and Ocean Shipping.

The chief of the division served on a number of special committees, including the President's Committee on Shipping. The transportation division represented the Department of Commerce in the negotiations leading to the Pan American Highway Conference mentioned above. In cooperation with the domestic commerce division, the transportation division has undertaken a program of activity in connection with domestic packing, which is expected to develop important improvements through reductions in damage and pilferage and in initial container costs.

The chief sailed for Europe June 14 to make an extended study of foreign steamship rates and conferences, free ports, and the principal locomotive and car-building industries.

The division aided the freight-claim-prevention work of the American Railway Association with the object (attained in part) of reducing the waste due to loss and damage. Numerous packing surveys were made for leading exporters, and packing specifications and instructions were furnished which resulted in better and more economical shipping containers.

The increase in the work of the division is indicated by the fact that the inquiries answered during 1924 numbered 20,940, as compared with 15,193 in 1923.

In the fall of 1923 an investigation was begun of the transportation of perishable fruits and vegetables, more especially Pacific coast commodities.

A publication is now being completed which will include all essential information concerning shipments by mail to foreign countries. Miscellaneous Series No. 121, International Communications, was prepared by the chief of the communications section of the division, who left May 15 for Mexico City as secretary to the American delegation to the Pan American Electrical Communications Conference which opened May 27. The communications section handles inquiries covering traffic, rates, schedules, and legislation in regard to commercial aviation abroad. A map showing the important aviation routes in western Europe was prepared. The section gathered statistics showing the financial standing, equipment, services, and concessions of many of the telephone systems throughout the world, especially in China. Reports of telegraph, cable, and radio services, regulations, equipment, and proposed extensions have been acquired and used as reference material to aid in answering inquiries.

INVESTIGATIONS OF RAW MATERIALS AND AGRICULTURAL PRODUCTS

The raw-material surveys begun during the preceding fiscal year were continued and brought toward completion in 1923–24.

The primary purpose of the crude-rubber survey has been to study areas capable of producing rubber in competition with the plantations of the Far East, where the exportation of rubber is under monopoly control. Of the four parties sent out the so-called "Middle East" party left for India, Ceylon, British Malaya, and the Dutch East Indies in May, 1923, and returned in March, 1924. Its report was finished the 1st of May and was sent to the Printing Office May 18, the first proof being received June 25. The Caribbean party left in July, 1923, and, after covering the Central American States, Panama, the Atrato region of Colombia, and certain parts of the coastal region of Ecuador, returned early in April, 1924, and is now getting its report in shape for publication. The Amazon party left in July, 1923, and in cooperation with the Brazilian Government, which furnished a river steamer, explored all the political units of the Amazon Basin except Colombia and Ecuador. The members of this party returned in June, 1924, and are preparing their report. Those in the Philippine party left in September, 1923; they covered the southern Philippines and British North Borneo and obtained information concerning Sarawak. They returned the latter part of May, 1924, and their report is nearly ready for publication. The office force at Washington has collected information concerning all the countries not covered by the field parties, especially Africa. It has also been working on statistics with regard to the production of crude rubber, from all political units where it grows, from 1900 to the present. Publications covering these studies are being prepared. Statistics concerning the production and sources of gutta-percha, balata, and chicle have also been compiled. It is planned to send an investigating party to southern Mexico and also to Haiti, and perhaps another party to Liberia.

The nitrogen survey was continued. A field investigation into the factors controlling the costs of Chilean nitrate was undertaken; the results of this were incorporated in Trade Information Bulletin No. 170, The Cost of Chilean Nitrate, issued in January, 1924. A comprehensive study was made of the nitrogen situation in the United States, the results being embodied in Trade Information Bulletin No. 226, issued in May, 1924. A survey was made of the technical development and economic aspects of the air-nitrogen industry of the world, the results being published in June, 1924, in Trade Information Bulletin No. 240. Two additional reports are now being assembled, namely, Part VI, dealing with the nitrogen situation in various countries of Europe, and Part V, which is a bibliography and guide to technical and economic literature with particular reference to the air-nitrogen processes.

The results of the sisal investigation carried out in Yucatan were embodied in Trade Information Bulletin No. 200, entitled "Sisal: Production, Prices, and Marketing."

The study of the domestic resources of vegetable-tanning materials of the United States, coupled with an analysis of our growing dependence on foreign sources and of the production and consumption

of such materials, was crystallized in Trade Information Bulletin No. 167, The Problem of Our Commercial Independence in Tanning Materials. In consequence of the suggestions in this report, Congress made an appropriation for a survey of the stands of chestnut timber and a study of the spread of the blight and the best methods of resisting it. Trade Information Bulletin No. 211, Wattle Culture, has aroused much interest in the possibility of the cultivation of this valuable tanning material in the United States and in Central and South America. A trade information bulletin dealing with chrome ore and chrome salts is about to go to press. Other trade information bulletins, including a survey of the quebracho industry and one giving an analysis of the production of tanning extracts and the consumption of foreign and domestic tanning materials and extracts, are in preparation. Samples of several new tanning materials have been received from Mexico and Central America and submitted for analysis. It is intended to broaden and intensify this service during the coming year, so that American tanners may be kept fully advised as to the possible development and use of new vegetable-tanning materials throughout the world.

The first phase of the bureau's survey of world trade in agricultural products is a statistical study designed to give a background of fact not only with regard to American trade in the most important agricultural products but also the details of the trade of our principal competitors and our most important customers. Under this heading eight comprehensive pieces of work have been completed and will appear in published form during the coming year. They will cover the period from 1909 to the latest figures available. The products covered by these bulletins are wheat, wheat flour, and rye; corn, oats, and barley; tobacco; sugar; meats; cotton; wool; and silk and other fibers.

A careful study has been made of the distribution of the total trade of the United States in all agricultural products. Trade Information Bulletin No. 177, The Distribution of Agricultural Exports from the United States, has already been published. A second bulletin, dealing with a comparison of the export value and the physical volume of our export trade in agricultural products, has been completed and is ready for printing. A third bulletin in this series will deal with other aspects of our export trade and also with our import trade in agricultural products.

A second phase of this work is concerned with the methods employed by exporters in buying, handling, and selling agricultural products. Questions of how exporters finance their operations, questions of transportation, storage, warehousing, ocean freights, insurance, packing, distribution in foreign countries, etc., have been studied and the results in part have been published. Trade information bulletins dealing with this phase of the work have been: No. 183, Buying Wheat for Europe; No. 185, Selling American Wheat Abroad; No. 216, Transportation in Relation to the Export Trade in Agricultural Products; No. 241, Financing Agricultural Exports from the United States. Another bulletin dealing with methods of marketing Canadian wheat is now at the Printing Office. The manuscript has been completed on a number of other studies of this character. Forthcoming bulletins will deal with methods of marketing export cotton, meats, tobacco, vegetable oils, etc.

The third phase of this work deals with European economic conditions and foreign methods and practices that affect the market for American agricultural products. Two bulletins have so far been published dealing with this part of the work—No. 235, European Economic Conditions Which Affect the Market for Agricultural Products; No. 233, Foreign Import Duties on Wheat, Wheat Flour, Meats, and Meat Products. A number of related studies either have been completed or will be finished in the near future. Among these are studies of the methods employed by European importers in handling agricultural products—methods of financing imported farm products, cooperative marketing in relation to the distribution trade methods of financing agricultural production and marketing abroad, etc.

The total results of the work in world trade in agricultural products will be published in about 30 bulletins, of which 8 have appeared up to the end of the fiscal year. This work was done very largely by the regular staff of the bureau, though it was necessary to employ a few additional temporary clerks and two or three marketing experts. Excellent cooperation has been received from the trade.

TECHNICAL DIVISIONS

DIVISION OF FOREIGN TARIFFS

The division of foreign tariffs gives advice on the conditions governing the shipment of goods from one country to another, especially duties, documents, consular and customs procedure and requirements, and all related regulations, restrictions, and charges. It supplies information concerning internal charges or regulations in foreign countries affecting imported goods, such as sales or luxury taxes, consumption or excise duties, and quality standards officially established. The division keeps informed as to the licenses and fees to which commercial travelers are subject abroad and the customs treatment of their selling samples in each country. It advises with regard to the shipment of advertising matter and samples abroad. It furnishes data as to the export duties, restrictions, and regulations of foreign countries. The division studies the economic conditions and commercial policies of important foreign countries and gives close attention to commercial treaties, reciprocal agreements, and preferential arrangements.

The number of letters written by the division during the fiscal year 1924 was 6,523, a great proportion of these necessitating research and most of them being acompanied by specially prepared statements and memoranda. In addition, there were more than 1,200 visitors to the division in Washington during the year, as well as more than 1,300 telephone calls.

The division published regularly in Commerce Reports all changes in foreign tariffs, customs and consular regulations, and internal taxes that are of interest to American exporters.

In order to obtain a better understanding of the drift of European tariff legislation and commercial policy, the chief of the division made a first-hand study of the situation in the principal coun-

tries of western and central Europe. As one of the results of this trip a trade-information bulletin was issued on European Tariff Policies Since the War.

Two pamphlets, entitled "Shipment of Samples and Advertising Matter to Europe" and "Shipment of Samples and Advertising Matter to the British Empire," were issued, outlining in detail the customs regulations, duties, and other factors that should be taken into account in this connection.

Before the patent and trade-mark section of the bureau was transferred from this division to the division of commercial laws two pamphlets on Trade-Mark Protection in Europe and Trade-Mark Protection in Latin America were issued.

The consular regulations of Canada and the Latin American countries, covering the documentary requirements, consular fees, packing and marking requirements, etc., imposed upon shipments going to countries of Latin America and the West Indies, have been compiled and issued in mimeographed form for each country concerned.

In accordance with a new system introduced advance copies of items prepared for publication in the tariff and trade regulations section of Commerce Reports are sent to the district offices in those areas where there are industries interested in the information, enabling the branch offices to distribute the data from three days to a week in advance of its appearance in the weekly.

Another additional service recently instituted is that of following up requests (already answered) with further correspondence when additional information is received; as for instance, when a change in the situation occurs.

The increase in the staff of the division that has taken place in the last few years necessitated a reorganization, with regional sections. This change is expected to result in a more rapid handling of the regularly recurring work of the division.

DIVISION OF COMMERCIAL LAWS

During the past year the division of commercial laws has rendered services which, directly and indirectly, have resulted in economies to American foreign trade that may be calculated in terms of many hundreds of thousands of dollars. The division's aims are to supply and compile information covering all legal phases of trading abroad and to assist American firms and their counsel in the solution of their foreign legal troubles.

Among the notable achievements of the division the following may be cited: A list of 8,000 investigated attorneys in foreign countries has been compiled and is at the service of American manufacturers and their legal advisers. A study has been made of cases of contract repudiation and breach, and many cases of fraud and bad faith have been investigated and dealt with, remedies having also been suggested, through the proper wording of contract clauses and through the inclusion of provisions for proper inspection of shipments. Special attention has been paid to the movement for commercial arbitration, and the work of the division has contributed in no small degree toward making this a practical and effi-

cient remedy accessible to business men. The division has studied carefully (and given assistance regarding) the standardization of rules governing the liability of cargo carriers in ocean traffic. The important question of the advisability of protesting unpaid drafts, and the formalities connected therewith, has been covered by a thorough investigation, the results of which have been embodied in a series of trade information bulletins.

An exhaustive study of the taxation systems in foreign countries has been made, especially throwing light upon the liability of American principals to taxation where foreign business is conducted through agents. The patent and trade-mark section has contributed to the greater safety of American interests in foreign countries by installing a world-wide system of reporting upon cases of trade-mark piracy and patent infringement. The division has now a complete topical file of information on bankruptcies, bills of exchange, conditional sales, powers of attorney, incorporation, and taxation of all commercial countries. The question of agency arrangements has been made the subject of a thorough study, the principal pitfalls of the problem have been carefully illuminated, and effective remedies have been suggested. The division has completed arrangements with competent legal advisers in the capital of every State in the Union for current reporting upon legislative changes affecting commerce. A directory of legal activities of all United States Government departments and commissions has been initiated and is now in course of preparation.

The division has enabled a number of American law firms to equip themselves for dealing with the legal problems of their American clients in export and import transactions. The division has brought about a careful scrutiny, on the part of publishers of export periodicals, of every advertisement that is accepted for insertion therein.

Trade information bulletins issued by the division have included Agency Agreements in Foreign Trade, Protesting Drafts, Construction Enterprises and Contractors' Requirements (in various foreign countries), Legal Aspects of Trade in Portugal, Trading Under the Laws of the Union of South Africa, Trading Under the Laws of Argentina, Bankruptcy and Insolvency Laws of Argentina, and Consignment Laws of Chile and Bolivia. Bulletins prepared but not yet published deal with taxation in Belgium, Italy, and Great Britain.

Nineteen special circulars have been prepared by the division, including such topics as "Cuban decision on protest of drafts," "Taxation of income in British India," "Leasing of State lands in Cuba," "Dutch law on agency and agency contracts," and "Rights of foreigners under Soviet laws in Russia."

Two hundred and six articles on topics of foreign laws have been prepared for publication in Commerce Reports during the year, covering 47 countries. The articles discuss, among others, the following leading topics: Agency laws, taxation laws, bankruptcy laws, consignment and conditional-sale laws, company laws, pension laws, powers of attorney, and general trading laws.

In the fiscal year 1924 the division's outgoing letters totaled 14,724 (including only correspondence received by the division direct),

against 10,376 in 1923 (including also letters received by the bureau's district offices for attention of the division of commercial laws).

The adjustment section has helped American importers in a number of cases where defective products (oil, nuts, seeds, etc.) were shipped by foreign exporters after collecting on letters of credit against shipping documents. The division has also investigated a number of trade complaints originating abroad and has succeeded in straightening out many of them. During the fiscal year 1924 the division has handled 173 complaints of American concerns against foreign firms, involving about $350,000. During the same time 185 complaints of foreign concerns against domestic firms have been handled. More than 1,000 American claims against foreign concerns have been passed on by means of interviews or personal advice.

The section of legal information is in touch with a leading law firm in each State in the United States and with legal advisory committees in New York and in Philadelphia. The division organized a voluntary law-school advisory committee, chosen from the deans and professors of the foremost law schools in the country. Through this committee the division is fostering the introduction into the curricula of courses designed to acquaint students with international commercial law.

The bureau's patent and trade-mark section was transferred to the division of commercial laws on March 1, 1924. Notification of any apparent attempt to "pirate" an American trade-mark is promptly transmitted to the concern interested, so that it may oppose the registration of the trade-mark or apply for its cancellation. Advice is continually being given on specific problems. A complete and up-to-date file of foreign legislation is maintained. An advisory committee has been chosen to enable this section to give proper advice under difficult circumstances. An important part was taken in the discussions for the revision of the trade-mark agreement of 1910 at the Santiago trade-mark convention of 1923. At the request of the International Chamber of Commerce and of the State Department suggestions were made for revising certain international conventions for the protection of industrial property and the registration of trade-marks. At the request of the Cuban Secretary of Agriculture suggestions were made and a draft of a proposed law suitable to the needs of Cuba's expanding commerce was prepared. Besides the trade information bulletins mentioned elsewhere, various special circulars were issued by this section, including one on the conditions for restoring applications for patents and trade-marks and reviving registrations that had been destroyed in the Japanese earthquake. There has been a development of valuable cooperation between this section and trade associations.

The service of the insurance section has two purposes. One is to aid American firms in problems relating to marine insurance, cargo carriers' liability, terms of policies; fire insurance in foreign countries where American firms maintain branches, warehouses, and offices; pension laws of countries where Americans have employees; bonding and suretyships in foreign trade. In the second instance the section aims to serve American insurance companies operating abroad. An insurance advisory committee has assisted this section. Numerous applications for the agencies of American insurance companies have been passed on as trade opportunities. An insurance

questionnaire covering every phase of the insurance business was prepared during the year and sent to the bureau's field officers and to consular officers of the Department of State. The replies to this are now coming in and will form the basis of a series of trade information bulletins.

FINANCE AND INVESTMENT DIVISION

The chief of the finance and investment division has devoted a large part of his time to keeping the division in close touch with the financial houses interested in foreign trade. He has made many speeches before conventions of bankers and exporters. Since April 8, 1924, he has been in Europe investigating the organization of investment trusts and bondholders' protective associations.

During the year the division took up the task of analyzing and publishing the budgets of Latin-American and Far Eastern nations and important municipalities, with special reference to their bearing on the advisability of American investments. A large part of its work has consisted of research in connection with requests from banks and others for information regarding public debts, foreign and internal loans, currency, exchange, etc., of foreign countries. Many of these requests have involved extensive compilations and analyses.

Trade information bulletins issued by the division during the year have included British Banking, Changes in the Monetary Use of Silver Since 1914; Balance of International Payments of the United States in 1922; Principal Features of Chilean Public Finance; The Bolivian Public Debt; The Bolivian Fiscal System; British Financial Conditions in 1923; Currency, Exchange, and Banking in Bolivia; and The Balance of International Payments of the United States in 1923.

The division has compiled all available statistics of American investments abroad and of foreign investments in the United States and keeps a list of the current offerings of foreign securities in this country. During the year there has been completed a revision of the handbook, Investments in Latin America and the British West Indies, which is now being prepared for publication. The division receives from abroad many reports on specific opportunities for investment of American capital. These are critically examined, and when they seem promising they are forwarded to those bankers and engineering concerns that are known to be interested.

From among the 44 special circulars issued by the division during the year the following titles may be mentioned as representative: "Ecuadorean exchange situation"; "Progress of bank liquidation in Cuba"; "The new German currency"; "Operations of French investment companies"; "Proposed international bank in Sofia"; "The public debt of Argentina"; "The Netherlands: Basic elements in florin exchange"; "Austrian banks as a field for American investments"; "Recent Italian legislation affecting foreign investments"; "Great Britain and the gold standard."

During the last few months investigations have been carried on in Europe by special representatives of the division with reference to banking in Scandinavia, emigrants' remittances, and methods em-

ployed in Europe to finance the importation of agricultural commodities.

The inquiries answered by the division in the fiscal year 1924 totaled 4,582, as compared with 3,717 in 1923.

DIVISION OF RESEARCH

The division of research has continued its work of (1) preparation of copy for major statistical publications, (2) information service to correspondents, and (3) services of a varied expert and technical character to other divisions of the bureau. The most important new work of the division was the assembling and coordinating of the Commerce Yearbook, together with the entire preparation of a large part of it. The initial issue of this publication has elicited the most favorable comment. The 1922 issue of the Statistical Abstract of the United States was shortened by the omission of obsolete and too detailed material, and for the 1923 issue there was undertaken a thorough revision designed to make the Abstract a more comprehensive and better balanced handbook of economic and social statistics. The foreign-country sections of the Survey of Current Business continue to be compiled in this division. Data for the United States section of the Statesman's Yearbook was prepared, and the League of Nations was regularly supplied with United States data for its Monthly Bulletin.

Semiannual reviews of the trade of the United States with the world have been prepared and published as trade information bulletins. The series of studies of principal tanning materials begun in 1922–23 in conjunction with the hide and leather division was continued; investigations covering divi-divi, sumac, and chromite and an expansion of the wattle and quebracho studies of the previous year have been completed. A number of similar reports have been prepared in conjunction with other divisions, the outstanding ones being surveys of the camphor and the chicle and chewing-gum industries.

The division continued its direction of the graphical and drafting work of the bureau. The drafting staff has been increased somewhat, and there was a marked expansion in the volume of work, about 1,000 charts, maps, etc., of varying sizes having been prepared during 1923–24.

The division aids other divisions of the bureau and other Government offices by translating from foreign languages and explaining and assisting in the use of foreign statistical sources.

The direct service of the division to correspondents falls under two heads—(1) furnishing data on the foreign trade of other countries, and (2) general economic and statistical inquiries not of a strictly commodity, regional, or technical character. For the most part these required a considerable amount of research and tabulation.

DIVISION OF STATISTICS

The statistical division prepares statements of imports, exports, vessels entered and cleared, and other statistics of the trade of the United States with foreign countries and noncontiguous territories

for publication in the Monthly Summary and the annual report on Foreign Commerce and Navigation, issues regulations and instructions regarding the statistical reports, prepares the classifications of imports and exports for the guidance of collectors of customs, and handles the correspondence and inquiries relating to United States foreign-trade statistics. The published statements are compiled from monthly and quarterly reports prepared by the section of customs statistics at New York from import entries and export declarations forwarded from the various customhouses.

The mimeographed statement of exports of food products released to the press in advance of the Monthly Summary has been subdivided into three separate statements, covering (1) meats and fats, (2) canned and dried foods, and (3) grains and preparations. New advance statements of imports of cotton, wool, silk, artificial silk, jute, sisal, and other fibers have been issued since February of this year. Beginning with January, 1924, a statement showing quantities of about 100 principal imported commodities remaining in bonded warehouses has been published in part 2 of the Monthly Summary. A new edition of Trade of the United States with the World is in course of preparation, showing the imports from and exports to the different foreign countries by articles during the calendar years 1921 and 1922.

About 225 special monthly mimeographed statements of imports and exports are distributed to more than 17,000 addresses, giving complete details by countries for the articles covered. The inquiries answered by the division of statistics increased from 9,677 in the fiscal year 1923 to 11,130 in 1924, of which 5,228 were letters and the remainder personal and telephone inquiries.

The division furnishes reports to the Tariff Commission, Census Bureau, Federal Reserve Board, Geological Survey, Bureau of Agricultural Economics, Federal Trade Commission, and other Government departments.

In addition to the weekly reports of exports of grains and flour begun in 1923, weekly reports of imports of wheat from Canada through principal northern border ports have been compiled since January 1, 1924, showing separately wheat entered for consumption, duty paid, and entered free of duty into bonded mills for grinding into flour for export. These reports are released to the press and distributed in mimeographed form to interested parties on Tuesday of each week. Weekly reports of imports of raw wool at Boston, New York, and Philadelphia have been issued since April, 1924, showing the kinds of wool by grade, condition, country of origin, and country of shipment.

At the request of the National Cotton Manufacturers Association, special monthly reports have been issued since February 15, 1924, showing the kinds of cotton cloths imported at 5 principal ports, according to 18 separate trade designations. Steps are under way for issuing in the near future, at the request of the woolen-goods industry, special reports of imports of wool cloths and dress goods by trade designations.

Under regulations issued on November 2, 1923, by the Postmaster General at the request of the Secretary of Commerce, business firms mailing abroad packages of merchandise valued at $25 and over are required to fill out a postal export declaration giving description,

quantities, and values of the goods shipped. The declarations are forwarded by the postmasters to the section of customs statistics at New York and since January, 1924, have been included in the regular statistical reports of exports published in the Monthly Summary. During the six months ended June 30 parcel-post exports valued at nearly $11,000,000 have been reported, dry goods and clothing accounting for nearly one-fourth of the total.

The first report giving statistics of exports by States of origin has been completed, covering exports during the quarter ended March 31, 1924. The principal features of the new report, giving the principal articles exported from 25 leading States, were pointed out in articles released to principal newspapers and trade journals. The preparation of these reports has proved to be a much greater task for the section of customs statistics at New York than had been anticipated, and additional personnel and mechanical tabulating equipment are needed.

COMMERCIAL INTELLIGENCE DIVISION

The main functions of the commercial intelligence division are: To compile and publish lists of foreign importers and dealers in all commodities throughout the world; to maintain a file, in card-index form, of detailed information relative to sales facilities and business organization of individual foreign business concerns, from this file to make to American firms reports as requested, including all credit sources available to enable the American firm to rate the foreign buyer as a credit risk, and to be prepared to obtain reports of this character on any foreign firm wherever located if the information is not on file; to assist American business houses in the selection of foreign agents; to record and make available to American banks interested in foreign-exchange transactions information concerning foreign business concerns that fail, become bankrupt, go into liquidation, etc.

During the fiscal year 1924 the new trade lists (and revisions of old ones) made available to American business men numbered 844. There are now available lists of importers and dealers in nearly 100 foreign countries and territories, so listed that the commodities handled are indicated. Approximately 200 commodities are treated. About 360,000 names are now on file, from which trade lists are compiled. During the year 28,451 requests were received for detailed reports on individual foreign firms.

The nature of the work in this division is such that the correspondence handled must necessarily be extensive, and form letters are impracticable. More than 12,000 letters were sent out during the year, an increase of 300 per cent over the preceding year.

DOMESTIC COMMERCE DIVISION

The domestic commerce division was organized July 1, 1923. Its functions are, first, to coordinate and direct the activities of the commodity divisions in connection with domestic-commerce studies relating to particular commodities, and, second, to conduct research on such general problems as cancellations, plant location, warehous-

ing as a factor in distribution. Surveys of district marketing areas in the United States constitute an important phase of the work.

Thus far most of the work of the division has been done in response to direct requests for assistance from manufacturers and distributors. In addition to this, several conferences of representatives of retailers', wholesalers', and manufacturers' associations in various lines have been held. At these meetings functions were defined or problems worked out. In various industries committees have been appointed to work with the division. These committees cover such organizations as the National Association of Retail Grocers, National Association of Retail Clothiers, National Wholesale Drygoods Association, National Boot & Shoe Manufacturers' Association, and others, 29 in all.

In cooperation with the domestic commerce division, commodity divisions have made or are now making studies on the marketing of electrical household appliances, paints and varnishes, and sanitary ware and also on packing problems. A study on the marketing of machine tools and a study of sales contracts will be undertaken shortly. The domestic commerce division is making a study of plant location, a study of sales territories, of warehousing, and three distinct studies in the retail field, besides a careful study of the cancellation problem.

The division is developing its regional studies by sending a market analyst into a region to report on the industry, commerce, and retail business of that section, much as he would report on a foreign country.

The various trades have shown much interest in the work of this division, which will be able to render valuable service to the business world when its existence and potential worth become impressed upon the public.

ADMINISTRATIVE DIVISIONS

EDITORIAL DIVISION

Commerce Reports, the weekly magazine issued by the bureau, has continued along much the same lines as during the preceding year. At the beginning of each issue there has been introduced a new department, called " Commerce news in brief," containing concise summaries of the principal articles. Because of increased cost of printing, the subscription price of Commerce Reports is to be increased from $3 to $4 per year, effective July 15.

The number of reports received from the Consular Service of the Department of State increased from 37,058 in the fiscal year 1923 to 39,402 in 1924. There has also been a steady increase in the number and quality of reports from the foreign representatives of the Department of Commerce. The number of Foreign Trade Opportunities published in Commerce Reports in the fiscal year 1924 was 3,846, as compared with 4,290 in 1923 and 2,960 in 1922.

The most important single publication issued by the bureau during the fiscal year was the Commerce Yearbook for 1922 (including the early part of 1923). This contains 700 pages, is illustrated with many charts and maps, and forms an authoritative review of the economic year throughout the world, for the point of view of Ameri-

can industry and commerce. In this book the outstanding facts of trade, production, price changes, and market conditions are tabulated and analyzed. Summaries are included of the principal manufacturing, mining, and forestry industries, of agriculture, construction, transportation, communication, finance, prices, and domestic and foreign trade of the United States, with reviews of the commercial and industrial developments in the principal foreign countries. This first yearbook has been widely used and warmly praised by the business men of the nation. Work on the second Commerce Yearbook, covering 1923, has been pushed forward vigorously during the first six months of 1924, and it will soon come from the press.

Another very important monograph is Packing for Foreign Markets. There is also an elaborate survey of Railways of Central America and the West Indies, which will make a book of about 450 pages, amply illustrated with maps, diagrams, and halftones. A significant series of studies of the public finance of Latin American countries was begun with the publication of Chilean Public Finance and the sending to the printer of Bolivian Public Finance.

The three different series in which the bureau's larger monographs had formerly been issued—the special agents series, the special consular reports, and the miscellaneous series—were combined under the new title "trade promotion series."

During the year there has been a great increase in the number and importance of the special supplements to Commerce Reports which are called trade information bulletins. These have possessed an exceptional quality of timeliness. Their general character is indicated by the following typical titles, out of the 122 bulletins issued: Methods of Handling Lumber Imports in Australia, New Zealand, and Pacific Islands; Bankruptcy and Insolvency Laws of Argentina; The Brazilian Market for Paper and Paper Products; Italian Government Finances; Austrian Trade in Rubber Products; The British Steel Industry; Changes in the Monetary Use of Silver Since 1914; Japan After the Earthquake; American Trade with Germany, 1914, 1921, and 1922; The Belgian Congo; Survey of World Trade in Agricultural Products.

DIVISION OF CORRESPONDENCE AND DISTRIBUTION

This division comprises two distinct sections—correspondence and distribution.

Besides the actual routing of incoming correspondence and the examination of outgoing letters, the correspondence section offers suggestions and advice to the various divisions with a view to insuring that the correspondence shall reflect the existing policy of the bureau and the department. It also carries on a large correspondence of its own in relation to a variety of subjects, answering about 24,000 inquiries by mail during the fiscal year. Almost 300,000 letters were handled by the division during the fiscal year 1924, as compared with 332,131 in 1923 and 127,385 in 1922.

Records kept by this division show the number of commercial inquiries answered by the bureau and its district and cooperative offices, these totaling 1,236,326 in the fiscal year 1924, as compared with 972,702 in 1923 and 589,533 in 1922. There has thus been an increase of 131 per cent in two years.

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

The records show an extraordinary increase in the number of trade lists asked for by American business men in the fiscal year—417,195 in 1924, against 181,049 in 1923 and 71,900 in 1922. The total number of trade lists distributed in 1924 was about 1,000,000, representing 1,318 separate lists.

The number of copies of confidential and special circulars sent out during the year totaled 3,101,118, comprising 2,227 separate statements, as compared with about 1,000,000, involving 1,100 separate statements, for the preceding year, and 350,000, covering 744 statements, in 1922. Thus the number increased nearly tenfold in two years.

Further experience with the plan of maintaining in the correspondence division a group of reserve stenographers and typists who are available, upon request, for work in other units of the bureau has emphasized the wisdom of this service.

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

On May 15, 1924, the bureau took over the control of the mimeograph work which had previously been carried on under the supervision of the division of publications of the department, and at the same time there was transferred from the distribution section of this bureau to the duplicating section the assembling, the placing of material in envelopes, the sealing and mailing, which operations had theretofore formed a part of the duties of the distributing section. This change has resulted in various economies. A special committee appointed toward the close of the fiscal year is giving attention to the matter of revising the various mailing lists of the bureau, the idea being to consolidate these various records into one list, which will probably be an extension of the Exporters' Index.

The revision of the Exporters' Index started during the previous fiscal year has progressed rapidly and is now practically completed. This involves a complete change in the mechanical operation of the Index as well as an entire revision of the commodity classifications used in this record.

FOREIGN SERVICE DIVISION

The direct administration of the bureau's foreign service centers in the foreign service division. Through it pass all communications, either postal or telegraphic, going to and from the field. The arranging of steamship reservations, the acknowledging and routing of all incoming mail and the proper forwarding of all telegraphic communications, the preparation of the budget of the foreign offices, and administrative decisions with respect to personnel are matters coming within the scope of the division's activities.

A total of 5,754 cablegrams were transmitted between the field and the bureau during the fiscal year 1924, as compared with 4,200 for the year previous and 3,127 for 1922. During the past year 29,920 other communications were received from the field. Of these 6,655 were

special reports, economic and trade notes, or trade opportunities, while 9,363 were letters addressed by the field staff directly to American business firms in reply to specific inquiries.

By means of the "liaison file" that the division maintains a copy of every report received from the field is immediately made available to every other department of the Government. During the past year 3,470 reports were actually furnished to other departments.

The system of reporting by the foreign staff has been reorganized. Through the organization of the "questionnaire committee" requests for information on the market possibilities of any commodity are sent simultaneously to the whole field. During the year there were sent out 114 such questionnaires, in the case of 92 of which the Consular Service of the Department of State participated in the reporting. For the coming year each foreign office of the bureau will have a prearranged schedule to follow, providing for regular cabled and mail reports on every fundamental industry and commodity concerned in the foreign trade of this country.

This division arranged itineraries to the principal cities of the country for foreign representatives on their return to the United States. Through personal conferences and addresses such representatives have achieved important results.

Since July 1, 1923, three new foreign offices have been established by the bureau, eight major investigations have been started, and numerous minor investigations have been initiated and brought to a conclusion. These are described in other sections of this report.

Two new commercial attachés, 14 trade commissioners, 10 assistant trade commissioners, and 9 American clerks have been appointed during the year. Resignations have included 1 commercial attaché, 4 trade commissioners, 4 assistant trade commissioners, and 4 American clerks.

DIVISION OF DISTRICT OFFICES

The fiscal year began with 9 district and 24 cooperative offices of the bureau. During the year new cooperative offices were established at Birmingham, Ala.; Muncie, Ind.; Providence, R. I.; Springfield, Mass.; Toledo, Ohio; Trenton, N. J.; and Worcester, Mass. The cooperative office at Omaha, Nebr., was discontinued.

The number of commercial inquiries handled by the district offices increased from 719,365 during the fiscal year 1923 to 967,620 in 1924. In 1924 there were 67,401 callers desiring information, as compared with 63,561 during the preceding year. The branch offices gave out 343,511 sheets of reserved information on trade opportunities and, in addition, 416,000 trade lists.

During the year there was put into effect a new arrangement (which has worked very well) providing that a cooperative office should work in close contact with the appropriate district office and obtain its material directly from that office. Certain cooperative offices, however, including Baltimore, Chattanooga, Cleveland, Cincinnati, Los Angeles, Newark, Norfolk, Portland (Oreg.), and Rochester, continue to operate under the old agreement, by which they receive from the bureau the same service as the district offices.

During the year a series of foreign-trade conferences were arranged through the district offices in a number of the larger cities

in their territories, the purpose being to bring the bureau's services directly to the attention of business men. Such meetings—of varying size and character but uniformly very successful—were held in Cleveland, Bridgeport, Springfield (Mass.), Worcester, Providence, Boston, Atlanta, Birmingham, Anniston, Montgomery, Mobile, Savannah, Jacksonville, Pensacola, New Orleans, Indianapolis, and St. Louis.

The examples of specific results obtained during the year through the efforts of the district offices are so numerous that only a few typical examples can be mentioned: The $10,000 worth of business obtained by a Texas flour company; the $25,000 business secured by a manufacturer's representative in New Orleans; the $80,000 in increased sales of a firm of international merchants in New York; $60,000 worth of business for a Chicago packer; $35,000 additional trade for a New England shoe company; $38,000 worth of flour business as a result of two trade opportunities furnished to an exporter by the Seattle office; $50,000 worth of business secured by a St. Louis company as a result of cooperation by the bureau's local office; $10,000 in trade gained by a machinery company in Kansas City; business "mounting into six figures" for a San Francisco electrical company through a single inquiry transmitted by the bureau, and many other valuable accounts for the same firm "as a direct result of activities of the bureau in its behalf"; business totaling $500,000 obtained by a leather-belting concern in California as a result of assistance rendered by the San Francisco office and by the bureau at Washington.

In the case of 3,675 of the inquiries addressed to the bureau (Washington office and district offices), the firms concerned reported resulting business amounting to $1,569,439, or an average of $427 per inquiry.

CLOSE AND CORDIAL COOPERATION WITH OTHER DEPARTMENTS

The purpose and effect of the liaison work of the bureau has been to eliminate "red tape" in the relations with other departments; to bring into personal contact the administrative officers of other Government organizations and the division chiefs of the bureau; to place before the liaison representatives of other departments the written reports of the bureau's field officers; to encourage close contact between those field officers and other Government departments through the weekly meetings of the economic liaison committee; and, in general, to create a new feeling of hearty cooperation between the various field officers of the Government.

A system was devised of utilizing a routing tag on every consular report received in the bureau for the purpose of obtaining first-hand comment from the division designated to take action on the report. As a result detailed comment on the quality and disposition of each report has been furnished for transmission to consular officers, generally within one week from the date of the receipt of the report in the bureau. In addition a periodical summary is made to the Director of the Consular Service on each 2,000 reports received and acted upon.

Much progress has been made in supplying consuls with clippings from the press, trade papers, and special circulars, giving the text

of their reports as published. It is believed that this has greatly stimulated consular officers to make better reports.

During the year much greater discretion has been used in sending questionnaires to consuls, so that only the questionnaires most pertinent for the consular district concerned are submitted for action. The replies to these specific questionnaires have been, in the main, highly satisfactory.

An adequate system of distributing reports from commercial attachés and trade commissioners to all departments of the Government has been devised and put into effect. A weekly list of reports received is submitted to the liaison officers of all the departments and reports that they request are made available to them.

One of the greatest accomplishments of the year was the agreement upon and putting into effect of the Executive order of April 24, 1924. This order provides, in brief, for an exchange of information between the field officers of the Department of Commerce and consular officers fortnightly on reports on preparation and those contemplated, so as to avoid duplication; that any field officers of the United States abroad may call upon any other field officer for information in the preparation of reports; for general supervision over the activities of all field officers by the chief diplomatic officer in the country wherein they are stationed; and for a general exchange of information between officers of the various departments, so as to avoid duplication in reporting and promote interests of the United States abroad.

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 offices in foreign countries, particularly in the Caribbean region and various trade centers in South America, where inadequate communication facilities make the establishment of branch offices very essential. With the settlement of the outstanding problems in Europe the bureau must have larger facilities for observing European competition in Latin America.
3. A larger appropriation for the work of the division of domestic commerce.
4. Adequate facilities for meeting the constantly growing demand for prompt and detailed statistical work, particularly as regards data on trade in specific commodities along the lines of the monthly statements now issued for chemicals and cotton and woolen textiles.
5. Legislation authorizing the bureau to send experts and exhibits to trade conventions and to charge fees for enrollment on the Exporters' Index.

Very truly yours,

JULIUS KLEIN, *Director.*

BUREAU OF STANDARDS

DEPARTMENT OF COMMERCE,
BUREAU OF STANDARDS,
Washington, July 1, 1924.

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:

COOPERATIVE ACTIVITIES

The bureau has official responsibilities in connection with many branches of the Federal Government, as well as with certain national organizations. Thus, the director is ex officio chairman of the Federal Specifications Board and of the National Screw Thread Commission, and a member of the National Advisory Committee for Aeronautics and the National Research Council. He is serving this year as president of the American Society for Steel Treating and of the Annual Conference on Weights and Measures, and on the executive committee as past president of the American Society for Testing Materials. The assistant director is a member of the President's Committee on Patent Policy. On the American Engineering Standards Committee the department is represented by the director, assistant director, and chief of the division on mechanics and sound. In the field of technology and science the director is chairman of several joint committees, such as the Joint Committee on Sulphur and Phosphorus in Steel, and the Committee on Welded Rail Joints, and is a member of others, including the Joint Committee on Molding Sand Research. The bureau is carrying out experimental work in cooperation with these and other national organizations, and members of the staff are serving on numerous committees of such organizations, representing many engineering, technical, and scientific activities of the country. The accomplishments of these cooperative activities for the past year will be found recorded under the appropriate headings of this report.

NATIONAL SCREW THREAD COMMISSION

During the past year eight meetings have been held, and a second report, to be known as the 1924 Report of the National Screw Thread Commission, is nearly ready for submission to the Secretaries of War, Navy, and Commerce for their acceptance and approval in accordance with the provisions of law.

The screw-thread standards established by the commission have already been widely accepted by the manufacturing industry, have

been approved by the American Engineering Standards Committee as an American standard, and their general acceptance and use constitute the greatest single step recently taken in standardization as applied to interchangeable manufacture.

FEDERAL SPECIFICATIONS BOARD

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

The board now has 65 technical committees at work on groups of related items of specifications, the several technical committees being composed of experts officially designated from the interested activities of the Government. The bureau has taken a prominent part in the work of nearly all of the technical committees, and the chairmanships of 24 committees are held by Bureau of Standards experts. In connection with the development and formulation of the master specifications a great deal of research work has been done. One hundred and sixty-two master specifications have been promulgated as official Government standards.

HANDBOOK OF SPECIFICATIONS

During the past year contacts have been established with organizations representing consumers and with organizations which speak for all of the major branches of industry and in some cases with the lesser branches of industry, both organized and unorganized. All trade associations and technical societies having national recognition known to be interested directly or indirectly in specifications have been communicated with, as have also more than 500 public purchasing agencies, as well as the Federal departments and independent establishments. More than 1,000 of these organizations have been requested to supply copies of their specifications for consideration in connection with the compilation of material for the dictionary or handbook of specifications.

More than 30,000 cards have been prepared for a preliminary classified index of the existing specifications now on file at the bureau. Work thus far has been concentrated on making as complete as possible the collection of existing specifications issued by the public purchasers and the nationally recognized trade associations, technical societies, and public utilities, and on making the classified index thereto as accurate as can be. The next step will be the selection of one or more thoroughly satisfactory well-recognized specifications for each of the important commodities.

How to determine the most satisfactory specifications and how to issue them in the most convenient manner for the use of the public purchasers are among the problems now being given consideration by a representative advisory board. This board is made up as follows: American Electric Railway Association; American Engineering Standards Committee; American Hospital Association; American Hotel Association; American Society for Testing Materials; Associated Business Papers (Inc.); Associated for Government Service; Chamber of Commerce of the United States; National Asso-

ciation of Manufacturers; National Association of Purchasing Agents; National Conference of Business Paper Editors; National Conference of Governmental Purchasing Agents; National Electric Light Association; and Society of Automotive Engineers.

AMERICAN ENGINEERING STANDARDS COMMITTEE

Three members of the Bureau of Standards have continued to represent the department on this important committee supported by the engineering organizations of the country. Under its procedure the bureau is "sponsor" or joint sponsor for 14 engineering standardization projects and is represented on 66 others.

PAN AMERICAN STANDARDIZATION

The projects on Pan American standardization of commodities of industrial and engineering interest which the department is fostering through a representative committee, whose chairman is a member of the Bureau of Standards staff, have been outlined and a tentative program drawn up for consideration at the forthcoming Scientific Congress in Lima, Peru, in December. Emphasis is being laid on standards and grades for raw materials, the products of the Pan American countries.

INTERNATIONAL COOPERATION

Dr. S. W. Stratton attended a meeting of the International Conference on Weights and Measures at Paris. To the international bureau has been delegated the task of a more complete correlation of standards of measurement among the signatory countries. The Bureau of Standards has also been in communication with the international bureau and other national bureaus looking to international agreements on (1) the temperature scale; (2) the ratio of the yard to the meter; (3) photometric units; (4) electrical standards; (5) radio standards; (6) X-ray standards and technique; and (7) sugar standards. The bureau was represented at the World Power Conference and the meeting of the International Electro-Technical Commission in London and at the meeting of the International Commission on Illumination at Geneva, Switzerland, as well as at meetings of the French and English Physical Societies, and at a wool-standardization conference in England.

AVOIDANCE OF DUPLICATION

Conferences have been held with directors of other bureaus, such as mines and chemistry, as well as with representatives of the Bureau of Efficiency and the chief coordinator, for consideration of borderland activities, and cordial understandings have been reached in practically all matters concerning which there had been uncertainties of jurisdiction and possibilities of duplication.

VISITING COMMITTEE

The membership of this committee the past year consisted of S. W. Stratton, president of Massachusetts Institute of Technology;

F. W. McNair, president of Michigan College of Mines; J. R. Freeman, of Providence, R. I.; Prof. W. D. Bancroft, of Cornell University; and A. Swazey, of Cleveland, Ohio. The committee has held two formal meetings at the bureau and several of its members have visited the bureau at other times.

SAFETY SURVEY AT BUREAU

During the year a survey of the bureau has been made by qualified members of the staff of the safety hazards at the bureau and steps taken to remedy them.

ADVANCED EDUCATIONAL WORK

As in past years, many members of the staff have taken advantage of the educational courses offered at the bureau and at the various colleges and universities located in Washington. This work has entailed no small sacrifice of time, energy, and money of the individuals, but it has been and will continue to be of value to the bureau through the development and increased usefulness of its staff. It is of interest to note that since the establishment of graduate courses of study in mathematics, physics, and chemistry at the bureau in 1908 there have been 22 members of the staff who have received the Ph. D. degree from 8 universities, including the University of Paris. Many others have profited from the bureau courses, of which there are usually 3 or 4 a year, with classes varying from 10 to 60 students.

SIMPLIFIED PRACTICE

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. Paints, varnishes, and containers.

The following recommendations are now in process of acceptance: Paper, lumber, brass lavatory and sink traps, steel barrels and drums, forged tools, blackboard slate, roofing slate, structural slate, bolts and nuts for farm equipment, hot-water storage tanks, asbestos paper and millboard, builders' hardware, and hospital beds.

Simplified practice recommendations are being considered for concrete blocks, cafeteria and lunchroom chinaware, refractories, steel lockers, steel reinforcing bars, warehouse forms, oil-storage tanks, sheet steel, terneplate, eaves troughs and conductor pipe, shovels, furnace parts (registers for warm-air furnaces), window sash and doors.

Surveys of existing varieties are in process for the following industries: Automotive parts; gas water heaters (side arm and flueless types); copper boilers; hydropneumatic tanks; house tanks for cold-water storage; hacksaw blades; copper and brass products; screw drivers; pocket knives; refrigerator hardware; collapsible tubes; loaded shells; dental supplies; cotton fabric colors; wood handles for

tools; lock washers and nut locks; rubber heels; drills and reamers; milling cutters; clay products; taps and dies; grocery bags; boxes (color and sizes) for gloves; underwear, hosiery, etc.; oil burners; elevated steel tanks and towers; manhole frames and covers.

A publication has been issued on the organization of the American Marine Standards Committee and its constitution and rules. It describes the field, objects, organization, and mode of procedure of this committee, which has been making steady progress in the work undertaken in 1923. A general conference of this committee was called on May 5, 1924, to consider existing specifications for condenser tubes and ferrule stock and to adopt recommendations for a common standard for marine use.

A member of the division's staff has just completed the preparation of two reports on utilization of waste in the lumber industry, one of which covers a survey made in the Pacific Northwest, while the other deals with the situation in the Southern States.

BUILDING AND HOUSING

A survey of seasonal operation in the construction industries was the principal new activity of the division of building and housing during the year. The work on building codes, plumbing codes, city zoning, statistics, and service for the home owner continued logically from the work of the preceding year. The cooperation of trade associations, professional, scientific, and civic societies, and other bodies of citizens interested in construction, housing, and civic improvement, has helped to make the results of the division's work of maximum benefit throughout the entire country.

The study of seasonal construction developed the fact that seasonal irregularity in building activity was due more to custom than to climate. The average building trades worker customarily loses from a fourth to a third of his available working time during the year, and contractors' organizations, material manufacturers, and others connected with the industry suffer similarly. Constructive remedies based mainly on what has been accomplished in various communities were evolved, and the suggestions are being carried out in many communities.

The building code committee prepared for publication its reports on Masonry Walls and Floor Load Requirements and made substantial progress on other reports. The plumbing code committee issued its Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings, and indications were that its provisions would be utilized in many State and local plumbing codes. In most localities where there are already plumbing codes its adoption will permit savings of from $50 to $200 per house over present practice, at the same time giving better assurance of safe and sanitary systems. The advisory committee on zoning published A Standard State Zoning Enabling Act, on which acts adopted in at least 13 States have been wholly or largely based. It is expected that the general use of this will simplify the legal status of zoning in the United States.

Increasing use has been made by the construction industry of the building-material prices and other current statistics which have been collected and published. Members of the division prepared the

articles on "Construction" and "Construction materials other than lumber" for the Commerce Yearbook.

How to Own Your Home, a 28-page pamphlet for the guidance of home seekers, was published in September and has had a sale approaching 300,000 copies; in addition, sections of it have been very widely reprinted in newspapers and periodicals. At the close of the year a study of home financing was commenced. With the incorporation of Better Homes in America as an independent organization for public service, and the transfer of its headquarters to Washington, cooperation with it became closer. In May, "Demonstration homes" were conducted in several hundred cities and rural communities.

WEIGHTS AND MEASURES

The investigation of orifice meters for the measurement of large quantities of natural gas has been continued and is nearing completion. All measurements will be finished within the next few months, and the calculations and preparation for publication will be completed within the present year. A closely related problem, namely, the test of large volume gas meters, is also well under way. This work is being carried out in Chicago in cooperation with a joint committee of the American Gas Association and the Natural Gas Association of America.

Good progress has been made in the work on precision screw cutting and the construction of a precision linear dividing engine for graduating short scales and gratings. A screw of the required accuracy has been completed, and the bed, carriage, and other parts of the dividing engine are well under way. When completed this machine, it is hoped, will be capable of producing precision rulings over an interval of 20 centimeters (8 inches), with an accuracy of better than one-tenth of a micron.

Nineteen master scales and 1,019 commercial track scales, distributed over 37 States and the District of Columbia, were tested. The number of tests completed represents an increase of 13.9 per cent over the best previous year, accomplished without increase of funds, equipment, or personnel. It did, however, involve a practical discontinuance of certain other vitally important work, for example, the design and improvement of large capacity weighing equipment and the development of specifications and tolerances.

Of the track scales tested 56.9 per cent passed the tolerance prescribed by the bureau for good performance. This represents a substantial improvement over the figures for 1923 and is the highest percentage of satisfactory performance since the work was begun in 1914. Since this work was first undertaken there has been a consistent improvement from 38.2 per cent for the first year to 56.9 for the year just closed.

Circular No. 154, National Standard Petroleum Oil Tables, has been completed and has been accepted by the Bureau of Mines, Bureau of Standards, and the American Petroleum Institute. The use of these tables will eliminate the confusion and uncertainty that have heretofore existed as a result of the use of two conflicting hydrometer scales.

A detailed study of sieves and sieve cloth, in cooperation with manufacturers of standard sieves, has resulted in a noticeable im-

provement in this product which is widely used in the test of Portland cement, sand, and other finely divided materials of importance in engineering practice.

Through the activities of the gauge section the bureau has been unusually successful during the past year in establishing contacts with the manufacturing industries and in applying its facilities to the solution of problems of industrial importance. This has been accomplished through cooperation with the National Screw Thread Commission, the Sectional Committee on Plain Limit Gauges for General Engineering Work, and the Gauge Steel Committee.

A research on the density of denatured alcohol, carried out at the request of the Treasury Department, was completed and furnished information necessary for the proper supervision and control of the preparation and distribution of denatured alcohol for industrial purposes.

Work on dental inlay materials, carried on under a research associate arrangement, is well under way and when completed will cover this field in the same thorough manner as the field of dental amalgams was covered four years ago.

The 1924 annual conference on weights and measures was probably the most successful one every held. Bread-weight legislation, both State and national, was discussed at length as a result of the recent decision of the United States Supreme Court on the Nebraska standard-weight bread law; specifications and tolerances for fabric-measuring devices were adopted; existing codes of specifications and tolerances for weighing and measuring devices were modified in the light of experience, and further action was taken in the development of specifications and tolerances for vehicle tanks and taximeters.

The usual large amount of testing work was done by those sections in which this work naturally falls; namely, length, mass, and capacity and density. While this work has been kept as nearly up to date as our limited personnel would permit, an objectionable delay in some cases has been unavoidable. This delay acts as a check upon the quantity of apparatus submitted for test, and tends to restrict a line of the bureau's work which could to advantage be allowed to increase to several times its present volume.

ELECTRICITY

An important part of the bureau's work in electricity is concerned with fundamental investigations of electrical standards from which the working standards used by manufacturers of electrical apparatus are derived, and several fundamental investigations are in progress. A new determination of the ohm in absolute units, a determination of the ratio of the international to the absolute henry, and the design and construction of an absolute electrometer for measurement of voltages up to 250,000 are well advanced.

The accuracy of radio-frequency standards and measurements was materially increased during the year, and the broadcasting and other stations were directly aided in holding their frequencies constant by the establishment of standard frequency stations, by measurements of station frequencies at the bureau laboratory, and by the transmission of standard frequency signals from the bureau station WWV.

Two advances in radio beacons were made. One was the completion of the development of a directive system which enables a ship or aircraft to follow a specific course with the aid of ordinary receiving apparatus. The other was the construction of a low-power beacon apparatus which will be placed in service on buoys and may become an important new aid to navigation.

In cooperation with Government and manufacturing interests, the electron tubes used in radio and methods for testing have been standardized. Applications of the tubes have been made in numerous practical radio receiving problems.

At the request of the Bureau of Entomology, Department of Agriculture, a cooperative investigation has been begun on the electric effects which are produced when insecticide dust is sprayed over a field. There seems to be considerable evidence that the electrified condition of such dust may increase its effectiveness and thus materially reduce the amount and cost of the poison which must be used per acre.

An investigation of nondestructive testing of wire rope, for which appropriation was made by Congress, has been actively prosecuted. The magnetic method of testing appeared to be most promising and has received a great deal of study as a nondestructive method for testing iron and steel products. It was at once recognized, however, that no magnetic method has yet been developed which gives results that are unambiguous and capable of definite interpretation. It was therefore necessary to make investigations of a basic and fundamental nature to establish the relations between magnetic properties of wires used in wire rope and the effect of the various causes of deterioration in wire rope arising from service conditions. A study of the effect of mechanical stress on the magnetic properties of steel wire has been completed, and an investigation of the effect of wear is nearly completed, while work is in progress on the effects of fatigue and corrosion. The design and construction of apparatus for field tests have been begun.

The surveys of the Government's telephone service in the District of Columbia and in the field, under the auspices of the Bureau of the Budget and under direct supervision of the chief coordinator, have been continued. An additional annual economy of $6,777 was effected over the $62,000 reported last year, thus bringing the total annual economy as a result of the survey work up to nearly $69,000. In addition there was a single saving of $2,831.50 which, added to previous single savings, makes a total of $7,590.74. There are in sight additional economies of nearly $26,000 per annum. In no case has the quality of telepone service been impaired as a result of the bureau's work.

Important progress has been made in the revision of the National Electrical Safety Code and the preparation of the Aeronautical Safety Code, the Safety Code for Elevators, the Code for Protection Against Lightning, and the Code for Colors of Traffic Signals. The National Safety Code for Logging and Sawmill Operations was published during the year as No. 5 in the bureau's handbook series, and is approved as an American standard by the American Engineering Standards Committee.

The second edition of Circular 56, Standards for Electric Service, was published early in the year, and a survey of street-lighting prac-

tice in municipalities of 10,000 population and over is nearing completion. The second annual conference of engineers of public-utility and railroad commissions was held in March and attended by engineers representing 16 States.

In 1922 an extended and continuing investigation to determine the causes and mechanism of the corrosive action of various kinds of soil on underground pipes was started. About 13,000 specimens have been buried in 46 typical soils throughout the United States selected by the Bureau of Soils, Department of Agriculture. During the year about 900 specimens have been uncovered and returned to Washington for examination and study. Results so far obtained indicate that in certain soils in the South and Southwest initial corrosion of iron and steel is rapid. It has also been found that lead is seriously corroded in a few localities.

A cooperative investigation with a special committee of the American Society of Civil Engineers on impact in highway bridges has been carried on for some time. A 12-element electric strain gauge has been constructed under the bureau's supervision, and field tests are now in progress at Ames, Iowa.

HEAT AND POWER

A conference with the standardizing laboratories of England, Germany, and the Netherlands followed by correspondence through the International Bureau of Weights and Measures has led to substantial agreement as to a uniform international temperature scale. This agreement probably will be formally ratified in the near future.

A research on the properties of saturated steam and water, undertaken with the cooperation of the American Society of Mechanical Engineers and now well under way, is designed to yield data of high accuracy on fundamental physical constants, while at the same time the data will find immediate application in the solution of modern problems of steam engineering.

A completed research on the fire resistance and general effectiveness of curtains used in theaters to close the opening between the stage and the auditorium, in case of fire on the stage, has developed conclusive information as to the types of curtains necessary to afford adequate protection to the audience.

There has been a national awakening of interest in the importance of adequate braking systems on motor vehicles. A recording and an inspection decelerometer were developed at the bureau to permit measurements of the braking ability of automobiles. Representatives of the bureau have been invited to explain and use these decelerometers at demonstrations in several of the larger cities. The result has been increased information among city officials and the public, which will promote greater safety of traffic.

A research has shown that heavier grades of gasoline could be used in average service with resulting economy in the operation of motor vehicles throughout the country, except for certain limiting factors, such as crank case oil dilution and starting difficulties. These are being studied with a view to an increase in economy of motor transportation.

Routine testing of instruments and materials makes basic standardization work available to the industries and the public. Work

of this nature has outgrown the facilities provided for it with the resulting necessity of refusing work urgently needed by the industries and of holding tests on hand for long periods. This has led to very severe criticism from the industries involved. It is of utmost importance that more adequate facilities be provided.

The disastrous explosion which occurred in one of the altitude test chambers in September emphasized the need and suggested possibilities of modifications in the design of these units which would further reduce the chance of a repetition of such an accident. A special appropriation of $72,000 has made it possible to remodel the equipment embodying the important added safety features. When this work is completed the operating staffs of the three altitude test units will be safeguarded so far as can be foreseen from the danger of explosions occurring within the chambers.

OPTICS

Certain physical and chemical properties, such as valency, atomic volumes, expansion coefficients, boiling points, etc., exhibit periodicities in the system of chemical elements. Very recently emission arc and spark spectra have been shown to possess similar periodic characteristics throughout the eight groups of elements. Last year we announced for arc spectra the verification of the alternation law which states that even and odd groups of spectral lines alternate across the periodic table. This year we have announced the verification of the displacement law which states that the spark spectrum of any element resembles in structure the arc spectrum of the element just preceding it in the column to the left.

Rowland's epoch-making table of solar spectrum wave lengths, which has been standard for more than 30 years, was recognized as inaccurate at least 20 years ago. In cooperation with the Allegheny Observatory, we have undertaken a complete standardization of the solar spectrum, based on the international system of units. A portion of the spectrum in the blue and violet was measured this past year with a precision of about 1 part in 5,000,000. This program is planned to cover a period of 11 years so as to reveal any variation which may arise during a sun-spot cycle.

For many years one of the most important needs in the manufacture of sugar has been an accurate and a practicable method for the determination of the amount and character of color in the various stages of the processes utilized. The problem has recently become more acute because of the development and introduction of new decolorizing carbons. Intensive study of the subject has been made, beginning with the fundamentals of color measurement and their application to the sugar industry, and involving the combined physical and chemical characteristics of the materials used in the factory. The reason for the failure of the methods of color estimation now in use has finally been determined. The spectral character of the color of the actual sugar liquors obtained during factory operation has been accurately determined, with the result that heretofore inexplicable difficulties encountered in factory processes have been explained. From the facts developed, what appears to be a practicable and relatively simple method of color measurement in the

sugar factory has been worked out. The results obtained promise to be of unusual value to the carbohydrate industries.

It is believed that the long-existing troublesome uncertainties of heterochromatic photometry have finally been conveniently eliminated by the design of a rotatory dispersion colorimetric photometer. This instrument measures the relative intensities of two different light sources under conditions of an exact color match, and also serves for the color grading of light sources.

The most complete and accurate investigation so far made of the aberrations of photographic lenses, covering the spherical aberration, departure from the sine condition, astigmatism, curvature of field, distortion, axial and lateral chromatism of 41 different high-grade objectives, was completed. From the results conclusions can be drawn regarding the uniformity of photographic lenses as commercially produced and the types of correction which are characteristic of the different objectives.

The application of the principles of thermal radiation to roofs and canopies, on the one hand, and to heaters, on the other, has aroused much interest as indicated by the volume of correspondence on that subject.

A quantitative investigation of the germicidal effect of ultraviolet radiant energy has been made, which deals with the amount of killing as affected by wave length and intensity of the radiation, and also time of exposure. One of the important results of this investigation is the conclusion that waves longer than heretofore reported are found to be germicidal, if the time of exposure given is sufficient.

It is gratifying to note the increase in sensitiveness and quality of some of the photographic plates and films during the last two years. We believe this is due, in part, to the publication of the characteristics of domestic plates and films (Scientific Paper No. 439). Many of these products have been more than doubled in speed.

About two years ago this bureau ruled for a leading manufacturer, by interference methods, some 6-inch master scales sufficiently accurate to eliminate the use of correction charts. This company reports the release from the necessity of applying corrections to be highly gratifying and urges the bureau to expedite its plans for ruling larger scales with similar precision.

CHEMISTRY

The work of the chemistry division has included the usual great variety of tests and investigations. A large number of specifications have been prepared, covering bituminous roofing materials, rubber, inks, and typewriter ribbons. Thousands of tests have been carried out on bid samples and deliveries of Government purchases, resulting in the saving of large amounts of money to the various departments.

A process has been developed for the rapid and economical reclamation of gasoline used in dry-cleaning establishments, and the method is now in successful operation in several plants. The success of this undertaking was largely due to the close cooperation of the industry with the bureau, and illustrates the value of the bureau's research associate plan.

Nine new standard samples were prepared, standardized, and distributed, and four exhausted samples were renewed during the year. This is an unusually large number and involved a great deal of work on the part of the bureau and the cooperating analysts.

Several new refined and routine methods for inorganic analysis were developed, and a number of methods for the analysis of the alloys of the platinum metals were worked out.

In the field of electrodeposition, work on the general principles of "throwing power" (the ability of an electroplating solution to deposit in recesses) has been continued. The general distribution and throwing power of various typical nickel-plating solutions have been determined. This research has also afforded valuable information upon cathode potentials and current efficiencies in nickel solutions.

An apparatus for the analytical separation of gases into their constituents by fractional distillation has been developed and has proved of great value in the study of a standard method for the determination of gasoline in natural gas, which has been carried out in cooperation with the Natural Gas Association.

This division has also developed apparatus for the absorption of gases in liquids. This is capable of showing definitely the course of a reaction lasting not more than one-tenth of a second.

A critical review of the literature dealing with the relations between densities, pressures, and temperatures of gases has been prepared. This publication is especially designed to be useful to the general public without sacrificing scientific accuracy or completeness.

Several methods of testing gas appliances have been developed to meet the need for better protection of the public against poisoning by carbon monoxide. The application of these methods to the study of appliances already has been of great assistance to many manufacturers.

MECHANICS AND SOUND

An investigation of elevator interlocking devices, requested by the city of Baltimore, was continued through the past fiscal year. Effective elevator hoistway door interlocks would, according to statistics, eliminate about three-fourths of the elevator accidents fatal to the public. While most modern elevator codes make the use of such devices mandatory, at least for passenger elevators, the approval of the particular devices used has been based principally on a visual inspection. The purpose of this investigation is to develop test methods for determining the fitness of such devices by actual reliability performance tests. The formulation of test requirements for each of several operating conditions has been further developed, and a number of additional devices have been tested. The results have shown very definitely the inadequacy of a visual inspection. Another result has been an increase in the number of interlocking devices which may be considered as acceptable in the present state of the art. The manufacturers have been quick to apply the information developed and to redesign their apparatus where this has been shown necessary.

A comprehensive investigation of wall and floor construction which will prevent sound from being transmitted appreciably from one

room to another is now under way, the experiments being conducted in a sound chamber especially constructed for the purpose. Measurements are made through panels sealed into a corresponding opening in the large sound chamber. The first measurements have been made with panels simulating present-day wall construction, both lime and gypsum plaster being used. The work is being carried on in cooperation with the National Lime Association and the National Gypsum Association.

In cooperation with the Coast and Geodetic Survey, a method has been developed for locating accurately the position of a surveying ship when the visibility is so poor that the coast can not be seen. The method employed involves the combined use of acoustic and radio signals. A small bomb is exploded near the ship, the instant of the explosion being recorded on a chronograph on board. The sound wave produced by the bomb is picked up by underwater microphones located at two or more known positions along the shore. When the sound signal reaches the microphone it is automatically sent back to the ship by radio, where the instant of its arrival is recorded on the chronograph. In this way the time required for the signal to travel from the ships to each shore station can then be found by multiplying the time by the speed of sound in sea water. With this information the position of the ship can be quickly determined. The method is now in daily use by the Coast and Geodetic Survey in connection with sounding operations off the Pacific coast. Formerly surveying operations were often limited to five or six days in each month, due to the visibility being so poor that the shore stations could not be seen.

In cooperation with the National Advisory Committee for Aeronautics, measurements have been made on the aerodynamical characteristics of airfoils at high speeds for the purpose of obtaining data for use in designing airplane propellers. The investigation was made at the Lynn Works of the General Electric Co., where large centrifugal compressors were available for supplying a high-speed air stream. Measurements were made on six airfoils at varying wind speeds, which in some cases approached the speed of sound. The aerodynamical characteristics of the airfoils at high speeds were found to be radically different from those obtained at low speeds, and it is believed the results will be of marked value in propeller design.

An extended investigation is in progress on the strength of 8 and 12 inch masonry walls, constructed from common and medium brick, sand-lime brick, and building tile. Three kinds of mortar are also being tested, including lime mortar, cement mortar, and a mixture of lime and cement in equal parts. Test walls 9 feet high and 6 feet long are constructed, allowed to age 60 days, and then loaded to failure in the 10,000,000-pound testing machine. The results will provide definite information regarding safe loads for different types of wall construction.

During the year the 10,000,000-pound vertical testing machine (the largest testing machine in the world), which had been moved from the old branch laboratory at Pittsburgh, was set up in the Industrial Building. The large Emery high-precision machine was moved from the basement of the West Building to the Industrial Building, this being a particularly difficult job because of the relative

situation of the two structures and the great weight and size of some of the parts.

The 600,000-pound machine from Pittsburgh and the small Emery machine were also set up in their new locations in the Industrial Building.

All this work was carried out by the bureau's staff, and the results have been highly satisfactory.

Progress has been made in connection with the investigation of welded rail joints. Tensile tests have been made in the large Emery machine, and the anvil and other equipment for the repeated impact tests have been installed. The circular test track, however, has not been built as yet, because of the high cost of construction.

In cooperation with the Bureau of Construction and Repair of the Navy Department a study of stress distribution and elastic action in riveted ship-plate joints has been started.

Work is in progress on the standardization of builders' hardware for Government as well as private use. Surveys are being made to insure the adoption as standard of those items found in general commercial production. The Advisory Committee on the Standardization of Builders' Hardware, consisting of representatives of the prominent manufacturers in this field, in cooperation with the Bureau of Standards, has completed the first stage of standardization work by preparing and adopting a comprehensive report on builders' hardware which, on a conservative basis, eliminates 26 per cent of the items manufactured in 1922. One of the outstanding accomplishments of this work is the setting up and adoption of 29 standard finishes in place of 100 nonstandard finishes formerly used. Standard finish samples are held at the bureau for reference.

STRUCTURAL, ENGINEERING, AND MISCELLANEOUS MATERIALS

In cooperation with the Portland Cement Association, the joint committee on concrete and reinforced concrete, and a committee of concrete contractors, a very thorough field test was carried out on two major building operations to establish a means of introducing into practice some of the improvements in the technique of concrete making which recent researches have indicated to be desirable. The investigation also gave very interesting results as to the quality of the concrete which was being made on these jobs from hour to hour. In general the results showed that a very high quality of concrete was obtained. In the one case the average strength of the 1:6 concrete was 2,200 pounds per square inch at 28 days, and in the other job the concrete of the same proportions, but of different materials, gave 3,150 pounds per square inch. The maximum variations of the daily averages of strength were 23 per cent below and 34 above the grand average in the one case, and from 47 per cent below to 30 above in the second case. While these variations may seem large, yet, in general, they were less than had been predicted for work carried on under these conditions.

Two other notable pieces of work were those dealing with the workability of concrete mixtures and with colorless waterproofing materials for stone in particular. The data obtained in the last-named work indicate that those materials which utilize paraffin.

aluminum stearate, or mixtures of paraffin with china wood oil give good waterproofing values when properly applied. A special feature of the work in connection with the study of the workability of concrete mixtures consisted of incorporating various admixtures into the concrete mixtures and noting the effect of these. The results show that the workability of a concrete mixture is about equally benefited by 1 part of celite, 2 parts of kaolin, or 3 parts of hydrated lime such as used in these tests, if the consistency as measured by the flow table is kept constant. These mixtures in the proportions used did not seriously affect the strength of the 1:2:4 or leaner mixtures.

Because of the testing of all the cement for the Muscle Shoals Dam, the total quantity tested by the bureau was considerably greater than last year, the total being 1,293,158 barrels. In addition to this testing of cement, a very large amount of testing of concreting materials was carried on for the other Government bureaus.

The final results from the investigation to determine the comparative durability of chrome and vegetable-tanned sole leather indicate that it would be economically advantageous to utilize the superior wearing qualities afforded by the chrome method of tanning, and that this might be accomplished by developing methods of rapidly retanning chrome leather with vegetable tanning materials in order to secure the desirable properties other than relative wear which the chrome-tanned leather does not possess. There is no question, however, that the chrome-tanned leather gives decidedly better wearing qualities than vegetable tanned. The investigation of synthetic tanning materials has shown that it is possible to obtain some excellent leathers, possessing good color, firmness, flexibility, and great strength, but lacking in that fullness and weight required of certain heavy leathers. It is believed that this desired fullness can be obtained by developing the correct method of applying these newer tanning agents.

A second paper on power losses in automobile tires (Technologic Paper, No. 240) has been issued. These losses have been determined on a large number of tires and the comparative results are given for the 3½, 4, and 5 inch sizes, both cord and fabric. The analysis of the results showed that the carcass is responsible for the greater part of the loss. Tests made on about 20 of the new balloon type of tires show that the rolling resistance is greater than for high-pressure tires when each is operated at its recommended pressure.

In connection with the study of the heat-retaining properties of fabrics, in addition to the measurement of heat transmission, the permeablity of the fabrics to air and water vapor was determined because of the effect which it might have upon the passage of heat through it. As a consequence three different sets of apparatus were designed and sufficiently perfected to be considered finished pieces of laboratory apparatus. However, not enough types of fabrics have been studied to permit drawing general conclusions, but it has been shown that the apparatus would be satisfactory for this purpose.

The apparatus for testing the wearing qualities of textiles has been modified so that it is now possible to use it for testing a wide variety of textiles on the market. It has been used during the past year for a study of the effect of changing the number of plies in

serges, with the yarn size and weight of fabric remaining the same. This particular investigation showed that there was a material difference in the abrasion of a 2-ply yarn over single yarns and also that the effect of repeated stress was materially changed when the number of plies in the yarn differed. Some overcoatings and carpets which had been specially treated were compared on this apparatus with the untreated samples and showed the superiority of the former over the latter. A short study of the effect of reworked wool in wool fabrics was made and showed that it was possible to use reworked wool in fabrics and secure a fabric which would wear better than one containing all virgin wool.

A study of foreign and domestic clays as paper fillers was made and included the determination of the amount of clay retained in the paper, the quality of the paper produced, and a study of the physical properties of the clays that might influence the paper-making process of the finished product. The results show that with the proper manipulation of the paper-making machinery the amount of the domestic clay retained in the paper and the quality of the paper containing the domestic clay are, in general, the same as the foreign clay. However, the color and the amount of grit favor the foreign clay.

The rapid increase in the use of gypsum products led to an investigation of gypsum, its manufacture into the large variety of commodities in which it now appears on the market, and the service obtained from these. The effect of the composition of the original gypsum on the propertes of the plaster and studies of gypsum hollow tile, with particular reference to the relation of absorption, expansion, compressive, and transverse strength, were two of the major problems investigated.

A number of plaster failures have been investigated. The cause was generally found not in the material itself but the attempt to use it without a proper knowledge of its qualities and of the variation in the material which may be present from time to time. There is marked evidence that the industries selling these materials would accomplish a great deal of good through their service departments by a system of education for the workmen covering the use of the commodities they are placing on the market.

METALLURGY

One new major project of fundamental importance, the study of the atomic structure of metals by the X-ray spectrograph, has been instituted. All other major projects are continuations of investigations previously begun.

Of these, the work on the standardization of methods for testing the resistance to corrosion of metals and alloys and the collection of experimental data on the subject is of prime importance. This work has been carried on in cooperation with the American Society for Testing Materials.

Next in industrial importance is the study of the properties of metals and alloys at high temperatures. Engineering calls for increased use of metallic materials at high temperatures and pressures, and the data necessary are rapidly being collected in cooperation with

the American Society of Mechanical Engineers and the American Society for Testing Materials.

Gratifying progress has been made, in cooperation with the Naval Gun Factory, on the work with high-speed steels and on the machineability of steel.

The very fundamental problem of gases in metals has received much attention and real progress has been made. Very interesting results have been obtained in the work for the Joint Committee on Sulphur and Phosphorus in Steel.

In cooperation with the Gauge Steel Committee and Army and Navy progress has been made in the work on the durability and permanence of gauges.

The work on covering materials of all sorts with metallic coatings by spraying, primarily for the Army and Navy, has had marked success. A special portable truck carrying a self-contained metal spray outfit has been rigged up for the Army Air Service. Several spray guns have been built and delivered to different branches of the Navy and several very useful applications of metal spray to Navy problems have been worked out.

The work on the preparation of pure platinum and of special refractories for the melting of platinum has continued with steady success.

In the study of metallic material which has failed in service or in connection with questions which can only be answered by metallurgical study, work has been done for the Naval Gun Factory, Panama Canal, Veteran's Bureau, Post Office Department, National Advisory Committee for Aeronautics, Emergency Fleet Corporation, many branches of the Army and Navy, and the Department of Agriculture. For example, a method for the restoration of obliterated identification marks on revolvers used by criminals has been worked out and has been a real aid to justice.

CERAMICS

Work has been started to obtain physical-chemical constants for the study of clays for specific purposes, and also applicable in processes of their purification, and constants for the regulation of clay bodies for forming the various ceramic wares. The first phase of the work related to the degree of acidity or alkalinity of the water phase of the clay-water system, as determined by the hydrogen electrode. At the present time the problem is being attacked from a slightly different viewpoint, namely, that of removing the contained soluble electrolytes from the clay and studying the qualities of the resultant purified clay.

All ceramic wares must in some part of the process of manufacture have removed by drying treatment the water used in working up the clay. The resistance of different clays and bodies to giving up this water varies very markedly, and the effect upon the mechanical properties of the body also differs greatly. As a consequence, one of the most important phases in the manufacture of ceramic materials is the drying process, yet this has never until now been studied systematically. The work along this line at the bureau has been concerned with determining the effect of the drying treatment on the strength and other physical properties of the ware. Data

have been obtained on the rate of moisture diffusion through clay, the rate of removal from the surface, and the rate of temperature rise within a body while being dried under different humidity conditions. It was noted that, in general, the removal of the last per cent of water increased the dry strength from 50 to 100 per cent.

Approximately 5,000 samples of glazing glass (2 by 18 inches) of various types were tested for strength by transverse loading and impact. The modulus of rupture varied from 5,000 to 13,000 pounds per square inch and the Young's modulus from 550,000 to 16,670,000 pounds per square inch, depending upon the type of glass. Tests were also made on 12 by 12 inch pieces of glass mounted in frames and loaded at the center. The results show that the strengths of these sheets approximate very closely that which may be concluded from the strengths obtained by testing transversely strips 2 by 18 inches when tested as a beam supported at two ends.

A progress report on specifications for refractories, with special reference to stoker-fired boiler settings, has been prepared. The data were obtained in testing 42 brands of representative refractories, which were obtained through the cooperation of Stone and Webster from various power-plant installations. The results indicated that a refractory which would successfully withstand 15 quenchings from 850° C. to running water also had a softening point equivalent to at least that of cone 32; that the per cent linear change in the endurance test would not exceed 2 per cent, and the deflection in the same test, when transversely loaded, would not exceed 0.3 of an inch; that the per cent absorption after the constant volume test would lie between 6 and 10 per cent; and that the refractory should contain not more than 4 per cent flux and 20 per cent uncombined quartz. A short investigation which was primarily a study of the relative value of clay and high alumina refractories was also carried out with some refractories for rotary cement kilns.

The results of a series of tests on slabs of hollow tile with reinforced concrete ribs indicated that the bond between the concrete and the tiles was sufficient to cause the tiles to assist materially in taking both bonding and shearing stresses. When medium or hard tile were used it appears that the shells of the tiles which are in contact with the concrete are as effective as an equal width of concrete.

At the suggestion of the Hollow Building Tile Association the bureau has undertaken a study of the efficiency of hollow tile and brick extrusion machines. This rather complex problem is now under way, and the apparatus and equipment necessary for a study of the various types of auger machines are being developed. The preliminary study of the problem shows that one of the principal difficulties will be the development of the necessary apparatus. This is due to the crudeness of the machines and to the difficulty in obtaining a constant maximum load torque for a sufficient length of time to make observations.

The relation between enamel composition and such properties as strength and acid resistance, as well as the effect of the relative coefficients of expansion of the ground and cover coats on resistance of the enameled ware to impact and thermal shock, have been studied and the results published.

There is an increasing use of the wet process of enameling in the industry. However, the technique and the compositions required for

this type of enamel are not well known. As a consequence, the bureau in connection with a commercial plant carried on an extended piece of work which has been published in Technologic Paper No. 246. A number of compositions were worked out which have given very satisfactory results in the factory on such pieces as oven and broiler fire doors, oven-burner plates, flue doors, brackets, and other types of cast-iron ware.

THE OFFICE

During the year the office expended and accounted for funds aggregating $1,804,930, including $136,705 by transfer or reimbursement. Personnel actions involving 1,616 staff changes were handled for the 836 bureau employees, the staff status records being maintained up to date. The turnover by separation amounted to 33 per cent for the scientific, 37 per cent for the clerical, and 25 per cent for the construction employees, respectively.. The bureau editorial committee received and considered 298 manuscripts prepared by members of the bureau staff for publications; 69 new publications on bureau researches were actually published. In addition 26 technical letter circulars and 12 technical news bulletins were prepared and distributed; 130 publicity items were prepared in the office for the newspapers. A new system of announcements of new publications, a revision of the bureau's mailing list, and a new policy with respect to document distribution received careful attention during the year. The resulting system has been found practical and effective in service. All bureau publications will be placed upon sale by the Superintendent of Documents and sales stock maintained as long as the demand continues.

With the new accessions of the year just ended, the bureau's scientific library now contains 27,000 volumes and receives 646 technical and scientific periodicals from all parts of the world. Its book circulation has increased 20 per cent. The bureau's library is especially rich in primary sources in physics and the special technologies within its field. For the procurement of the special equipment and supplies, much of it unique or highly specialized, a technical catalogue library of 16,000 scientific, engineering, and industrial catalogues is maintained under the care of an experienced procurement clerk. During the year 5,275 special orders were placed, in addition to requisitions for restock of staple supplies; 6,500 vouchers were audited and prepared for payment; and 2,580 pieces of scientific apparatus and other equipment were accessioned and placed in service. A total of 15,964 shipments were prepared and dispatched, consisting largely of scientific instruments tested by the bureau. The maximum freight movement was 69 tons in one day. The daily mail received at the bureau amounts to more than 1,000 pieces of all kinds. During the year the bureau made 135,852 tests, an increase of more than 20,000. For these the necessary routine and records are cared for in the central office. Communications between the 17 buildings in the bureau group is maintained by messenger service and telephone system. The latter includes a central switchboard with 10 trunk lines, 1 tie line, and 300 active telephone stations in the various buildings.

OPERATION AND CONSTRUCTION

During the year some new equipment, such as carbon-dioxide recorders for the boiler flue gases, two transformers for electric furnaces, and a new vacuum pump, were installed.

New electric wiring was supplied in some of the laboratories, and the necessary repairs were made to plumbing and fixtures.

Work is well advanced on a new concrete stairway to connect the group of buildings on the hill with the Industrial Building, and a concrete road back of the East Building was completed. Several smaller construction jobs were also carried out, and the usual work was done on improving the bureau's grounds.

The regular construction work in connection with scientific instruments and apparatus was carried out in the bureau's shops. Lenses and glass laboratory equipment and photographic services were likewise furnished.

GENERAL RECOMMENDATIONS

PERSONNEL

The new reclassification schedule became effective on July 1, 1924. This undoubtedly will be of considerable benefit to a portion of our personnel. On the other hand, since the total appropriations for the bureau remain at almost the same figure as for the year just closed there will be some reduction in the staff. It is to be expected that this will be reflected in the total amount of work turned out during the coming year, although it is also probable that the increased salaries, especially of the scientific and technical staff, will make for greater stability and contentment and thus result in a correspondingly greater output per individual.

It is hoped that next year the Congress will feel able to provide sufficient funds to make up at least the deficit in personnel brought about by the inadequacy of funds to provide completely for reclassification.

During the year most of the important vacancies were filled in the scientific staff, including the position of chief of the division of metallurgy, but a number of resignations have taken place which have seriously affected the work.

ADDITIONAL LAND

As pointed out in previous reports, the main entrance to the bureau's property is through privately owned land. The land between the present site and Connecticut Avenue should be acquired in order to give a proper entrance and to make provision for future development. Since this land is rapidly increasing in value, it is in the interest of economy to purchase it at the earliest possible moment and particularly before it is built upon.

POWER PLANT

The urgent need for a new central power plant to supply the bureau still exists. For several years the bureau has been forced

to get along with a very inefficient and decentralized mechanical plant, consisting of the original power plant designed to supply two buildings, two additional boiler plants for heating, and numerous pieces of electrical machinery scattered through the various buildings.

The efficiency of such an installation is necessarily very low, and in addition there are certain disadvantages brought about through the peculiar nature of the bureau's work. For supplying the needs of a scientific laboratory power supply must above all things be continuous. This is never the case when power is bought from a commercial concern and transmitted over a long distance. Often valuable results are lost through failure of the power, and the fact that this has to be taken into consideration in designing a large part of our laboratory apparatus greatly complicates the work.

CARE OF BUILDINGS

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 equpiment 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 THE BUREAU'S BUILDINGS

It is hoped that the transfer back to the bureau's jurisdiction of the maintenance, custodial, and operative services of the bureau's plant may be consummated this year. The Superintendent of the State, War, and Navy Department Buildings, after a survey of conditions at the bureau made at the suggestion of the Director of the Bureau of the Budget, agrees that this should be done. As pointed out last year, the operation of the bureau's plant is so complex and so intimately interwoven with the laboratory services that a division of control and operation is a practical impossibility.

NEEDED SUPPORT FOR TEST WORK

An increase of more than 125 times its initial volume has taken place in the testing work of the bureau during the 23 years of its existence. During the first fiscal year—that is, up to June 30, 1902—there were completed 1,055 tests of all kinds, while during the year just closed 135,852 tests were conducted.

Most of these tests were executed for other branches of the Government, practically every branch making use of the facilities provided, but a great deal of testing is also done for commercial firms and for individuals, over 40,000 test folders, covering over 600,000 such tests, for which a charge is made, having been issued since the founding of the bureau. The Government work is given precedence, however, and in some cases all testing except that for the Government has had to be refused because the demand exceeds the facilities for doing the work.

The inability to meet this demand is unfortunate. It is very desirable for the bureau to carry out certain tests for outside parties, not only as a means of assisting American industries and citizens but because the information so gained is of value to the bureau. The bureau has no intention of entering into competition with commercial testing laboratories, but there are certain classes of work which it is considered desirable for it to undertake because the results would be of public benefit. At the present time over 85 per cent of the scientific instruments used in the United States are manufactured in this country. There has been a tremendous extension of the use of instruments in all fields of industry. In the meantime the bureau's facilities for testing these types of apparatus have not been materially increased and the American manufacturers have been greatly handicapped by their inability to get adequate service from the bureau in developing and testing their instruments. In certain lines American manufacturers have been compelled to adopt unsatisfactory substitutes for adequate tests, and in some cases they have even had to send instruments abroad and to Canada for test.

The Bureau of Standards itself was established as the result of an insistent demand that our manufacturers be made independent of other countries for precise measurements, and it is highly desirable that the testing service of the bureau keep pace with the scientific and industrial development of the country. This testing service is not a severe drain on the Treasury, as fees are charged which practically cover the cost of such tests. The fees, however, are required by law to be turned in to the Treasury, while an appropriation must be secured to pay for the work.

I therefore recommend that more adequate funds be made available for this important service.

Very truly yours,

GEORGE K. BURGESS,
Director, Bureau of Standards.

BUREAU OF FISHERIES

DEPARTMENT OF COMMERCE,
BUREAU OF FISHERIES,
Washington, July 1, 1924.

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 demands upon this service have increased with great rapidity. This is to be expected in view of the great extent of our fisheries; the multiplicity of the problems arising in the fields of fisheries conservation, biology, technology, and propagation; the awakening of the public conscience to the importance of keeping our water areas stocked with aquatic life; of freeing the waters from pollutants; of rehabilitating the runs of salmon, shad, and sturgeon; and providing for an adequate supply of such shellfish as oysters, crabs, and lobsters. The bureau has recognized the need for economies in Government expenditures and has also endeavored to meet the increased demands upon its service through improvements in operations and the centering of its activities on major projects.

The appreciation of the Congress of the importance of the fishery problems is reflected in the conservation measures enacted into laws during the first session of the Sixty-eighth Congress, and the consideration given to other measures touching upon this field. There were four major enactments affecting the fisheries, all of which received the support of the department, as follows:

1. The act for the protection of the fisheries of Alaska, approved by the President on June 6, 1924.

2. Ratification of the North Pacific halibut treaty by the United States Senate on May 31, 1924, and the passage of the enabling act, approved by the President on June 7, 1924, to put into effect the terms of the treaty.

3. The act to protect navigation from obstruction and injury by preventing the discharge of oil into coastal navigable waters of the United States, approved June 7, 1924.

4. The act to establish the upper Mississippi River wild life and fish refuge, approved June 7, 1924.

ALASKA FISHERIES

In 1923 Alaska fishery problems received special study and inquiry by President Harding, Cabinet members, and Members of Congress. Every effort was made to secure a proper understanding of the condition of the fisheries of the Territory, whose overexploita-

tion, primarily through lack of adequate laws, had been repeatedly called to the attention of Congress. It was largely as a result of first-hand information thus acquired that the real seriousness of the situation was realized and ultimately resulted in the passage by Congress, and the approval by the President on June 6, 1924, of a new Alaska fisheries act giving broad powers to the Secretary of Commerce.

The new law gives authority to the Secretary of Commerce to create areas in which fishing may be limited or entirely prohibited in any of the waters of Alaska. Under this authority the Secretary may fix the size and character of nets, boats, traps, or other gear or appliances to be used; limit the catch of fish; and make such regulations as to time, means, methods, and extent of fishing as he may deem advisable. Under the former act of June 26, 1906, authority existed to limit or prohibit fishing only within streams and within 500 yards outside their mouths. The authority to extend such limitations as may be necessary to any waters of Alaska is of vital importance in perpetuating the salmon fishery of that Territory, which in various places has suffered seriously through overfishing. It is provided that every regulation made shall be of general application within the particular area to which it applies. Specific authority for the arrest of persons and the seizure of property is also contained in the new act.

Under date of June 21, 1924, new regulations were promulgated creating eight fishing areas in Alaska in which fishing is limited or prohibited. Features of these regulations include the extension of the weekly 36-hour close season to periods from 48 to 84 hours in certain sections, limitations upon size of mesh, and in southeastern Alaska the creation of 20-day close periods and the entire prohibition of fishing in 12 specific places. Following the approval of the new law the Executive orders previously issued creating the Alaska Peninsula and the Southwestern Alaska Fisheries Reservations were revoked, and all permits issued by virtue thereof were canceled.

The number of persons employed in the fishery industries of Alaska in 1923 was 25,246, the active investment was $60,039,677, and the total value of products was $38,678,825. The output of canned salmon was 241,713,456 pounds, or 5,035,697 cases on the basis of 48 one-pound cans each, valued at $32,873,007, an increase of approximately 10 per cent in both quantity and value, as compared with the preceding year.

The salmon runs at Karluk, Chignik, and Alitak Bay were studied and counts made of the number of fish ascending to the spawning beds. These counts will hereafter form a basis for the limitation of commercial fishing in these waters, as the new fisheries act of June 6, 1924, provides that where the number in a run may be counted or estimated with substantial accuracy there shall be allowed an escapement of not less than 50 per cent of the total.

An investigation of the clam resources in central Alaska was made in 1923, attention being directed chiefly to Cook Inlet and the region around Cordova. The work will be continued in 1924 and extended to other sections.

The treaty of March 2, 1923, between the United States and Great Britain, and the act of June 7, 1924, to carry out its provisions for

the protection of the halibut of the North Pacific Ocean are of particular interest to Alaska, whose coastal waters are fished extensively for this species.

ALASKA FUR-SEAL SERVICE

Computations of the number of animals in the fur-seal herd of the Pribilof Islands as of August 10, 1923, indicated that there were 653,008 seals in the herd, an increase of 48,046 animals over 1922. The total take of sealskins in the calendar year 1923 was 15,920.

In the season of 1923 about 10,000 three-year-old male seals were marked and reserved for future breeding purposes. The reserve was in excess of the 5,000 required by law for the reason that the size of the herd now necessitates the setting aside of a larger number of young males to insure enough breeding animals in the future.

Two sales of sealskins taken at the Pribilof Islands were held at public auction in the fiscal year 1924, at which a total of 22,540 dressed, dyed, and machined skins and 11 not dressed and dyed were disposed of for a total bid price of $581,429. At the sale on October 8, 1923, 2,736 dressed, dyed, and machined skins were sold for $66,911. At the sale March 24, 1924, 19,804 dressed, dyed, and machined skins and 11 not dressed and dyed brought $514,518.

On account of the lack of demand for fur-seal skins and the low prices obtained in 1923, a thorough survey of market conditions was made by an advisory committee of merchants appointed by the Secretary of Commerce. In line with their recommendations, the sale of March 24, 1924, was held in New York City. Previous sales by the Government had been in St. Louis.

The 888 blue and 29 white fox skins taken in the winter of 1922–23 were disposed of at public auction October 8, 1923. The gross proceeds of the sale were $92,716. In the season of 1923–24, 787 blue and 15 white pelts were secured. Systematic work in charge of a specialist has been undertaken for the development of the fox herd and arrangements made for extensive feeding of animals during the winter seasons on both St. Paul and St. George Islands.

COMMERCIAL FISHERIES AND FISHERY INDUSTRIES

Fishery industries during the calendar year 1923 have, on the whole, continued in their recovery from the severe post-war depression. Landings of fresh fish at Boston were the greatest in years, amounting to 123,962,000 pounds, valued at $5,419,000. The prices received were better than in either of the two previous years, although when compared with wholesale prices of other commodities they have hardly reached the pre-war level. During the early part of 1924 prices have suffered a fairly serious decline, although the amount of landings is still in excess of the average. Halibut landings on the Pacific coast have continued to decline in the calendar year 1923, amounting to 7,805,000 pounds as against the average for the last seven years of 12,104,000 pounds. A slight decline is also perceptible in the New England halibut landings. The prices of halibut have increased remarkably.

The total production of canned fishery products and by-products in the United States, including Alaska, in 1923, was valued at $85,148,066, as compared with $71,855,640 in 1922. This would indicate a gratifying growth, but when viewed in detail the condition of the canning industry presents a rather checkered picture. The salmon pack on the Pacific coast was gratifyingly increased over previous years. The prices have suffered some. The same is true of the sardine pack on the Pacific coast, which, in terms of price, has suffered even more severely, and this industry may be said to be in a rather critical position. The east coast sardine pack is slightly below that of 1922 and appreciably below the pre-war level, with a gratifying increase in price. The tuna pack in California has shown a remarkable increase both in quantity and in price. The increase in production was accomplished by the utilization in large quantities of less desirable species, and the extension of the fishery on a large scale into Mexican waters. The proportion of the highly desirable white-meated tuna has steadily declined through the last three years or more, due to the failing supply. The production of canned shellfish and fishery by-products has increased both in amount and value.

Thus, the fishery industries present, on the whole, a very satisfactory condition. There are, however, certain features in various of the industries based on fisheries that are not so satisfactory. The Bureau of Fisheries in fostering the fishing industries has directed its efforts toward improving these features as well as toward the collection of such statistics as are of importance to the fish trade and to the conservationists in indicating the trend of our fisheries.

The California sardine industry is not in a flourishing condition as is attested by the decline in price of its product during the last three years. However, a change in the method of preparing the fish should make it possible to develop a domestic market and help in extending foreign outlets, thus bringing about a favorable reaction upon the price of this product. Attention has been directed to this feature for the last several years, and the technological work, aimed at the development of a new process, is reaching a satisfactory culmination. A new method consisting of a continuous hot-air baking process of preparing fish for the can has been developed, thus doing away with the objectionable fry-bath oil. This process has passed through the small-scale and semicommercial stages of experimentation. The industry is taking advantage of these results and installations are being planned which promise to bring about a complete change toward improvement of the products at no greater cost of production. Incidental to these investigations many principles of fundamental nature in the preparation of fish for canning have been evolved, which should prove to be of vital importance to the science of fish canning.

Technological work on the preservation of nets has been carried on for the past few years; the results have been published and made known to commercial fishermen, resulting in the adoption of copper oleate as a net preservative. Its use has already passed beyond our own borders into other countries.

Further problems in the canning and salting of fish, utilization of by-products, and marketing are urgently demanding attention. It is planned to attack these problems as soon as possible with the limited personnel and funds available.

In the past, difficulty has been experienced in marketing the catch of abundant well-known food fishes, thus hampering the growth of the industry. American housewives as a rule lack specific knowledge of the delectable qualities of many of our abundant fishes, and are not skilled in the many attractive ways of preparing fish; nor are they acquainted with many of the nutritive properties of fish as food. The bureau has cooperated in many ways in an attempt to remove these obstacles to a more general consumption of fish. Special attention has been given through lectures, demonstrations, and the dissemination of informative matter to the better acquainting of our housewives with this valuable food. Especially successful work has been conducted in Boston, New York, and Chicago.

Marine foods have certain health properties of importance and interest to the dietitian and the general public when accurately determined and adequately understood. For example, investigations conducted in the fishery products laboratory of the bureau have proven that sea foods are unusually rich in iodine, some shellfish having 200 times as much iodine and most marine fish 50 times as much iodine as ordinary foods. Marine animals and the oils of fish have certain constituents, such as vitamins, which are of unusual advantage in promoting good health. For example, cod-liver oil contains an abundance of the antirachitic vitamin and oysters of the antiscurvy vitamin. The bureau is cooperating with investigators in examining these questions more closely.

The United States is both a large importer and exporter of fishery products. Information on the condition of the fisheries and markets in foreign countries competing with domestic products is of special interest to our own producers. As the bureau has lists of firms engaged in the various manufacturing phases, it is able to establish direct contact with the different groups in supplying specific and valuable information. During the past year, the salt-fish trade, sardine and salmon canners, and others were supplied with such information, about 3,000 individual market letters being mailed during the year. Many expressions of appreciation for this service have been received.

The statistical program has been carried on as in previous years. The landings of fish by vessels at the ports of Boston and Gloucester, Mass., Portland, Me., and Seattle, Wash., were collected and published monthly. The arrangements with the Bureau of Agricultural Economics of the Department of Agriculture, for the monthly publication of cold-storage holdings of fish collected by them was continued. Statistics on the production, holdings, and consumption of animal and vegetable oils in fish factories were collected quarterly and furnished to the Bureau of the Census under the cooperative arrangement begun in previous years. The statistics on the production of canned fishery products and by-products for the calendar year 1923 were collected and published early in 1924. The annual canvasses of the shad and alewife fisheries of the Potomac and Hudson Rivers were accomplished and are ready for publication. The statistical canvasses of the Mississippi River, Great Lakes, and Pacific coast areas for the calendar year 1923, which were begun during the previous fiscal year, have been completed and preliminary bulletins on the first two named were published. The compilation of statistics on these canvasses was very much delayed due to lack of sufficient

clerical force. It is hoped to have them completed before the end of this calendar year.

PROPAGATION AND DISTRIBUTION OF FISHES

With the recovery from the postwar depression, there has been a substantial growth in our commercial fisheries. Many of our important food fishes are now being fished for so intensively that there is grave concern regarding the future of these fisheries. The number of our people who are enjoying our outdoor recreational advantages is rapidly increasing. The automobile in particular has given a tremendous impetus to this movement in making accessible the heretofore remote places. Reclamation projects, pollution of streams, establishment of dams and of recreational centers have rendered the maintenance of an adequate stock of aquatic life increasingly difficult. These conditions have placed a greater strain on our fishery resources, have enhanced the importance of materially increasing the aid given through artificial propagation by Federal and State authorities, and have resulted in a large increase in demands upon these agencies for eggs, fry, fingerlings, and adult fish.

The fish-cultural operations of the bureau have been directed principally to the development of present resources in an endeavor to increase the production of important food fishes. Many new methods have been inaugurated in the propagation of fish in the hatcheries and in the collection of eggs of commercial species, in an effort to increase the efficiency of the work without greatly increasing its cost.

A large percentage of the output of the interior hatcheries of the bureau has been used to stock waters in the national parks, forests, and other parts of the public domain that are under the jurisdiction of the Federal Government. In the commercial fisheries the bulk of the egg supply is obtained from fish taken for market purposes.

One of the most important branches of the bureau's fish-cultural work is the salvage of stranded food fishes from overflowed lands along the Mississippi River. Flood conditions are the governing factor in determining the extent to which rescue operations may be conducted. The spawning season of the Mississippi River fishes occurs in June, and if the river reaches flood stage during that month the fish seek sheltered nesting places in the more protected parts of the flooded lands. True to their natural instinct, most of the adult fish return to the main channel of the river with the receding waters, but their eggs are left to hatch in the shallow pools. The bureau's rescue crews follow the receding waters, removing the young fish from these landlocked sloughs and depositing them in the main river.

Another important work of the bureau, which serves the growing pearl-button industry, is the inoculation of fishes salvaged in the rescue operations with the glochidia of fresh-water mussels. The fishes so inoculated serve as hosts and distributors of the young mussels. This work was undertaken in an effort to maintain the supply and afford support to a valuable industry, yielding products valued at about $7,000,000 per annum. The demand for the adult shells has become so great as to threaten the extinction of the mussels in many ports of the Mississippi River drainage. The bureau's operations have assumed larger proportions with each succeeding

year. During the fiscal year 1924 the estimated number of glochidia attached to the gills of salvaged fishes prior to their liberation in the river was 1,335,000,000.

The propagation of black bass and other warm-water pondfishes received special attention. By means of leases from the owners of private ponds and water rights, at points remote from permanent fish-cultural stations, the bureau was enabled to produce these species in certain sections of the country at less expense than if the fish had been shipped in from outside sources. In this manner the available output of such fishes was materially increased.

The bureau has continued to cooperate with the fisheries departments of other countries. During 1924 it donated consignments of trout and salmon eggs, totaling 850,000, to several of the foreign governments for replenishing depleted brood stock, and in one instance it furnished eggs of the blackspotted trout in exchange for spawn of the Atlantic salmon, which was not available in this country.

The bureau has cooperated with the fisheries authorities of the various States along lines which have been mutually helpful, and such cooperation has been made more effective by meeting the particular requirements of the parties concerned. Exchanges of both fish and eggs have been made and the bureau has on several occasions loaned the services of experienced members of its personnel to assist State governments in the selection of suitable sites for stations or to aid in the establishment and construction of hatcheries. Many of the States have recently established fish hatcheries in which eggs have been incubated and fish propagated to meet the bureau's requirements, thus supplementing its work. In some instances, States have furnished experienced help to cooperate with the bureau's employees in the collection of eggs. Wherever practicable, the cooperative work between the bureau and the States is being placed on a permanent basis and its scope broadened.

The output of the bureau during the fiscal year 1924 was in excess of 5,360,000,000 fish and eggs, surpassing the production of the preceding year by a substantial margin. The following table shows the increase in several noteworthy instances:

Species	1923	1924
Buffalofish	178,524,338	305,434,823
Cisco	49,000,000	138,360,000
Loch Leven trout	43,800	4,273,800
Pike perch	100,640,000	168,301,000
Winter flounder	1,288,126,000	2,244,290,000

CONSERVATION OF FISHERY RESOURCES

There is an awakening of the public conscience to a realization that our aquatic resources are not inexhaustible; that some of the most highly prized species, such as the salmons, shad, sturgeon, oysters, and lobsters are even now seriously depleted; that adequate conservation laws must be adopted and enforced; and that wherever practicable our water areas should be restored to such a state of

purity as will best serve public health and welfare and maintain an abundant aquatic life. With this awakening to the needs for conservation and restoration, there is a growing appreciation of the importance of biological investigations and a greatly increased demand on the bureau and its scientific personnel to make such investigations. As the appropriations for this work have been reduced, the bureau has been greatly embarrassed during the past year by having to refuse to take up important investigations eagerly urged by State authorities and by private persons interested in the development of aquatic resources. The greater appreciation of the value of such work and the insistent demands that many more important phases be taken up promptly are most gratifying.

The proper conservation of our fishery resources must depend upon a thorough and accurate knowledge of all phases of the biology of the aquatic animals upon which the fisheries depend. The causes of fluctuations in the abundance of the various food fishes must be determined and, if depletion is shown, corrective measures must be applied which take into consideration and are based upon such biological information. It is the service of the division of scientific inquiry to supply these data necessary for the maintenance of our fisheries.

It has been necessary for the division to outline its program of research with the greatest care in order that the returns from its efforts might be of the greatest possible practical value. To this end the work during the past year has been largely directed toward studies of the life histories of some of the more important food fishes—salmons, cod, haddock, whitefishes, and smelt—and of such shellfish as oysters, crabs, clams, etc., which form a basis for important aquatic products. It is primarily essential to have information relative to such fundamental facts as the rate of growth, age at maturity, time and manner of spawning, habits of the young, feeding habits of both young and adults, extent and direction of migrations, extent to which various groups of fishes mingle, particularly with respect to their interbreeding, and the enemies or other factors in their environment which tend to reduce the abundance of those fish from which we obtain our fishery products. Such investigations as these are of primary importance in providing the necessary data for the scientific utilization and protection of our fishery resources. Attention has also been given to the equally important, though not always so immediately applicable, study of oceanography and general aquatic biology. Considerable effort has also been expended in investigations designed to improve the present methods in fish culture.

The great salmon fisheries of the Pacific, with an average annual domestic production of 475,000,000 pounds, constitute our most valuable aquatic resource. A major portion of the product comes from Alaskan waters, where the control of the fisheries is vested in the Department of Commerce. These fisheries have been utilized extensively for many years, and in many places show such serious depletion that commercial extinction seems certain unless adequate protection is given through scientifically sound measures of conservation. During the past year tagging operations were conducted in the region of the Alaska Peninsula similar to those carried on in 1922. A total

of 10,000 salmon were tagged. The results corroborated in every important particular those obtained the previous year and many new data were secured. A number of the more important spawning areas in the regions of Bristol Bay, the Alaska Peninsula, and southeastern Alaska were visited, and valuable information was obtained bearing on the life histories of the salmon and on the relative numbers of spawning fish in the various streams. Weirs were maintained in the Karluk, Letnik (Afognak), and Chignik Rivers and an accurate count made of the fish ascending to the spawning grounds. These censuses are taken for the purpose of determining the number of parent fish which are needed on the spawning grounds in order to maintain the run of fish at its maximum.

Other life-history studies of the Pacific salmon have been continued. Scale examinations of thousands of Alaska salmon have been made, and the results are being correlated with the results of the tagging operations. A report dealing with the growth and degree of maturity of the chinook salmon taken along the Pacific coast reveals that this taking of salmon in the ocean is extremely wasteful, since a large proportion are small and immature and produce an inferior product. The marking of young salmon as liberated from the hatcheries located on the Columbia River has been continued and four new experiments begun.

In anticipation of the further expansion of the clam and crab industries in Alaska, an investigation of these resources was begun during the past year, and a survey of several of the important areas was made. Important information on the life histories of these forms was obtained, and a report is being prepared on the clams and clam resources of Alaska. This information has been put to practical use in preparing fishery regulations.

The study of the whitefishes of the Great Lakes and related species, representing an annual catch in excess of 40,000,000 pounds, has been continued, and certain phases of the work have been completed. These Great Lakes investigations represent one of the more important activities of the division of scientific inquiry.

Our North Atlantic bank fisheries are unsurpassed in importance. The perpetuation of these fisheries is a subject of grave concern to our people. In view of reports of depletion of the fisheries of such important fishing areas as the North Sea, it is urgent that full knowledge of the conditions on the banks adjacent to our own continent be available.

Additional emphasis has been placed on the study of the life histories of the cod, pollock, and haddock, of the great fishing banks off the New England coast. Extensive tagging operations were conducted, beginning in April, 1923, for the purpose of determining the extent and direction of migrations of these fish. A total of 10,000 tags were attached, mostly on cod, and 218 tags had been recovered by the end of the fiscal year. Although the number of returns is comparatively small, significant results were obtained indicating that the cod found on Nantucket Shoals during the summer remain there until the fall, then migrate southward and westward to points between Rhode Island and New Jersey, returning to Nantucket Shoals in the spring. In addition to these tagging operations, a study of the age and rate of growth as shown by the scales has been under-

taken and satisfactory progress is being made. This work is being closely coordinated with similar work conducted by the Canadian Government.

The investigation of the plankton of the North Atlantic south of the Gulf of Maine has been continued and a comprehensive report dealing with the seasonal distribution of the plankton in the region of Woods Hole, Mass., has been completed. In this work particular attention is given to larval fishes, their distribution, habits, migrations, and food. The effect of various physical factors is also being studied.

A hydrographic and biological survey has been conducted in Long Island Sound and a report is nearing completion. The primary object of the survey has been to secure information bearing on the problems of oyster culture and the valuable oyster industry of this region. It has been shown that the serious depletion of the oyster resources in Long Island Sound are due to pollution and to overfishing of the natural oyster beds close to shore. Special attention has been given to the causes of the heavy mortality of young oysters which occurs periodically in Great South Bay, Long Island, and to methods for the artificial propagation of oysters. Reports on the results obtained from the experiments on artificial propagation and on the general situation as regards oyster culture in Long Island Sound and Great South Bay have been published.

The bureau's studies in fish pathology are designed primarily to aid in the important work of artificial propagation and are confined to the diseases affecting both young and brood fish at the various fish-cultural stations. Important advances have been made. The life history of an important intestinal parasite which causes heavy mortality among trout has been worked out and the prospect is encouraging that improved methods of caring for fish may render the loss from this disease insignificant. Studies on the nutrition of fish have yielded valuable results and practical use of the information has been made. These bear especially upon the vitamin content of the fish foods in common use at fish-cultural stations and of the results of a deficiency in the vitamin content.

The experiments and investigations relating to mosquito control by means of fishes were continued for the purpose of determining the effects of seasonal variations with respect to temperature and rainfall. Experiments were commenced to cast further light upon the true value of top minnows (Gambusia) as agents for the control of mosquito production under a variety of conditions. As in previous years, this work has been conducted in cooperation with the United States Public Health Service and the Board of Health of Augusta, Ga.

Other important investigations which have been brought nearly to completion are those dealing with the salmon and smelt of the New England States, a comprehensive study of the fisheries and hydrography of the Gulf of Maine, the hydrographic and biological survey of Chesapeake Bay, and an investigation into the nature and extent of the fouling of ships' bottoms. This last-mentioned study is being conducted in cooperation with the Bureau of Con-

struction and Repair of the Navy Department. At the request of the Government of El Salvador, Central America, a survey of their fishery resources was made by one of the scientific assistants and a report submitted. In cooperation with the Fisheries Conservation Board of North Carolina, work has been begun on an investigation of the mullet and shrimp fisheries of the South Atlantic and Gulf States.

Very truly yours,

HENRY O'MALLEY,
Commissioner of Fisheries.

LIGHTHOUSE SERVICE

DEPARTMENT OF COMMERCE,
BUREAU OF LIGHTHOUSES,
Washington, July 1, 1924.

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

Four additional radio fog-signal stations were established during the year on lightships at Boston, Mass., Nantucket Shoals, Mass., Swiftsure Bank, Wash., and Columbia River, Oreg., a total of 11 such stations being in operation at the close of the fiscal year, with 3 additional light vessels equipped for relief. A new lightship now ready for service on Five Fathom Bank, N. J., was also equipped for use as a radio fog-signal station, and the further extension of this system is planned. Investigations have been carried on for the improvement of radio aids to navigation. Tests have been made of tube transmitters for radio fog-signal stations, developed to take the place of the spark transmitters in use, and other plans developed for increasing the efficiency of the radio fog signal as an aid to navigation. The tube transmitter was placed in service April 23 on Ambrose Channel Lightship and is in successful operation. Increased interest in radio fog signals has been shown by mariners and shipowners during the year, and the system is now in practical use by a large number of vessels. Favorable reports and comments by mariners have been received as to the value to navigation of these signals.

At the end of the fiscal year the Lighthouse Service was maintaining a total of 17,288 aids to navigation, a net increase of 395 during the year. Of the total aids, 6,115 are lighted and 8,678 are floating. There are 674 aids in Alaska, an increase of 24 during the year.

Progress was continued in extending the automatic system of operating lighted aids. During the year 75 attended lights were changed to automatic and 72 new automatic lights were established. At the end of the fiscal year 43 per cent of all coast and lake lights were automatically operated, at greatly reduced cost of maintenance and without loss of efficiency, as compared with lights attended by keepers.

Some portions of the personnel of the service have long been in urgent need of readjustment of salary schedules, as has been set forth fully in previous annual reports. An important step toward such relief is the enactment of the classification act of March 4, 1923, which was made effective in the District of Columbia July 1, 1924, and for the field service to a restricted extent. The results of this act and the principles and methods it establishes for the adjustment of the difficult problem of fair compensation are of great value in improving the civil service.

The following are the more notable lighthouse construction works during the year: Construction was commenced of the important new light and fog-signal station at Cape Spencer, Alaska. The stations at Guard Island and Point Retreat, Alaska, were rebuilt and much needed powerful fog signals were installed. The construction of a light and fog signal on Sabine Pass Jetty was completed and the station put in commission. Further progress was made on the project for improving aids to navigation on Raritan Bay, N. J. Work was also in progress on projects for improving aids to navigation on the Hudson River, N. Y., and reinforcing the foundations of various light stations on Middle Atlantic coast waters which have been weakened or endangered by action of the sea. Various other important items of lighthouse and depot construction or improvement were completed or in progress during the year, as detailed elsewhere in this report.

Five new lightships, having modern equipment, were completed and placed in commission on important stations on the Atlantic coast. The new vessels were much needed to replace old vessels which were worn out and unsafe for service. A new tender for service on the Ohio River and tributaries was also completed and will be placed in commission at an early date.

One of the new lightships, equipped with radio fog signal, as well as a powerful steam whistle and a submarine oscillator, was placed on Nantucket Shoals, Mass. The new vessel was specially designed and equipped for this station, which is probably the most important lightship station in the world.

The commissioner, at the invitation of the Canadian authorities, made a brief visit to Canada toward the end of the fiscal year and was taken on an inspection trip on a lighthouse tender on the St. Lawrence River between Montreal and Quebec, and also visited the headquarters of the department of marine and fisheries at Ottawa. Canada has an extensive and up-to-date lighthouse service, conducted under the department of marine and fisheries, in which are gathered the activities of the Canadian Government having to do with marine affairs other than naval. The St. Lawrence is well marked by range lights and other aids, and various matters of interest in connection with this system were noted. Great interest is taken in Canada in the matter of radio aids to navigation and considerable progress has been made.

AIDS TO NAVIGATION

During the fiscal year ended June 30, 1924, there was a net increase of 395 in the total number of aids to navigation maintained by the Lighthouse Service. There was a net increase of 122 lights, 43 gas buoys, 7 float lights, 19 fog signals, and 204 other unlighted

aids. On June 30, 1924, there were maintained by the service 17,288 aids to navigation, including 6,115 lights of all classes and 606 fog signals—not including 161 buoys with whistles and 420 buoys with bells—of which 11 are radio signals, 7 are bells operated automatically by gas, and 48 are submarine signals.

During the year 34 new aids were established in Alaska, including 20 new lights, 1 gas buoy, 1 gas and bell buoy, 1 fog signal, 6 unlighted buoys, and 5 beacons. The total number of aids to navigation in Alaska on June 30, 1924, was 674, being a net increase of 24 over the preceding year.

Improvements in aids to navigation in the service generally have been made during the year as follows: 46 fixed lights were changed to flashing or occulting, the illuminant of 3 lights was changed to incandescent oil vapor, the illuminant of 68 lights (including 1 light vessel and 28 lighted buoys) was changed to acetylene, the illuminant of 41 lights (including 5 light vessels) was changed to electric incandescent; 506 aids to navigation of various classes were discontinued during the year. The discontinuance of further aids is under investigation from time to time as the original necessity for their maintenance ceases, and in that event they are promptly put out of commission, in the case of lights, with the approval of the Secretary of Commerce.

Fog signals were established at 10 important stations, and the fog signals at 10 other important stations were improved by the installation of more efficient apparatus. Four radio fog-signal stations were established.

General repairs required for upkeep of aids to navigation in efficient working condition were continued during the year so far as available funds permitted, 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. Various special works were actively carried on during the year, including the establishment of important light and fog-signal stations, the construction of new light vessels and tenders, improvements in systems of fixed aids and buoyage, etc.

ENGINEERING CONSTRUCTION

The more important items of construction completed during the fiscal year were the transfer of an unused keeper's dwelling from Ned Point Light Station to Wings Neck Light Station, Mass., including the installation of a heating system and other necessary improvements; a wharf and three boathouses at Lewes, Del., for the joint use of the third, fourth, and fifth lighthouse districts; riprap protection for four light stations in the fifth district; a light and fog-signal station at Sabine Pass Jetty, La.; riprap protection placed about Sand Island Light Station, Ala.; a reinforced concrete bulkhead wharf at San Juan lighthouse depot, P. R.; the construction of a roadway at Point Borinquen light station, P. R.; improvements at Detroit lighthouse depot, Mich., including a reinforced concrete wharf, the construction of an addition to the lamp shop, a building for storage of cement and other materials, and other improvements; placing a protective belt around the pier at Spectacle Reef Light Station, Mich.; improvements at Chicago Harbor, Ill.;

improving aids at Indiana Harbor, Ind.; rebuilding the Guard Island and Point Retreat Light and Fog-signal Stations, Alaska.

Other important works in active progress at the close of the fiscal year included the following: Improving aids to navigation in the Hudson River, N. Y.; placing riprap protection about certain light stations in the third lighthouse district; establishing and improving aids to navigation in Raritan Bay and connected waters, New York and New Jersey; improving aids to navigation, Delaware Bay entrance; repairing and rebuilding aids to navigation, Atlantic coast, damaged by storm and ice; aids to navigation on the eastern shore of Chesapeake Bay and tributaries; establishing and improving aid in St. Johns River, Fla.; repairing and rebuilding aids to navigation in seventh lighthouse district; 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.; improving aids to navigation at Conneaut Harbor, Ohio, and Erie Harbor, Pa.; preparation for completing work in Detroit River; placing a protective belt around Stannard Rock Light Station Pier, Mich.; improving aids at Calumet Harbor, Ill.; constructing keeper's dwelling at Manitowoc, Wis.; establishing and improving aids at Ludington, Mich.; constructing a light and fog signal at Cape Spencer, Alaska; improvements at Coquille River Light Station, Oreg.; improvements at Grays Harbor Light Station, Wash.; and the construction of a light and fog signal at Point Vincente, Calif.

IMPROVEMENTS IN APPARATUS AND EQUIPMENT

Important progress has been made in the installation and use of radio fog signals for protection of navigation in fog. Investigation was continued with a view to lessening or eliminating the effect of interference. To this end a tube transmitter operating an alternating continuous wave was developed and tested and later installed on a lightship. This transmitter has proved satisfactory and is being used on other installations now under way.

Radiotelephone equipment was installed on the tender *Cedar*, for use in communicating with stations equipped with radiotelephones. Radiotelephones have also been established at two stations in the eleventh district and preparations made for similar installations at two other stations in that district where other means of communication are not available. Radiotelephone apparatus has also been installed at an isolated station in the eighteenth district for communication with a station on shore.

The extension and improvement of automatic lighting apparatus was continued. This system has been applied economically and with increased efficiency to minor lights heretofore operated by personal attendants.

Primary electric batteries and small incandescent lamps for minor lighted aids have been installed at several stations, with indications of satisfactory service when the apparatus is finally perfected.

Experiments were made with flexible mantles for incandescent oil vapor lights, with a view to increasing efficiency and to avoid break-

age in transportation and handling at stations and to reduce the bulk of packages in shipping, and favorable results were obtained.

The hygroscopic device developed in the fifth district is now in practical operation at Lambert Point for controlling the fog signal and has been further perfected during the year.

The system of electric incandescent lighting developed for light-vessel illumination was improved and extended, the five new light vessels completed during the year having been equipped with this system of lighting.

Further improvements in the design of gong buoys recently developed was under consideration.

The installation of storage tanks for kerosene at depots and light stations and the purchase of kerosene locally in bulk was continued.

On June 30, 1924, 322 light stations had telephone connections, this being an increase of 7 during the year.

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 well distributed along the coasts of the country, but it is important that various improvements be made from time to time to facilitate the work of a growing branch of the Government. These include closer communication between the district offices and the main depots, at times requiring the relocation of the depots; installation of railway spurs and increasing railroad facilities; keeping the depot shops abreast of the times by installation of modern tools and appliances; improvements in trucking facilities; improvements in the storing of supplies and apparatus; rearrangement of wharves and slips, etc.

The lighthouse depot at Portsmouth, Va., is the principal depot of one of the largest lighthouse districts and is the headquarters for five tenders and two light vessels during the greater part of the year. The facilities for berthing these vessels are entirely inadequate, and the efficient operation of the vessels is much hampered in consequence. The inadequacy of space for storing and handling buoys causes much delay and loss. Increased facilities for this depot are urgently necessary. Improvement of this depot is under consideration.

Provision is also needed for improved depot facilities in several other districts, particularly at or near Newport, R. I.; Key West, Fla.; Honolulu, Hawaii; and New Orleans, La. Additional funds are needed for the completion of the important depots at Boston, Mass.; Charleston, S. C.; and Ketchikan, Alaska.

In addition to the above there will be needed in the future a new depot in the first district to replace that at Little Diamond Island, which is inconveniently located; another depot at Rockland, Me., to break the distance between Little Diamond and Bear Island depots; dredging at the entrance to Woods Hole depot, Mass.; completing the improvements to wharves and providing new storage buildings at the general depot, Staten Island, N. Y.; rebuilding the wharves, etc., at Edgemoor depot, Del.; an office building for the depot at San Juan, P. R.; and improvements to the wharves at Goat Island depot, Calif.

VESSELS OF THE LIGHTHOUSE SERVICE

REPLACEMENT OF VESSELS

Further progress has been made during the year in the replacement of old and worn-out vessels. Five light vessels were completed and placed in commission, and this has resulted in a shifting of other light vessels, permitting of condemnation of five old light vessels which were beyond economical repair. A new river tender was completed, and two mine planters which had been transferred from the War Department were reconditioned for service as tenders.

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, seven light vessels and four tenders should be replaced and two 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 one new light vessel, two new tenders, and the reconditioning of two others.

LIGHTHOUSE TENDERS

The lighthouse tenders during the year have steamed a total of 477,792 nautical miles, or an average of approximately 7,833 miles for each tender, in the work of maintaining buoys, carrying supplies and construction materials to stations, supplying light vessels 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.

One new river tender, the *Greenbrier*, was completed during the year, and will be placed in commission at an early date to replace the worn-out tender *Goldenrod* for service on the Ohio River and tributaries. The reconditioning of two mine planters was also completed. These will be placed in commission at an early date in the first and second districts.

The act of January 5, 1923, appropriated $240,000 for constructing, purchasing, or equipping lighthouse tenders and light vessels and the act of May 28, 1924, appropriated $100,000 for the same purpose. It was necessary to use both of these amounts for the construction of a river tender urgently needed to replace the *Oleander*, worn out in service, and a contract was made for the construction of a new tender for this purpose. At the end of the year 6 tenders were equipped with radiocompasses and 30 tenders with radiotelegraph; 57 tenders in all were in commission.

LIGHT VESSELS

The service maintains light vessels on 47 stations. During the fiscal year 60 vessels were in commission, of which 13 were relief vessels, and they averaged 261 days on station per vessel. Many of these light vessels have passed the age of useful service, and some of

them are in such condition as to be not worth the cost of repairs. Five were condemned during the year. Of the vessels in service 41 have self-propelling machinery and 18 are provided with sail power only. One has no means of propulsion.

The five new light vessels, *Nos. 106* to *110*, constructed under the appropriation of $1,000,000 made by the act of March 4, 1921, were completed and placed in commission during the fiscal year on the stations assigned, except *No. 108* and *No. 110*, the former being used as a relief vessel temporarily and the latter being placed on station after the close of the fiscal year.

New light vessel *No. 111*, the hull of which was constructed by a company to replace a light vessel sunk by a barge, was launched on June 14, 1924, and was towed to the general depot at Staten Island, N. Y., where the Diesel propelling machinery and auxiliaries will be installed and the vessel completed. This light vessel will probably be assigned to Northeast End Lightship Station, N. J.

Radio-communicating apparatus was maintained on 30 light-vessel stations and 11 relief vessels during the fiscal year. Fourteen light vessels are equipped with radio fog-signal apparatus. A submarine oscillator has been installed on light vessel *No. 106*, stationed at Nantucket Shoals, Mass.

SAVING OF LIFE AND PROPERTY

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 125 instances of saving life and property or rendering valuable aid were reported, 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.

ADMINISTRATION

The general organization of the service remained unchanged during the fiscal year.

The appropriations for annual maintenance of the service for the fiscal year 1925 were $69,590 less than the preceding year. Efforts have been continued toward reducing expenditures and estimates, but the cost of materials, though reduced to some extent, has not declined sufficiently to permit a material reduction in funds needed for support of the service, in view of the large amount of upkeep work, which is becoming increasingly urgent because of inadequate funds during the past few years. The reduction of appropriations has necessitated the further deferring of much important and necessary repair work which has been accumulating and which has been deferred for several years because of higher costs and inadequate funds.

The classification act of March 4, 1923, was made effective for the District of Columbia July 1, 1924, and will be of benefit, especially as regards the personnel in Washington which has been greatly underpaid. Some adjustments in allocations are necessary in order to provide equitable treatment for all employees. Classification has in part also been tentatively applied to the field service, and adjust-

ments have been made as regards certain classes of positions. Urgently necessary adjustment for that part of the service whose compensation is limited by statute is being necessarily deferred pending the completion of legislative action.

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.

The eighth conference of superintendents of lighthouses was held in Washington, January 14 to 17, 1924, and was attended by all the superintendents of the coast and lake districts except those of the three outlying districts. Many technical and business problems in the work of the service were considered; the work of the conference was conducted largely through committees designated in advance.

A revised edition was published of a pamphlet describing the radio fog signal and the use of radio in navigation.

Systematic inspections of the service, both on its technical and its business sides, were continued during the year. The examiner made examinations of the office business methods and accounts, depot stores and other property, records, etc., in some of the lighthouse districts, and special inspections were made by the commissioner and other officers from Washington.

Various economies in the maintenance of the service have been effected, the more important being the result of extending the use of automatic apparatus for operating the lights; 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 and other equipment in larger quantities; and the discontinuance of aids to navigation found to be no longer necessary. The development of improved apparatus and equipment used 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, 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, 1924, there were 5,981 persons employed in the Lighthouse Service including 91 technical, 154 clerical, and 5,736 employees connected with light stations, vessels, and depots. This is a net decrease of 39 during the fiscal year. This service is charged with the maintenance of aids to navigation along 40,580 statute miles of general coast line and river channel.

The annual report of the United States Employees' Compensation Commission for the fiscal year ended June 30, 1923, gives the number of reported cases of injury subject to compensation for the calendar year 1922 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, 6; cases resulting in permanent total or partial disability, 3; and of temporary total disability, 101. 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 classification act of March 4, 1923, already partly effective, will be of great value in increasing the efficiency of the personnel of the service.

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 during the fiscal year, whether of money or supplies. The information from 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.

LEGISLATION NEEDED

PROVISIONS FOR RETIREMENT FOR DISABILITY AND OTHER CHANGES IN LIGHTHOUSE SERVICE RETIREMENT LAW

For the persons covered by the Lighthouse Service retirement law (act of June 20, 1918) it is very desirable that provision be made for disability retirement. The arduous and hazardous character of much of the work of the service, especially on vessels and at light stations, renders the lack of a provision for disability retirement especially serious and causes great hardship in many meritorious cases. Congress has recognized the justice, under certain conditions, of providing relief for persons in the Government service who become incapacitated for duty. It has made provision for disability retirement of persons in the Coast Guard and in the Army and Navy. In the general civil service retirement law of May 20, 1920, there is also provision for retirement for disease or injury not due to vicious habits. Persons included in the Lighthouse Service retirement law are the only ones in the military or classified civil service of the Government to whom some such disability provision does not now apply, and legislation is needed to remedy the omission in the Lighthouse Service law. Some other modifications in this retirement law are also desirable in the interest of good administration and efficient service.

EXTENSION OF MEDICAL RELIEF FOR LIGHT KEEPERS

Light keepers are now entitled to medical relief at hospitals and stations of the Public Health Service. These hospitals are, however, inaccessible for a large number of light keepers who are sta-

tioned at remote or isolated points. In order that equal benefits may be extended to all light keepers, legislation is needed to provide medical relief for those serving at isolated stations, and this has been concurred in by the Public Health Service and the Secretary of the Treasury.

OTHER MEASURES FOR RELIEF OF PERSONNEL

Legislation is needed to permit the adjustment, within a moderate amount, of claims by lighthouse employees for loss or damage to personal property, such as clothing, furniture, etc., caused by storms, collisions, or fire at light stations, depots, and on vessels. Legislation is also needed to give corresponding employees of the Lighthouse Service certain necessary privileges now accorded by law to similar services, including the purchase of commissary supplies, transportation of families and of household effects when ordered to permanently change station, and transportation on Army transports.

PROTECTION OF AIDS TO NAVIGATION

Legislation is needed for the better protection of aids to navigation. Such aids, especially those located in the water, are often damaged by passing vessels, and it is difficult in many instances to locate the party at fault. More stringent requirements are necessary as to reporting such injuries, etc. Sums received in payment of damages should also be made available for repair of the aids damaged.

SUBSISTENCE ALLOWANCE

The present allowances authorized by law for subsistence while traveling on official business are quite inadequate in many cases, and persons whose duty requires them to travel are compelled to personally pay a portion of the necessary expenses incurred in the performance of Government business. Furthermore, Congress has in recent years recognized the increased cost of subsistence, having authorized higher rates of travel allowance for various branches of the Government service, introducing unjust inequalities. There is the same need for readjustment and equalization in this matter that there was in the salary schedules.

Very truly yours,

GEORGE R. PUTNAM,
Commissioner of Lighthouses.

COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE,
COAST AND GEODETIC SURVEY,
Washington, July 1, 1924.

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

ATLANTIC AND GULF COASTS

Offshore and revisional inshore hydrographic surveys and topographic resurveys were made at Cape Fear, N. C., along the Florida coast, southward of St. Augustine and off Sabine Pass, Tex. Three vessels and one tender were employed upon these surveys.

Wire-drag surveys were resumed in the vicinity of Portland and extended southward to Biddeford, Me. This work has been in abeyance since 1919 because of lack of funds and was again discontinued after the fall of 1923 for the same reason.

A survey of Lake Okeechobee, Fla., was begun in the winter of 1923–24 and will be resumed next winter. Triangulation control stations have been established along all sides of the lake and have been connected by primary traverse with the coastwise control system.

The wire-drag survey of Porto Rican waters, mentioned in my last annual report, was completed early in the fiscal year, and the survey party with one vessel and three tenders has been surveying the waters of the Virgin Islands. This work will be completed during the next fiscal year.

A resurvey of Baltimore Harbor was nearly completed at the end of the year.

PACIFIC COAST

Original hydrographic and topographic surveys were made along the Alaska Peninsula, at Ikatan, Morzhovoi, Cold, Pavlof, Wide, Portage, and Chignik Bays, and in the offshore areas in the vicinities of these bays and in Kachemak Bay in western Alaska. These surveys were made by the personnel of two surveying vessels.

In southeastern Alaska original hydrographic and topographic surveys were carried northward along the outside coast from the work of last year to a point well north of Cape Ommaney, and the survey of El Capitan Pass was completed.

The wire-drag survey of the main steamship route through southeastern Alaska, on which the survey has been working continuously since the World War, was completed in the fall of 1923 with the survey of Icy Strait and Cross Sound. A special survey, requested by the War Department to safeguard laying the new Alaska military cable, was made of Kasaan Bay and Twelve-Mile-Arm.

At the end of the fiscal year a detailed hydrographic and topographic survey was in progress in Thomas, Gambier, and Pybus Bays. On the Pacific coast offshore hydrography was resumed, first on the southern California coast, where discontinued the previous year, and extended northward throughout the winter, and was then taken up on the Oregon coast in the vicinity of Cape Blanco. One vessel was employed on this work. Three revision survey parties were employed during the late winter and throughout the spring months on Puget Sound and one similar party on the Oregon coast recovering and remarking old triangulation stations and extending control for hydrographic surveys and locating new wharves and structures for chart correction.

In the Hawaiian Islands one officer has been employed throughout the year on special surveys for military purposes. This included a hydrographic survey of Lahaina Roads, in such detail as required for an anchorage chart for naval vessels, and a special confidential survey for the War Department. For the former survey personnel, except the chief of party, and vessels were provided by the Navy Department; for the latter survey the principal assistants were provided by the War Department; and the chief of party and hands by the Coast and Geodetic Survey.

In the Philippine Archipelago hydrographic and topographic surveys were made in the Sulu Sea and in the vicinity of Sarangani Bay.

ADDITIONAL VESSELS

In my last report mention was made of the need for additional vessels. This has become more acute, since no additional vessels were provided, and the old vessels, which these were intended to replace, are becoming less serviceable each year. In general, the survey fleet is modern and efficient, but there are still a few of the old craft—most of them quite small—which have outlived their efficient usefulness and are even in some cases unsafe for further operation. Two small vessels on the Atlantic coast—one of 472 tons displacement and the other of 146 tons—are inefficient, weak, and costly of maintenance. These two could be profitably replaced by one modern vessel of from 500 to 600 tons displacement. Three vessels of about 50 tons displacement are urgently needed for work in Alaska as tenders to the large survey vessels. At present the survey has two such vessels, but both are old and weak, and it is with the greatest difficulty that they are maintained in operation this summer. Neither is safe nor efficient.

NEW APPARATUS IN USE

Mention was made in my last report of new apparatus just completed for determining the position of a survey vessel with reference to the shore when the latter is invisible through darkness, fog, or

rain. The vessel on which this apparatus was installed, the steamship *Guide*, went to Fort Wright, Fishers Island, N. Y., and with the assistance of Army officers stationed there made as thorough test of the apparatus as facilities afforded. The *Guide* then proceeded to the Pacific coast and began offshore surveys on the Southern California coast. Some further experimental work was found to be necessary when the apparatus was applied to actual field conditions, but before the end of last winter it was in complete working condition, and satisfactory results were obtained. Later the vessel moved to the Oregon coast, where normal weather conditions present the greatest difficulties for continuous offshore hydrography.

On the same vessel was installed a sonic depth finder, an apparatus devised and constructed by the United States Navy for determining ocean depths by measuring the time interval of a sound wave traveling from a sound source on the vessel to the ocean bottom and back to the vessel. During the passage of this vessel from Connecticut to California soundings were taken at frequent intervals by the sonic depth finder and by standard deep-sea sounding machine of the wire measurement type. Many additional double determinations of depth by the two types of sounding machines were made after the arrival of the vessel on the California coast and in connection with the hydrographic survey of that coast. From these data there has been developed an equation for the velocity of sound in sea water which takes into account temperature, pressure, and salinity, and tables have been prepared for use in ocean hydrography.

GEODETIC WORK ACCOMPLISHED

The geodetic work accomplished during the past year consisted of the determination of geographic positions by triangulation and traverse, precise elevations by precise leveling, astronomic longitudes and latitudes, and values of gravity. This work was done in many of the States and in Alaska.

In conducting the geodetic work every effort was made to cooperate with other Government agencies and outside agencies and individuals to the mutual advantage of the bureau and those who were assisting in the cooperative work.

The Coast and Geodetic Survey and the Geodetic Survey of Canada have entered upon a cooperative agreement for the extension of an arc of precise triangulation and traverse from Lake Superior westward to Point Roberts, Wash., the end of the international boundary between the United States and Canada, for the purpose of furnishing a tie between the surveys and maps of the United States and those of Canada to the westward of Lake Superior. In the division of the work along the boundary the Coast and Geodetic Survey is operating between the Lake of the Woods and Lake Superior and from the one hundred and ninth meridian of longitude westward to Point Roberts. The remainder is being done by the Geodetic Survey of Canada.

The Coast and Geodetic Survey and the Geodetic Survey of Canada are also cooperating in the extension of an arc of precise triangulation which will extend from Puget Sound into Alaska. In carrying out this work a party of the survey operated during the first part of the fiscal year in southeastern Alaska in determining the

astronomic longitude and azimuth at seven precise triangulation stations for use in the adjustment of the triangulation. A second party operated during the latter part of the fiscal year in measuring precise base lines for the control of the lengths of the triangulation and in making horizontal angle observations to connect the triangulation of southeastern Alaska with that of the Geodetic Survey of Canada to the southward of Dixon Entrance.

The Coast and Geodetic Survey cooperated with the boundary commission appointed by the Supreme Court of the United States to decide on and mark the boundary line between Texas and Oklahoma, along the Red River. The field expenses of this work, aside from salaries of our officials, were paid from funds administered by the commissioners. This cooperative work was of immediate and great benefit to the commissioners, and also furnished a valuable addition to the general horizontal control system of the country which the survey is charged by Congress to execute.

Another important piece of cooperative work was with the officials of Yavapai and Maricopa Counties, Ariz. The east and west boundary between those two counties is defined in terms of latitude. Attempts in the past to lay down the boundary from astronomic observations resulted in differences of opinion as to its true location. After correspondence with the office of the survey the county officials agreed that the boundary should be laid down by geodetic methods, and they requested that bureau to do the work. The field expenses were paid by the counties.

Undoubtedly there will, in the future, be many calls on the survey by State and county officials to survey their boundary lines and determine the geodetic latitudes and longitudes of the monuments. Engineers and others who make use of accurate geographic positions realize the saving that these positions can make in their many operations and are making great demands for a more rapid extension of the triangulation net.

A line of precise levels was completed in New England extending from Portland, Me., through Boston, to a point near the western boundary of Rhode Island. Several spur lines were run from the main line in the vicinity of Boston in order to furnish local engineers with accurate elevations based on mean sea level. Another line of precise levels was run between Poughkeepsie and Dover Plains, N. Y. A short line of precise levels was run from Los Angeles to San Gabriel, Calif., to determine the exact elevation above mean sea level of points along the Pasadena base.

A double leveling party ran several hundred miles of precise leveling in the Yellowstone National Park during the first half of the fiscal year. This was done at the request of park officials, and most of the expenses of the field work were paid by them.

The line of precise levels begun in the calendar year of 1922 at Anchorage, Alaska, at the head of Cook Inlet, which was planned to run through Fairbanks and thence to Valdez, was continued and completed during the fiscal year 1923. A line of precise levels between Seward and Anchorage was also completed. The leveling connects with tide gauges at Anchorage and Valdez.

A precise triangulation party continued in 1923 the observations on the arc started during the fiscal year 1922 which extends from the

head of Cook Inlet toward Fairbanks, Alaska. The work was taken up again last spring and was in progress at the end of the fiscal year. This triangulation is part of a general scheme which eventually will be extended over the Alaskan area, following routes of travel for the coordination of the charts of the survey and for the control of all public surveying and mapping of the interior. The work is most urgently requested by the General Land Office, which is laying out public lands for settlement. That office wishes to avoid in Alaska the great confusion which necessarily resulted in the United States from having to use many prime meridians and base lines in laying out the public lands.

The survey cooperated with the seismological committee of the Carnegie Institution of Washington during the fiscal year 1923, as it had during 1922, by reobserving the angles in the precise triangulation system of California to detect any earth movements which had occurred between the time the first observations were made some 30 or more years ago and the present. The preliminary results of this work indicate clearly that certain mountain peaks and other points on which triangulation stations had been established have moved during the interval between the old and the new observations.

Other work during the fiscal year consisted of the determination of the value of gravity at a number of stations in Texas for the use of the Geological Survey in carrying on certain studies connected with economic geology. Triangulation and traverse were extended along the coast of South Carolina. This work was designed to establish a number of stations to replace those established many years ago which had been destroyed by coastal erosion, and also to strengthen the triangulation around Charleston, which was deranged by the earthquake of 1886. A traverse was run from the vicinity of Miami, Fla., to Lake Okeechobee, in order to furnish geographic positions on which to base charts of that lake. A revision was made of the precise leveling from Weed, Calif., to the vicinity of Seattle, Wash.

The officials of the bureau have commended in the highest terms the help which has been rendered them by the Bureau of Standards, geophysical laboratory of the Carnegie Institution of Washington, United States Naval Observatory, and the department of civil engineering of Columbia University. They also comment in highest terms on the cordial relations which have existed, not only during the year but for many years, between the Geodetic Survey of Canada and the United States Coast and Geodetic Survey. This has resulted in a single system for the triangulation nets of the two countries and also for the precise leveling nets.

The survey has taken an active part in the affairs of the Board of Surveys and Maps of the Federal Government during the fiscal year.

OFFICE NEEDS AND WORK ACCOMPLISHED

After observations have been made in the field, in the triangulation, leveling, astronomic, and gravity work, it is necessary that computations, adjustments, and discussion of the results be made in the office. Although it is true that at least preliminary results can be furnished engineers and others shortly after the field work has been completed, it is not possible to give the results wide distribu-

tion until they have been finally adjusted and put into print. The force of mathematicians and computers in the Washington office should be increased in order that the geodetic data may be given the public in workable form. The product can not be considered as finished until this office work has been done.

Greater demands have been made on the survey during the past fiscal year than ever before for the results of geodetic operations. The computations and adjustments of the several classes of geodetic work covered observations made in the following States, besides Alaska and Hawaii: Arizona, California, Colorado, Connecticut, Florida, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Montana, New York, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Texas, Washington, and Wyoming.

Congress provided an item of $7,500 in the appropriation for the fiscal year 1924 for the computation and adjustment of the triangulation of the Hawaiian Islands, most of which was done by the Royal Government of the islands before annexation to the United States. Excellent progress was made in the computation of this triangulation, and about half of the work was completed during the fiscal year. Congress provided $5,000 for the continuation of the Hawaiian computations for the fiscal year 1925. A small amount of money will be needed in the fiscal year 1926 to complete the work and to print the results.

For several years the estimates for the survey have included an item for the computation and adjustment of the triangulation along the Mississippi River which has been in existence for a number of years. The geographic positions of the stations are on independent datums and therefore are of little value as control points for the Federal, State, and county surveys and maps of the 10 States touching that river. An appeal was made to the Mississippi River Commission to adjust their triangulation into the general net of the country, but the commission held that it was not authorized by law to make such computations, in view of the fact that the existing data are sufficient for all the needs of the commission. As the survey is the bureau charged by Congress to furnish geographic positions, it feels in duty bound to submit an estimate for the computation and adjustment of the Mississippi River triangulation. The bureau has been urged to do this by a number of Government organizations.

GEODETIC SURVEYS NEEDED

The mapping of the country is a project which in the interests of the industrial and commercial expansion of the United States should be carried on with greater rapidity than has been the case in the past. Even a casual consideration will convince anyone that all important economic and industrial activities are dependent upon a knowledge of place and elevation. These can be supplied only by surveys and maps, and these in turn must depend upon fundamental control surveys.

The survey is charged by Congress to execute a portion of the topographic survey. That portion consists of the triangulation for determining the geographic positions of starting points for the detailed survey and the precise leveling which gives the elevation above sea level of bench marks used for the detailed leveling. This

geodetic work has been under way for many years, but the amount of appropriation made annually for it is inadequate to meet the current demands made on that bureau from various sources.

Greater appropriations have been made in the last two years for the topographic work by the Geological Survey without any corresponding increase of appropriation to the Coast and Geodetic Survey for the control work.

The control work should be rapidly carried out in order that topographic maps may be made at any place where commerce and industry demand, with assurance that when all the gaps are filled in between the topographic maps there will not be gaps, overlaps, and offsets between each two contiguous map sheets.

The whole control system of the country will cost only a few millions of dollars, and I urgently recommend that this work be done as a continuing project and carried to completion in advance of the topographic mapping.

The United States is behind the other progressive countries of the world in its control surveys; there are strong economic reasons why our system should be prosecuted with corresponding diligence. The money spent for such surveys should rightly be considered as an investment which will now and hereafter bear large interest to the public.

If we are to have 150,000,000 people in this country in 1950 and probably 200,000,000 not many decades after that date, this is certainly the time to take stock of the natural resources of this country in order that they may be developed, utilized, and conserved along rational lines. The first step is to learn what we have in the form of water power, minerals, including oil and coal, timber, soil fertility, forests, lands to be irrigated or drained, and this can not be done unless there is first made an adequate topographic map such as that now being made by the Geological Survey. I earnestly hope that provision will be made for greater activity by the Coast and Geodetic Survey in the extension of the necessary control system for surveys and maps.

MAGNETIC WORK

Five magnetic observatories—located at Vieques, P. R.; Tucson, Ariz.; Cheltenham, Md.; Sitka, Alaska; and near Honolulu, Hawaii—have been in operation throughout the year, and continuous records have been secured on the magnetographs and seismographs. The records have been used to reduce the field results to standard values, and they also furnish material needed in the study of terrestrial magnetism.

The site of the observatory at Vieques, P. R., which is on private land, must be vacated on the expiration of the lease, which is June 30, 1925. A new site is being sought on public land in Porto Rico.

The field magnetic work has been primarily resurvey work. This has included the inspection and replacement of defective magnetic stations for the use of local surveyors in standardizing their compasses and the occupation of repeat stations to determine the change in the magnetic elements. Most of the replacement work was done in California, Texas, Georgia, Tennessee, and North Carolina. In the case of North Carolina, the State cooperated so that a complete

resurvey of the entire State might be carried on continuously to completion during the next fiscal year. In California, in addition to replacement work, a survey was made along the coast from the Mexican border to San Pedro, and observations were made during the total eclipse of September 10. Repeat stations were occupied between Vermont and Illinois and between Nebraska and California.

A canvass of county surveyors, started in the previous fiscal year, was continued throughout the year, so that the bureau is now in correspondence with more than 2,000 county surveyors, an increase of 1,000 during the year, and has received reports on the state of preservation of 33.3 per cent of its approximately 3,700 magnetic stations, an increase of 12 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.

A badly needed resurvey of the Philippine Islands will be started during the next fiscal year and completed in the following year. This has been made possible through cooperation with the Insular Government.

Magnetic information is now furnished by this bureau in the preparation of aviation maps, in the studies of difficulties in radio and cable transmission, in the study of the atom by scientists, as well as in the never-ceasing demand to solve the mysteries of terrestrial magnetism.

There is most urgent need for increasing the office force of the division of terrestrial magnetism. Improved methods 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 past fiscal year the magnetic declination was determined at a large number of triangulation stations in southeastern and western Alaska. This work makes it possible to place correct magnetic information on the new charts of the regions which are being surveyed.

The area of Alaska is so great that an immense amount of work will have to be done before the magnetic survey can be considered complete. At present magnetic stations are found only along the main lines of travel, and there are vast areas where no observations have been made. Observations are needed along the west coast, including the Aleutian Islands, and in the interior.

It is planned to start work in the Aleutian Islands during the next fiscal year, provided that transportation arrangements can be made. The officer doing this work will also make latitude and longitude and other observations that are badly needed in this region.

The magnetic observatory at Sitka furnishes a continuous record of the magnetic declination, dip, and intensity. Disturbances known as magnetic storms occur with great frequency in Alaska. These storms are frequently accompanied by auroral displays and are apparently related to unusual difficulties in cable transmission and in the operation of radio stations. The records of the Sitka Observa-

tory furnish the data for a study of these relations. A study is also being made of the relation of auroras to such transmission difficulties at the magnetic observatory at Sitka.

SEISMOLOGY

The great earthquake in Japan during the last fiscal year has called attention to the importance of seismological investigation. There is more concern than ordinary in this subject in the United States and the regions under its jurisdiction. Major earthquakes have occurred in the United States along the Atlantic coast and Mississippi River, the Pacific coast, and in the St. Lawrence Valley; also in Porto Rico and Alaska. During the past three years earthquakes have been felt in 28 States, many of them in regions which had not previously experienced them. A special investigation of earthquakes is now in progress in California by the cooperation of private institutions and Government bureaus. One of the aims is the study of earthquakes in general, but the investigation is for the very practical purpose of determining the possibility of prediction and of designating the areas where special precautions in construction should be used and where buildings of large proportions and great dams should be avoided. In addition to the work in the California region, other parts of the United States should be studied.

In order to study earthquakes, instruments known as seismographs must be operated at fixed observatories. They should be of the highest type, continuously operated by skilled observers in order that the earthquake records may be correctly interpreted. This bureau has operated seismographs at five widely separated stations for 20 years, but as the work has been supplemental to magnetic work, the stations have not been equipped with the instruments which have been developed during that time.

TIDAL OBSERVATIONS

The regular tidal observations at principal tidal stations of the survey were continued during the year. Eight gauges were kept in operation on the Atlantic coast, three stations on the Gulf coast, five on the Pacific coast, two stations in Alaska, and one in the Hawaiian Islands. Short series of tidal observations were made at various points along the coasts in connection with regular hydrographic surveys. A comprehensive current and tide survey of San Francisco Bay and tributaries was made in the fall of 1923. With the cooperation of the Bureau of Lighthouses with the survey, current observations were made on two light vessels stationed along the Atlantic coast and two on the Pacific coast. The new portable automatic tide gauge developed the past year by the survey has been manufactured in quantity and furnished to field parties for obtaining tidal observations for the establishment of datum planes for the reduction of soundings. This small automatic gauge can be installed in an hour and fills the place of the hired observer in addition to furnishing a better and continuous record.

SAN FRANCISCO HARBOR CURRENT AND TIDAL SURVEY

It has been recognized for some time past that comprehensive and detailed current surveys are necessary in our large and important

harbors. This has been necessary not only for purposes of navigation but as well for predictions of the currents in connection with admiralty cases, for which data are continually being requested of the department, and also for the use of the Federal engineers in harbor improvement and development. This important matter was brought to the attention of Congress, and an appropriation of $15,000 made for the fiscal year 1923 to cover the cost of such a survey of New York Harbor. The following year a like amount was appropriated for a similar survey of San Francisco Harbor.

A comprehensive current and tide survey of San Francisco Harbor was made during the fiscal year 1924, and definite knowledge of the tide and current phenomena for that harbor is now available. To the navigator the current tables issued by this survey are of invaluable aid, since they inform him in advance of the time of slack water and the time and velocity of the strength of current—the first of considerable importance in the berthing of large vessels, the second, in keeping account of the position of the vessel in thick weather.

Aside from the importance of the survey to the mariner, the by-products, which are obtained at no increased cost, are of importance to the engineer. The Federal engineer engaged in harbor improvement (both of a civil and a military nature) or in wharf construction, etc., can undertake his work with a better knowledge of the current and tide conditions under which the operations will be carried on.

The data from the survey of New York Harbor have been computed and the results interpreted and discussed. The manuscript of a publication covering in detail the tide and current phenomena of each section of the harbor is now in press. The data from the San Francisco survey are now being computed, and after being correlated with the various scatered observations made at different times in previous years the conclusions will be issued in a publication similar to that for New York Harbor.

DELAWARE BAY AND RIVER CURRENT AND TIDAL SURVEY

The current and tide surveys of the various harbors are being taken up in the order of their importance from a civil and military standpoint and with reference to the needs of the mariner. The Federal engineers charged with the development of the harbor of and approaches to Philadelphia have requested that that port be the next taken up.

In the case of each of these current and tide surveys, conferences are held when planning the work with the United States Engineers in the district, and their cooperation has been freely given in every way possible.

What has been done in New York and San Francisco Harbors in the past two fiscal years is now planned for Delaware Bay and tributaries, for in addition to the value of such a survey to the Federal engineers a knowledge of the behavior of the currents is of great importance to shipping. Beginning in July, 1924, a comprehensive tide and current survey is to be made in Delaware Bay and tributaries, and as soon as possible the results of this survey will be made available.

COOPERATION WITH OTHER AGENCIES IN TIDE AND CURRENT WORK

Since Seymour Narrows is in British Columbia waters, the Coast and Geodetic Survey had no data of its own upon which to make accurate predictions of the time of slack water, and while the straits are not United States waters, accurate predictions of the times of slack water of the extremely strong currents are of considerable importance to United States vessels plying between our Pacific Northwest and southeast Alaskan ports. The Canadian Tidal and Current Survey, with a fine spirit of international cooperation, has provided the survey with three months of observations made by them in the summer of 1923. From these observations it is expected to make a decided improvement in the value of the United States predictions of slack water in this important thoroughfare.

Another example of cooperation in tide and current work which has continued during this fiscal year between Canada, England, and the United States is the exchange of predictions for a number of ports, which are published both in the British Admiralty and the United States Tide Tables.

In order to obtain oceanographic data in the Arctic, the survey is cooperating with the National Geographic Society by the loan of a number of current and other oceanographic instruments to Capt. Robert A. Bartlett. Under the direction of the National Geographic Society, Captain Bartlett is going to northern waters on a summer cruise of the United States Coast Guard steamer *Bear*.

The survey is also cooperating with the Department of Operation and Maintenance of the Panama Canal by the loan of instruments for the observations of currents on the lighthouse tender *Favorite* in the vicinity of Serrana Bank and Quita Suena Reef in the Caribbean Sea. The information obtained will be forwarded to the survey for analysis.

Three requests have been received from foreign countries for information relative to the portable automatic tide gauge recently developed by the survey with a view to its adoption in harbor work—from the Harbors Board of the Government of South Australia, at Adelaide; from the Rockhampton Harbors Board, Rockhampton, Queensland, Australia; and from the Harbor Department of Public Works, Rotterdam, Holland.

CHARTS AND PUBLICATIONS

During the fiscal year the survey continued its task of furnishing to the maritime public correct and up-to-date charts on which were incorporated the data obtained in the mass of information reaching this office in a constant stream from sources both within and without the service. It also made gratifying progress in the production of new charts resulting from the recent completion of surveys by our field parties.

The quantity of the bureau's service is measured in the long run by the volume of charts issued, the demand for charts being determined by economic conditions. The distribution of charts in any one year is not a measure of their value in comparison with that of some alternative product, but rather an indication of the relative

activity of certain agencies of the Federal Government and of the fluctuations in economic conditions as they affect merchant shipping and those classes of our people who look to the sea for recreation.

The total number of charts disposed of during the year was 221,543. This total constitutes a slight increase over that for 1922 and 1923. The sales, however, are slightly less than in 1923, the increase being in the free issue column, particularly in the issue of charts to the Navy Department. In the improvement of the quality of our charts we have made continued progress. Every new or reconstructed chart which comes off the press results in a better quality of service to the mariner.

UP-TO-DATE CHARTS

At item deserving major emphasis is the frequency with which our charts are printed. Our coasts and harbors are undergoing a constant and rapid evolution. Radical changes in certain of the areas covered by the charts are constantly being reported. The prompt charting of these changes is considered of such importance to the safety of navigation that it is given precedence over all other work. In order that the charts may be kept correct with respect to these changes, they are printed frequently in small editions.

Thus, during the year just ended, while the number of charts disposed of was 221,543, the average stock carried was only 89,293. The resulting turnover of stock is 2.5 times for all charts. As a matter of fact, the actual service rendered is even more creditable than is indicated by these figures. For example, chart 8550, Prince William Sound, Alaska, covers an important but unchangeable area. This chart has been printed only twice during the last four fiscal years. Conversely, chart 369, New York Harbor, was printed five times during the past fiscal year and was in hand for a sixth printing at the close of the year.

I think we may fairly assert that our service in this respect is unequaled by any other principal maritime nation, although it is proper to add that probably no other nation is confronted to the same extent with this problem of rapid and constant evolution.

During the year the bureau undertook two new projects, each representing an improvement in the quality of service to the public. These projects were, first, charts showing results of wire-drag work in Alaska, and, second, a new series of charts of the inland waters from Norfolk to Key West, prepared with special reference to the needs of motor boatmen.

WIRE-DRAG CHARTS

For some years the survey has been making wire-drag surveys of those areas of the United States and its possessions where are found abrupt inequalities of depth. The dangers discovered during the course of this work have been charted promptly, and to that extent we have afforded additional security to vessels. We have also told the mariner in a general way that certain waters have been dragged and the dangers discovered charted, but we have not heretofore informed him definitely as to the areas to which that assurance applied.

During the year, therefore, the survey adopted a method of showing on the charts of southeast Alaska the areas which had been swept in such a manner as to safeguard navigation. Alaska was chosen for this first attempt, because the great depth and ample width of channels had greatly simplified the results obtained. The easiest task was chosen first in the hope that our experience there might aid in the solution of the problem in more difficult areas elsewhere. A number of the charts of southeast Alaska have now been issued containing this information, and it is being applied to the remaining charts of that area as rapidly as they come up for reprint.

INSIDE-ROUTE CHARTS

The program of chart production for the year included a new series of 10 charts showing the inside route from Norfolk to Key West. The series was designed especially to meet the requirements of motor boatmen cruising in this section of the coast. There has been a tremendous increase in recent years in the number of craft of this character.

On the series of general coast charts these waters are covered by 25 charts; scale, 1:80,000. In this series the number was reduced to 10 charts on the same scale by charting the route in strips, usually three strips to the chart, thus eliminating much general detail of no particular value to boats making this trip.

Very truly yours,

E. Lester Jones,
Director, Coast and Geodetic Survey.

BUREAU OF NAVIGATION

DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, July 1, 1924.

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, 1924, comprised 26,575 vessels of 17,740,557 gross tons, compared with 27,017 vessels of 18,284,734 gross tons on June 30, 1923, a decrease of 442 vessels of 544,177 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, 1924, as 61,514,140 gross tons, of which Great Britain and Dominions have 21,546,044 gross tons, and the United States is second with 12,430,596 gross tons (excluding the Great Lakes).

Of the total world seagoing tonnage, amounting to 32,956 vessels of 64,023,567 gross, 912 Shipping Board vessels of 3,847,856 gross tons and 345 privately owned American vessels of 713,681 gross tons were laid up on June 30, 1924.

On January 1, 1924, according to the Chamber of Shipping of the United Kingdom, there were laid up at the principal ports of the United Kingdom 301 ships of 908,377 gross tons as against 371 ships of 1,007,829 gross tons on January 1, 1923.

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 1923, and on June 30, 1924:

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*
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
1923	27,017	18,284,734	1,498	6,861,241	2,035	6,242,547	2,719	2,758,401	20,765	2,422,545
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, 1924, there were building in American shipyards, including the Great Lakes, 222 vessels of 185,077 gross tons, as compared with 208 vessels of 173,305 gross tons on June 30, 1923.

On June 30, 1924, the tonnage under construction in the world was 786 vessels of 2,616,897 gross tons, as compared with 765 vessels of 2,543,856 gross tons on June 30, 1923. This construction on June 30, 1924, included, according to Lloyd's Register, 1,551,671 gross tons for the United Kingdom and British Dominions, 320,254 for Germany, 144,240 for France, and 66,654 gross tons for Japan. Of these vessels under construction 8 are over 20,000 tons, the larger number—366—being under 2,000 tons; the average throughout the world is a little over 3,329 gross tons.

LOAD LINE

It is now generally accepted that legislation on this subject is needed; first, in the interest of safety, and, second, in the interest of the commercial standing of our great fleet of ocean-going cargo steamers.

There is now before Congress Senate bill No. 1319, "To establish load lines for certain vessels." The subject matter of the bill being technical, you requested a specially qualified committee of experts to give its provisions consideration. The committee consisted of Rear Admiral D. W. Taylor, chairman; Homer D. Ferguson, president, Newport News Shipbuilding Co.; E. C. Plummer, commissioner, United States Shipping Board; David Arnott, American Bureau of Shipping; and Hendon Chubb, marine underwriter.

This committee approved, as follows, the proposed legislation on two broad considerations:

> First, safety of the vessel and crew and the avoidance of damage and extensive repair inevitable with inadequate freeboard, and, second, the fact that all the leading maritime nations have different load-line regulations, and their laws require foreign ships loading in their ports to comply with their several detailed requirements unless the nation concerned has its own load-line regulations. The United States is now the only maritime nation of any importance whose commerce is liable to be hampered by the lack of load-line legislation and regulations.
>
> As regards the first consideration, it applies more strongly to overseas commerce than coastwise commerce, particularly to overseas commerce with the leading maritime nations of western Europe. There is less risk in coastwise navigation and much less risk involved in the conditions of navigation upon our Great Lakes.
>
> As regards the second consideration it applies solely to overseas commerce. Obviously the great need for legislation at present is with reference to vessels handling overseas commerce, and this most important need should be met by legislation as soon as possible. Legislation as regards vessels handling other classes of commerce may be deferred until the great need has been met and experience had in dealing with overseas vessels.
>
> * * * Since one important desideration of legislation is to put the United States upon a par with the maritime world generally in this load-line matter it is desirable to insure that our practice shall harmonize with that of other nations and that the law shall express definitely the intent that our vessels shall not be put at a disadvantage in this connection.

You therefore approved the recommendations of the committee that the pending legislation be amended in accordance with the above, as well as several other minor amendments affecting the administration of the law.

RADIO COMMUNICATION

Safe navigation of merchant vessels depends largely upon efficient radio equipment, which is required by the act of June 24, 1910. It

is necessary to inspect such equipment frequently to insure its efficient condition and give the contemplated protection to the traveling public. During the past year there were 7,721 such inspections made on American and foreign vessels coming under the above act, as compared with 6,933 the previous year. During the same period 1,577 inspections were made of ships voluntarily equipped, compared with 1,124 the previous year; and 974 American ship stations were inspected for licenses, compared with 644 the previous year. There are 2,741 American ships equipped with radio, not including Government vessels.

The radiocompass on shipboard provides further safety to navigation. The latest available records show 291 vessels equipped with this type of apparatus, not including naval vessels of various countries. It seems evident that this device will soon come into more general use when its value is more fully realized.

Insufficient operating channels for marine service have resulted in some congestion at the large ports where traffic is heavy, and some way of overcoming this difficulty will be sought when the next radio conference is held, probably the latter part of the present summer.

To remove the intolerable interference with broadcast reception caused by ship stations and shore stations working with ships it was necessary to prohibit such stations using the wave length of 450 meters within the broadcasting band and substitute wave length of 796 meters.

Broadcasting is permanently established. Experience and experimentation are rapidly developing and improving this service. The success achieved in this country has encouraged many other countries to utilize this important means of establishing direct contact with the public. It is not yet possible to predict with any degree of accuracy what benefits will ultimately accrue to the American people as a result of this new field of endeavor in the radio industry. Each year furnishes further evidence of its usefulness.

Class B broadcasting stations have increased during the year from 42 to 54, class A from 203 to 378, and class D from 1 to 2. There has been a decrease in class C stations from 327 to 101. These changes show a total of 535 broadcasting stations on June 30, compared with 573 a year ago. Broadcasting began September, 1921. Since then 1,076 such stations have been licensed, and of this number 541, or a little more than 50 per cent, have been discontinued.

There have been no marked changes in the transoceanic radio situation. It is understood deferred service is accepted for transit through the new station at Monte Grande, Argentina.

No figures are available showing so much as an estimate of the number of persons employed in the radio industry. The bureau's records show the number of commercial operators licensed during the past fiscal year was 3,370, compared with 2,860 the previous year. This is the first year showing a decrease in amateur radio activity. Last year there were 16,570 licensed amateur transmitting stations, compared with 15,540 licensed during the year just ended.

ADMEASUREMENT OF VESSELS

During the present Congress there was introduced H. R. 8915, "A bill to provide for the establishment in the Department of Com-

merce, Bureau of Navigation, of a division of admeasurement of shipping."

This bill proposes to divide the country into 10 admeasurement districts, each in charge of a man thoroughly qualified for the work. He will be furnished with trained admeasurers, who will work under his supervision and for whom he will be responsible. The salaries provided should enable us to secure first-class men. When the service is established, it will form the basis for the organization of the marine forces now under the Treasury Department, but performing work exclusively under the direction of the Secretary of Commerce.

The necessity for this legislation in the interest of our merchant marine is becoming more apparent. The present awkward and unbusinesslike system of the Commissioner of Navigation performing his statutory duties through the employees of another department necessarily is resulting in American admeasurement being far below the standard of other maritime nations, involving numerous discriminations against our vessels, delay in performing the work, and unnecessary cost.

The proposed segregation of the services have been approved by the President, the Secretary of the Treasury, and the Bureau of the Budget as being in the interest of ultimate economy and efficient administration.

ENFORCEMENT OF THE NAVIGATION LAWS

During the fiscal year there were reported to the department for mitigation or remission of penalties 8,867 violations of the navigation laws, a decrease of 2,384 from 1923. From close observation the bureau is satisfied that there is an increasing compliance with the laws it is enforcing. This is due in part to the efforts of our inspection forces, and perhaps in an equal degree to cooperation by vessel owners in the equipment and navigation of their vessels. While the number of infractions of the law reported is still too large, a considerable majority of the cases involve only technical violations not involving the safety of the ship, her passengers, or cargo.

Our five inspection vessels operating along the Atlantic and Gulf coasts during the year made 22,390 inspections and reported 4,314 violations of law as compared with 5,504 such cases during 1923.

The revenue from the activities of these small vessels continues to exceed the cost of their operation. During the year they caused to be turned into the Internal Revenue Bureau $50,599.36 in delinquent taxes on pleasure vessels and penalties under sections 703 and 1003 of the revenue acts of 1924 and 1921, respectively. The Commissioner of Internal Revenue in reporting this result stated that "the services of these officers are valuable to the Government in this particular class of investigations because of their special qualifications and facilities for properly determining the correct admeasurement of vessels liable to tax." In addition to the revenue mentioned, the navigation fines imposed and the indirect effect on internal-revenue collections render the service more than self-sustaining. It is fortunate that this service engaged in safeguarding life and property along the Atlantic and southern seaboard is operated without cost to the Government.

As stated in my report last year, it is apparent that similar results may be obtained by an extension of our inspection service to the Great Lakes, the Pacific coast, and the inland rivers. Perhaps the most economical way this could be accomplished would be through the employment of five qualified men—two for the Great Lakes, two for the Pacific coast, and one for the Mississippi River and tributaries. Such a service should cost not to exceed $30,000 annually. In addition to the enforcement of the navigation laws and collection of internal-revenue taxes, these men would be of great assistance in securing uniformity in the marine divisions of the customhouses in the administration of the general laws affecting our merchant marine. That the service would pay its way is demonstrated by the similar service on the coast. This service has directly to do with the safety of lives and property, and I feel justified in strongly urging its extension.

Under the numbering act of June 7, 1918, there have been recorded in the customhouses as of June 30, 1924, 179,559 undocumented power vessels. The value of this law is increasing with the growing need of means for identifying these small vessels which are so well adapted to infringement of our laws against smuggling.

MITIGATION AND REMISSION OF PENALTIES

The number of violations of the navigation laws reported from all sources to the department for mitigation or remission has decreased from 11,251 in 1923 to 8,867 in 1924, a decrease of 2,384. Few of these violations were flagrant or actually involved safety to life or property. Most of them were technical, and many could not have been avoided even by the exercise of unusual vigilance on the part of the master. In comparing the number of inspections with the number of violations discovered and the technical nature of such violations, it is evident that the policy of the department to show leniency to first offenders is accomplishing the desired results without unnecessary hardship to the owners of vessels, who are showing their appreciation of such action through cooperation and obedience to the law. We seldom have a master reported twice for the same offense.

SHIPPING COMMISSIONERS

During the year 555,633 officers and men were shipped, reshipped, and discharged before shipping commissioners, compared with 538,755 for the previous fiscal year and 378,772 for the year 1914. The average cost per man was 17 cents, the same as for 1923 and 1914. Collectors of customs acting at ports where shipping commissioner offices have not been established, shipped and discharged during the year 58,446 officers and men as compared with 48,932 officers and men during the previous year. American consuls shipped and discharged during the year 41,256 men.

Of 280,143 officers and men shipped before shipping commissioners, 116,421 were native Americans, 41,195 naturalized Americans, 157,616 in all, or 56 per cent.

The bureau has endeavored to compile 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 fig-

ures are subject to correction as trade, motive power, or 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.

The signing on vessels and discharge of seamen at Mobile, Ala.; Los Angeles, Calif.; and Portland, Oreg., continues in such volume as to warrant the establishment of shipping commissioners' offices at those ports.

The service, even under the tentative reclassification, is seriously underpaid. The salaries allotted to shipping commissioners are fair, but the amount allotted to the deputies is inadequate. They are practically all in the minimum of their grades, the older, experienced deputies receiving the same pay as recent appointees to that grade. We are endeavoring in our estimates for next year to remedy this condition.

PREVENTING OVERCROWDING OF PASSENGER STEAMERS

During the fiscal year passengers were counted on 10,141 trips of excursion steamers, the number of passengers aggregating 5,775,279. Of this number navigation inspectors made 7,104 counts of 2,547,742 passengers. On 384 occasions it was necessary to stop passengers going on excursion boats, the limit of safety having been reached. This involved the safety of 174,098 passengers.

So far as the bureau can determine from the daily reports of the work of this service during the present season, we are securing a fairly reasonable supervision of excursion steamers at all of our principal ports. The increase in the appropriation for this purpose during the current year has been effective.

PASSENGER ACT OF 1882

During the year 1,235 vessels entered our ports, bringing to the United States 348,989 steerage passengers, the largest number since 1921. On 12 voyages only were violations of the law discovered, and with two exceptions they were of a technical nature. The law which protects the health, comfort, and morals of these passengers is being very generally complied with but under adverse circumstances. The habits and customs of the various nationalities do not always conform entirely to the accepted ideas of hygiene or morals.

NAVIGATION RECEIPTS

The receipts from tonnage during the fiscal year amounted to $1,713,432.68, compared with $1,688,786.68 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 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
1924	$1,713,432.68	$212,825.46	$46,157.78	$1,972,415.92
1923	1,688,786.68	221,678.56	36,914.62	1,914,379.86
1917	1,393,743.16	159,808.03	49,962.37	1,603,513.56

The accounts covering these various collections receive administrative examination and check in the bureau in Washington. These various charges are imposed on American and foreign vessels alike, and consequently 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, 1923 and 1917, were as follows:

June 30—	Bureau	Shipping service	Tonnage adjustment	Counting passengers	Navigation laws	Wireless laws	Total
1924	$42,780	$110,600	$3,760	$10,250	$75,000	$139,200	$381,590
1923	42,780	110,600	3,760	10,250	60,000	130,000	357,390
1917	37,780	74,425	3,000	18,250	26,500	45,000	204,955

It will be noted that the receipts of collections are about five times the cost of operating the bureau through its direct appropriations. These appropriations, however, cover only a part of the expenses of the service, much of the work being performed through customs officers acting for this bureau but appropriated for and paid through the Treasury Department.

Very truly yours,

D. B. CARSON,
Commissioner of Navigation.

STEAMBOAT INSPECTION SERVICE

DEPARTMENT OF COMMERCE,
STEAMBOAT INSPECTION SERVICE.
Washington, July 1, 1924.

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:

TRAVELING INSPECTORS IN WASHINGTON

The three traveling inspectors, authorized several years ago, who were to function directly under the Supervising Inspector General, one with headquarters in Washington, one in San Francisco, Calif., and one in Cleveland, Ohio, have proved an increasingly effective arm for the Supervising Inspector General to reach into the districts and obtain that uniform administration of the law with which, under section 4403, he is charged. It has, however, been concluded, after mature consideration, that the efficiency of the traveling inspectors will be increased by having them all stationed in Washington, and arrangements will therefore be made to accomplish this result.

These men will, as heretofore, be sent out to check up the work of inspection and of investigations made of complaints lodged with local inspectors. Another important feature in which the bureau purposes to use the traveling inspectors more effectively is in the investigation of complaints lodged in the central office with reference to conditions of equipment, insufficient crews, etc., alleged to exist on vessels.

STABILITY TESTS

Reference has been made in previous annual reports to work done in inclining vessels. That work has been steadily increasing and, by rules passed by the board of supervising inspectors, will continue to increase. Up to the present time the work has been performed by the traveling inspector with headquarters in this office. The work has so increased that it is not now possible for him to do all of it himself, and the bureau purposes to meet the demand, not by asking Congress for more money, but by having the other traveling inspectors stationed in Washington, where they can also participate in the work of making stability tests. In a word, the work will go forward, the ships will be inclined, and without asking more money from Congress. This is cited as an example of efficiency and economy, and undoubtedly will have your support.

EXAMINATIONS FOR LICENSES

For many years the bureau has given consideration to examinations for licenses with particular reference to uniformity. Many who are unsuccessful in obtaining license contend that the examinations are too rigid. Some labor leaders and men conducting nautical schools are of the opinion the examinations are not rigid enough and that we obtain an inferior class of officers and, incidentally, a greater supply than demand, resulting in the lowering of wages. It is to be remembered that in the examination and licensing of applicants the local inspectors have original jurisdiction, yet in the carrying out of the provisions of section 4403, Revised Statutes, the Supervising Inspector General has the authority to advise the local inspectors in such manner as to obtain uniformity.

In facilitating business it would never be practicable to conduct examinations in the same manner as the Civil Service Commission, but we can, by preparing questions of the highest class and sending them to the local inspectors, obtain a uniform result, so far as standard goes, letting the local inspectors ask any additional questions.

PERSONNEL

Mention has been made in previous annual reports of the necessity, in the interest of economy, of separating 39 employees from the pay roll in July, 1921. All these employees have been reinstated except 7, and it is hoped that by the end of the present calendar year all may be reinstated. When they were separated, it was with the understanding that they would be reinstated as rapidly as vacancies occurred. It was not possible, however, to reinstate all under the rules of the Civil Service Commission providing for a certain period of eligibility, and therefore it was necessary to obtain an Executive order to extend their eligibility. Great pressure has been brought to bear, at times strong politically, to give reinstatement to persons who did not have priority over those who were laid off under the economy program, but the bureau has consistently recommended the reinstatement of those persons whom it promised it would reinstate, and takes pride in stating that the promise and obligation of putting these persons back has about been carried out.

RETIREMENT

The retirement law was intended not only to provide for the persons who were to be retired, but to improve and maintain the standard of efficiency. In a service where we are responsible for the safety of life and property, we must put out of our minds all thought of the person and think only of our responsibility. For positions as inspector in this service the Civil Service Commission will not examine a man over 55 years of age, and this being a fact, surely we can not be considered illogical when we recommend the retirement of a man of 75.

LEGISLATION

There is certain legislation that is desired for this service. It is very desirable that sections 4433 and 4418, Revised Statutes, in re-

gard to the working and hydrostatic pressure of boilers, be amended. This will enable the service to make modern the rules and regulations covering these matters, but this can not be done until authority is given by Congress.

It is also desirable to amend section 4426, Revised Statutes, so as to give this service the authority to require on motor boats of over 15 gross tons, carrying freight or passengers for hire, the same life-saving equipment as that required on steamers subject to inspection.

Section 4404, Revised Statutes, should be amended so as to include the supervising inspectors under the classified civil service.

ORGANIZATION

The following positions were embraced in the Steamboat Inspection Service at the close of business on June 30, 1924:

At Washington, D. C.:	
Supervising Inspector General	1
Deputy Supervising Inspector General (who is Acting Supervising Inspector General in the absence of that officer)	1
Private secretary to the Supervising Inspector General	1
Clerks	10
Messenger	1
In the service at large:	
Supervising inspectors	10
Traveling inspectors	3
Local inspectors of hulls	46
Local inspectors of boilers	46
Assistant inspectors of hulls	75
Assistant inspectors of boilers	75
Clerks to boards of local inspectors	95
Total	364

The local inspection districts of Apalachicola, Fla., and Burlington, Vt., have been abolished by an act of Congress approved April 18, 1924, effective on date of approval. The work of the Apalachicola district has been taken over by the local inspectors of the district of Mobile, Ala., and the work of the Burlington district by the local inspectors of the district of Albany, N. Y.

During the year three additional clerks were appointed in the field in offices of local inspectors—one at New York, N. Y., one at Detroit, Mich., and one at Mobile, Ala.

STATISTICS

The force inspected and certificated 7,560 vessels, with a total gross tonnage of 14,601,603, of which 7,225 were domestic vessels, with a total gross tonnage of 11,380,783, and 335 were foreign passenger steam vessels, with a total gross tonnage of 3,220,820. Of the domestic vessels there were 5,832 steam vessels, 848 motor vessels, 18 passenger barges, and 527 seagoing barges. There was a decrease of 93 in the total number of vessels inspected and a decrease of 381,247 in the total gross tonnage of vessels inspected as compared with the previous fiscal year. There were 862 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 33 steam vessels, with a total gross tonnage of 1,159. There were inspected for

the United States Government 47 hulls of vessels and 2,029 boilers. There were 2,639 reinspections of steam vessels, motor vessels, and barges.

Licenses were issued to 22,465 officers of all grades. There were examined for visual defects 7,130 applicants for license, of whom 22 were found color blind or with other visual defects and rejected. Certificates of service were issued to 13,034 able seamen, and 913 were rejected. Certificates of efficiency were issued to 8,673 lifeboat men, and 6,960 were rejected.

Steel plates for the construction of marine boilers to the number of 2,119 were inspected at the mills, and a large amount of other boiler material was inspected. There were examined and tested 161,855 new life preservers, of which 3,414 were rejected. There were inspected 7,325 new ring life buoys, of which 442 were rejected. There were inspected at factories 504 new lifeboats, of which 6 were rejected. There were inspected at factories 103 new life rafts, of which 2 were rejected.

The total number of accidents resulting in loss of life was 201. The total number of lives lost was 297, of which 54 were passengers. Of the lives lost, 180 were from suicide, accidental drowning, and other similar causes, leaving a loss of 117 as fairly chargeable to accidents, collisions, founderings, etc. There was an increase of 50 in the number of lives lost as compared with the previous fiscal year.

Passengers to the number of 344,658,611 were carried on vessels required by law to make report of the number of passengers carried. Dividing this number by 54, the total number of passengers lost, shows that 6,382,566 passengers were carried for each passenger lost. The number of lives directly saved by means of the life-saving appliances required by law was 620.

Very truly yours,

GEORGE UHLER,
Supervising Inspector General.

INTER AMERICAN HIGH COMMISSION

INTER AMERICAN HIGH COMMISSION,
Washington, July 1, 1924.

Hon. HERBERT HOOVER, Chairman,
United States Section, Inter American High Commission.

MY DEAR MR. CHAIRMAN: During 1923–24 the work of the United States Section of the Inter American High Commission has been conducted along somewhat different lines than in preceding years. It was found that the actual calling of the members to the city of Washington not only meant serious inconvenience to some of them who reside in distant localities, but frequently necessitated postponement of meetings and, if not lack of quorum, at least incomplete attendance. It was decided that since the general policies are now well established and defined it would be sufficient to keep the members informed, through periodic communications, of progress realized, also requesting any comments and suggestions they might care to make; in this way fewer actual meetings would be necessary and such as were held could be devoted exclusively to the consideration of special questions and to full discussion of major topics affecting the policies of the commission.

Besides several communications of relatively minor importance, two special memoranda have been distributed by the secretary among the members of the section, to wit:

Memorandum No. 1, dated April 25, 1924, containing a detailed report of a visit made by the Secretary General to the Cuban Section, and the results of conferences held with that section.

Memorandum No. 2, dated May 14, 1924, containing a report showing progress made on various topics of the program since October 2, 1923.

One of the most important results of the conferences held in Cuba was the designation by the executive of that country of a plot of land on which to build the office for the Inter American Bureau for the Registration of Trade Marks. This land is situated in the center of the business section of Habana, adjacent to the Departments of Finance and Agriculture. It is one square from the United States Embassy, two squares from the chamber of commerce and the wharves, three squares from the post office, the City Hall, the Senate, the Department of War, and less than six short squares from the Departments of Justice, State, and Interior, and from the Chamber of Representatives.

The value of the land has been variously estimated. Advices recently received permit us to make a tentative estimate of the surface and value of the plot as follows:

Surface, 13,413.30 square feet, at a valuation of $11.62 per square foot, making a total value of	$155,862.55
To this the Cuban Government adds a contribution in money amounting to	25,000.00
Grand total	180,862.55

A majority of the marks protected under the Inter American Convention are owned by citizens of the United States; the building should be erected as soon as possible in order to afford proper security for these. An appropriation of $154,177.04, as the quota of the United States toward the construction of the building—to cost approximately $200,000—has been requested.

The United States Section has given special attention to preparations for the conferences to be held in accordance with the resolutions of the Fifth International Conference of American States. One important undertaking was the organization of a visit of Latin American road engineers to the United States. At the invitation of the chairman of the United States Section, the Highway Education Board acted as host to the visitors. The visit was financed by motor and related industries. There were representatives from all the American countries except Haiti. An extensive inspection trip started on June 2 and lasted nearly a month. The visitors examined different types of roads in North Carolina, Illinois, Minnesota, Michigan, and other States. They were constantly under the guidance of State engineers who had been engaged in the construction of roads, the United States Commissioner of Roads, and various State commissioners of roads; these explained the different aspects of the many problems of road construction and maintenance. The secretary of the United States Section accompanied the visitors. As a result of this trip the Pan American Highway Commission was organized, and the basis of a program for the conference on motor roads, to be held in Buenos Aires next spring, was submitted to the Pan American Union. This visit has produced considerable effect in Latin American countries where important movements for road construction have been started. While the visitors were in this country, the United States Section kept the other national sections of the commission informed of all developments and provided them with copies of the program and other material of interest.

The United States Section also participated, with the assistance of officials of the Department of Commerce, in the distribution of material in preparation for the conference on electrical communications, which recently took place in Mexico City; the section is now engaged in arranging the necessary material and securing competent treatment of the subjects to be discussed at the conference on standardization of specifications, to be held at Lima, Peru, in December of this year.

Conventions for the arbitration of commercial disputes between the United States Chamber of Commerce and similar organizations in Habana, Cuba, and San Jose, Costa Rica, are in process of negotiation.

The following conventions have been ratified during the past fiscal year:

Convention concerning commercial travelers: Costa Rica and Peru.

Convention on publication of customs laws and regulations: Brazil, Costa Rica, Paraguay, and United States.

Convention on uniform classification of merchandise for statistical purposes: Brazil, Costa Rica, Paraguay, and United States.

Convention for protection of commercial, industrial, and agricultural trade-marks and commercial names (approved by Fifth International Conference of American States): Brazil.

Arbitration of commercial disputes: Brazil, Guatemala, and United States.

The report prepared by the United States Section on Company Laws in the American Continent is now being printed; as soon as this is completed the report on admiralty law will be published.

The work of the United States Section was greatly handicapped this past year by a substantial reduction in its appropriation; this condition has been partially corrected for the year 1924–25.

Respectfully,

GUILLERMO A. SHERWELL, *Secretary.*

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