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1922/23

OF THE

SECRETARY OF COMMERCE

1923



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1923

SECRETARY OF COMMERCE

ORGANIZATION OF THE DEPARTMENT.

[September 15, 1923.]

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Commissioner of Navigation.....	DAVID B. CARSON.
Supervising Inspector General, Steamboat Inspection Service.....	GEORGE UHLER.

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ELEVENTH ANNUAL REPORT
OF THE
SECRETARY OF COMMERCE.

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, November 1, 1923.

To the PRESIDENT:

I have the honor to submit herewith for transmission to Congress the Eleventh Annual Report of the Secretary of Commerce, in accordance with the provisions of section 8 of the organic act, as follows:

SEC. 8. That the Secretary of Commerce shall annually, at the close of each fiscal year, make a report in writing to Congress, giving an account of all moneys received and disbursed by him and his department, and describing the work done by the department in fostering, promoting, and developing the foreign and domestic commerce, the mining, manufacturing, shipping, and fishery industries, and the transportation facilities of the United States, and making such recommendations as he shall deem necessary for the effective performance of the duties and purposes of the department. He shall also from time to time make such special investigations and reports as he may be required to do by the President, or by either house of Congress, or which he himself may deem necessary and urgent.

In order to comply with these requirements and for convenience I have divided this report into the following sections:

- I. The general economic situation during the fiscal year.
- II. The general administrative work of the department.
- III. Investigations into various economic problems in pursuance of the organic act.
- IV. Recommendations in remedy of obsolete legislation and to meet new problems that have arisen in the department, that our commerce and industry may be advanced.
- V. Special and more detailed reports of the different bureaus and divisions of the department and special recommendations of their directors.

Part I.—GENERAL ECONOMIC SITUATION DURING THE FISCAL YEAR.

The Business Situation.

The fiscal year (July, 1922, to June, 1923) was marked by a complete recovery from the great slump of 1921 in all branches of industry save agriculture, and even in agriculture there was some improvement. This recovery had found a special impetus in the activity of building, railway, and other types of construction resulting from postponement during the war. It spread, however, to industry in general, so that the continuance of business activity is not dependent upon the maintenance of an equal measure of building construction hereafter.

The best measure of economic prosperity in industries other than agriculture is the volume of production and transportation. In these industries large production follows from active demand and may readily be coincident with advancing prices. Agricultural production is subject to decidedly different influences, as the prices for its major products are dominated by the European situation instead of our domestic needs, although full employment in this country at good wages has distinctly increased consumption, particularly of animal products.

The marked improvement in industrial activity is clearly brought out by the index numbers in the appended table of statistics (Table 1, p. 11). Although the latter part of the previous fiscal year already showed a decided upward movement, the manufacturing production of 1922-23 was nearly 25 per cent greater than that of the preceding 12 months. As compared with the bottom point of the slump, it showed an increase of more than 40 per cent. Production of minerals, forest products, and electric power, and construction of buildings showed approximately similar increases. The railroads hauled over one-fifth more freight (ton-miles) in 1922-23 than in the preceding fiscal year. All these indexes of economic activity for the fiscal year stood materially higher than during the very prosperous year 1919.

Especially conspicuous, naturally, has been the increase in the activity of those industries which manufacture chiefly articles entering into new construction and equipment, the demand for which is always peculiarly affected by waves of depression and prosperity. Pig-iron production, for example, during the fiscal

year was nearly double that in 1921-22 and at a rate three and one-half times greater than at the bottom of the slump.

Advance in the general business activity of the country appeared practically continuous from month to month throughout the fiscal year, and in most branches the close of the year marked the highest point attained. The only important exception was in the letting of building contracts, which fell off in the last five months of the fiscal year, partly because construction is beginning to catch up with the deferred requirements and partly because costs under the stimulus of demand had risen to unduly high figures. There is no reason to anticipate, however, that the decline in building activity will precipitate a general depression.

PRICES.—The business of 1922-23 was conducted on a distinctly higher level of prices than that of the preceding fiscal year, though the level is still, as unquestionably it should be for the best public interest, far lower than during the inflation of the war and the postwar boom. In general, there has been no feverish boosting of prices. Average wholesale prices during the fiscal year were 10 per cent higher than in 1921-22, 56 per cent higher than in 1913, but 37 per cent lower than at the peak of the postwar boom, in May, 1920. There was comparatively little fluctuation in the general level during the course of the fiscal year, the higher average resulting chiefly from the rather rapid increase which had taken place in the first half of the calendar year 1922. The general wholesale price index varied only from 155 in July, 1922, to 159 in April, 1923, and down to 153 in June. The higher level of wholesale prices during the fiscal year was shared by every group of commodities—not necessarily, of course, by every individual commodity—including farm products and foods. (See Tables 2 and 3, pp. 11 and 12.)

Retail prices, as usual, lagged behind wholesale. The average price for retail food was a little lower in the fiscal year than in the preceding one. A slight advance, however, set in during the summer of 1923. This situation of a moderate increase in wholesale prices, accompanied by stationary retail prices, gave stimulus to industry.

AGRICULTURE.—The situation in certain branches of agriculture continues unsatisfactory, though in most instances with distinct improvement. It should be clearly understood that by no means all branches of agriculture are suffering.

The fall in the prices of most major agricultural products after the boom was exceedingly violent—some fell even below prewar levels. Taking all important agricultural products together—

including some showing much less decline—the wholesale price index as compared with a pre-war base taken at 100, fell from 247 in January, 1920, to 114 in June, 1921, while all other commodities (including manufactured foods which are much affected by farmers' prices) fell from the same maximum to a minimum of 154. A considerable advance in the average prices of farm products began early in 1922. The average index for the fiscal year under review was 139, or 10 per cent higher than the average for the preceding fiscal year and more than 20 per cent higher than the minimum above mentioned. The advance was greater than that in other commodities, but as compared with normal pre-war ratios farm-product prices were still relatively a good deal lower than the average prices for other goods. The index for July, 1923, was the same as that for the July preceding. Wheat and hogs were exceptions, the prices averaging lower in 1922-23 than in the preceding year and lower at the end than at the beginning of the year. Cotton and corn have advanced materially. (See Table 2, p. 11.)

Unlike manufacturing and mining products, changes in volume of production on farms often do not reflect parallel changes in the prosperity of the agricultural community. The demand for most farm products is far less elastic than for most other products. In any case agricultural production can not adapt itself rapidly to changes in demand. The area planted to all crops combined in the United States has shown only insignificant variations in recent years, although standing about 10 per cent higher than before the war. Most individual crops also show little variation in acreage, although there has been a material decline in wheat acreage since 1919 and although cotton acreage shows a considerable increase in 1923 over 1922. Naturally the farmer can not suddenly change either his aggregate plantings or the proportion planted to the different crops. Short-time variations in crop production are due more to weather conditions than to human will.

Again, while large production and advancing prices are likely to go hand in hand in the case of manufacturing and mining industries, the opposite more frequently occurs in agriculture. In the case of several of the important agricultural products the prices are much more dependent upon conditions abroad, especially in Europe, than in the case of most manufactured and mineral products. A conspicuous illustration is the fact that the prosperity of the United States during the past year or two has meant only a moderate increase in domestic demand for wheat, so that its price has been primarily dependent upon the foreign market.

The situation in most branches of agriculture seems to be gradually adjusting itself. The partial recovery in foreign demand for cotton has permitted a higher price for the crop of 1923 than for that of 1922, in spite of an increase of 14 per cent in acreage and an appreciable increase in production. While the prices of hogs have been somewhat lower of late, the relatively high prices of corn, which is chiefly fed to livestock, seem to indicate confidence of cattle and hog raisers in the future. The dairy industry in general is prospering, the demand for dairy products varying more than that for most other agricultural products with general movements of prosperity and depression in industry. As for wheat, which is more dependent on foreign markets than any other agricultural product and which is subject to greatly increased competition from Canada and other foreign countries, it seems necessary gradually to reduce acreage. Wheat planting had been stimulated during the war more than that of any other crop, increasing to a maximum over 50 per cent higher than the average for 1909-1913. The acreage planted in 1923, though one-eighth less than in the year preceding, was still about 15 per cent above that before the war. With the gradual growth of domestic consumption, due chiefly to increase in population, the output of the pre-war acreage could at present practically all be consumed in our own country.

Financial Review for the Fiscal Year.

From the standpoint of financial conditions the fiscal year under review opened auspiciously, chiefly as a result of the marked revival in trade and industry that had been under way for several months, despite the coal and other strikes then in progress.

Much had been accomplished during the first half of the calendar year 1922 in the liquidation of the frozen credits accumulated in the previous year. The loans and discounts of the Federal Reserve banks and of the member banks had reached a minimum, while the returns of the reporting member banks of the Federal Reserve system showed their largest investment holdings up to that time. Rates on both call and time money had fallen below 4 per cent.

The banks of the country as a whole, with the exception of those in certain agricultural districts, were therefore in excellent condition to meet the requirements of expanding production and distribution of commodities. This condition continued throughout the fiscal year. Bank loans and discounts began to increase in the later months of 1922 and reached their maximum in the middle of May, 1923, continuing substantially at this level through June. Nevertheless, there were at all times ample bank-

ing accommodations to finance industrial and commercial requirements, even at their peak.

Differences between the industrial and agricultural sections of the country with respect to the revival of industry and the use of bank credit are, however, to be noted. In April, 1922, the proportion of the total volume of rediscounts of the reserve banks which were made for banks in cities of 100,000 and over and for banks in cities of less than 15,000 was approximately the same, namely, 42 per cent; while in April, 1923, the proportion for the large cities was 75 per cent and for the small cities about 15 per cent. This change in proportions is largely a reflection of the marked improvement in trade and industry as compared with agriculture in the year ended April, 1923.

At the close of the fiscal year the banking situation continued to be essentially sound. In the early months of 1923 the banks had wisely restricted the extension of credit to the legitimate needs of business and had thus played a large part in the prevention of inflation which many feared would result from the pronounced upward tendency of prices.

With reference to the Federal reserve banks, it is to be noted that the marked increase in trade did not result in any extensive use by the member banks of their rediscount privileges. While the volume of discounted bills outstanding July 18, 1923, was about 80 per cent higher than the amount reported for July 19, 1922, it was less than that reported at the close of January, 1922, and was only about 46 per cent of the monthly average for 1921. Bills bought in the open market by the several reserve banks increased about 23 per cent from July 19, 1922, to July 18, 1923. In other words, the total volume of bills discounted and bills bought in the open market by the reserve banks increased only from 592 millions to 989 millions from July to July, a very moderate increase in the use of reserve-bank facilities during a period of rapidly expanding business.

During the year the Federal-reserve note circulation increased only about 85 millions; that is, from 2,157 millions in July, 1922, to about 2,242 millions in July, 1923. Likewise, due to the continued influx of gold from abroad, the reserve ratio of the reserve banks was maintained at a high level, being 76.6 per cent on June 30, 1923, as compared with 77.9 per cent on June 30, 1922.

Gold continued to flow in throughout the year under review, but at a greatly diminished rate as compared with the preceding fiscal year, the respective values being about 235 millions and 441 millions. This decline in the inward gold movement is due chiefly to the decline (nearly one billion dollars) in the excess

of exports of merchandise over merchandise imports. It is reasonable to suppose that with this marked reduction in our favorable balance of trade, the inward movement of gold might have practically ceased or might have been converted into one of outflow, had not the volume of foreign securities issued in this country in the fiscal year declined to the lowest level since 1919.

The new foreign capital issues (that is, excluding refunding loans) in the fiscal year ending June 30, 1923, aggregated about 395 millions, as compared with 932 millions in 1921 and 428 millions in 1920. Of the new capital issues in the fiscal year, about 142 millions were for Latin America, about 109 millions for Canada, about 58 millions for Europe, 45 millions for the Far East, and 41 millions for United States possessions.

The general level of the exchanges on New York, as shown by the Federal Reserve Board Index, declined from 69 in the first quarter of the fiscal year to 68 in the second quarter, to 67 in the third quarter, and to 66 in the final quarter. The decline in the general average is primarily a consequence of the unsettled political and economic conditions in Europe. It is to be noted, however, that sterling exchange rose steadily from \$4.45, the average for June, 1922, to about \$4.70, the average for March, 1923, after which time there was a gradual decline, the average for June, 1923, being about \$4.61. On the other hand, the French franc declined from an average of \$0.0876 for June, 1922, to \$0.0630 in June, 1923. The average value of the German mark fell in its headlong decline from about thirty-two one-hundredths of a cent in June, 1922, to about one one-thousandth of a cent one year later.

One of the important events of the year was the funding of the British war debt to the United States Government, the first of the allied debts to be funded under the act of February 9, 1922, creating the World War Foreign Debt Commission. The settlement fixes the capital amount at \$4,600,000,000 as of December 15, 1922, which is equivalent to the amount of the original advances with interest, less a cash payment of slightly over \$4,000,000. Payments on the principal commence with \$23,000,000 the first year and increase to a maximum of \$175,000,000 in the last two years of the 62-year period, with interest on the unpaid balance at 3 per cent per annum to 1932 and at $3\frac{1}{2}$ per cent thereafter.

Foreign Trade.

Both the export and the import trade of the United States during the fiscal year were in an essentially healthy condition, with the improvement begun in the latter part of the preceding

fiscal year continuing in export trade, and with a continuation of the upward trend in the value of imports which had been evident throughout the whole of 1921-22. The year marked a closer balance between merchandise exports and imports, a balance more in keeping with our international position, than any year since 1896.

Compared with the foreign trade of other countries, that of the United States is in a very favorable position. The total gold value of the exports of 10 of the other principal commercial countries of the world in 1922-23 was but 20.6 per cent greater than in the calendar year 1913, while the exports of the United States were 59.3 per cent greater. The import trade of the United States for 1922-23 was 109.9 per cent greater than in 1913, compared with an increase of but 15 per cent for the total of the same 10 countries. The favorable position of our foreign trade is further shown by the fact that trade with the United States is a more important factor in the foreign trade of nearly every important commercial country than it was prior to the war. The value of our exports exceeds that of any other country, while our imports are second only to those of the United Kingdom.

The following table shows the value of our merchandise exports and imports, the balance of trade, the net gold and silver movement, and the total visible balance (merchandise and precious metals) for 1922-23 compared with preceding and pre-war years.

[In millions of dollars.]

Year ended June 30.	Merchandise.		Excess of exports (+) or of imports (-).		
	Exports.	Imports.	Merchandise.	Gold and silver.	Merchandise, gold and silver.
1910-1914 average.....	2,166	1,689	+477	+38	+515
1921.....	6,517	3,654	+2,862	-512	+2,350
1922.....	3,771	2,608	+1,163	-449	+714
1923.....	3,957	3,781	+176	-244	-68

It must always be borne in mind that the great drop from 1921 to 1922 was more largely a drop in prices than in the quantities of goods, as set out in my last annual report.

The increase in the value of 1922-23 trade over the preceding year was 45 per cent for imports and 5 per cent for exports. Compared with pre-war years, the value of imports was 124 per cent and that of exports 83 per cent greater than the 1910-1914 average. The excess of exports over imports in 1922-23 was,

however, but \$176,000,000 compared with over a billion dollars for 1921-22, and an average of nearly one-half billion dollars for the five years just before the war. Taking both merchandise and precious metals together, there was a slight excess of imports in 1922-23—\$68,000,000 compared with an excess of exports in 1921-22 of \$714,000,000.

The "invisible exchange" has a most important bearing upon the whole question of trade balances and is discussed more fully in Part III of this report.

One of the outstanding features of our 1922-23 foreign trade was the continued growth, during the first nine months of the year, in both the value and volume of imports—a growth that brought the value of imports in March, 1923, to a point \$57,000,000 in excess of exports, the first excess of imports in any month since July, 1914. Imports in April and May though lower than in March were still above exports, but since May the decline in imports has been more marked and the first months of the new fiscal year show an excess of exports again.

While each of the great commodity groups contributed to this growth in imports, approximately 75 per cent of the gain in 1922-23 over 1921-22 was due to the increasing requirements of our manufacturing industries for tropical and other raw materials and partly manufactured goods growing out of our increasing industrial activity. These increased imports were largely noncompetitive in character such as raw silk, crude rubber, fibers, furs, skins, and other tropical and semi-tropical products. Though Asia, South America, and Africa, the continents largely supplying this material, showed the greatest percentage increases, imports from both Europe and North America were markedly larger than in 1921-22.

Exports of crude materials, partly manufactured goods, and manufactures ready for consumption in 1922-23 showed substantial gains over the previous year but decreases in foodstuff exports—especially marked in the case of crude foodstuffs—approximately offset the gains in the first two groups, and the net gain in exports over 1921-22 was much more moderate than the gain in import trade. Although exports of crude foodstuffs in 1922-23 showed a marked falling off compared with the preceding year, the value of this group was higher relative to pre-war values than that of any other group, reflecting through the lower relative prices of farm products an even greater gain in quantity. Increased demands for imported foodstuffs on the part of Europe growing out of the curtailment of production in Eastern Europe was responsible for this growth in food exports

as compared with pre-war. Concomitant with the recovery of agricultural production in Europe, a decrease in our agricultural exports is, as was to be expected, occurring. That total exports to Europe in 1922-23 were about the same in value as in the previous year would indicate that exports of manufactured goods and raw material to Europe are increasing as foodstuffs exports decrease. Exports to Asia were slightly below those of 1921-22, while shipments to the Americas and Oceania showed considerable increases.

A study of the influence of prices on values of the principal classes of commodities for which quantitative data are available (presented in Tables 4 and 5) indicates that higher prices in 1922-23 than in 1921-22 were partly responsible for increases in the year's trade values. With 1922-23 trade valued at 1921-22 prices, imports would still show a considerable gain while exports would probably show a slight falling off compared with the preceding year.

The huge export balances of the past few years were a war abnormality, and were to be expected to disappear. Through these balances, however, we have shifted from a debtor to a creditor Nation, and the theory is now more or less generally accepted that our hitherto normal excess of exports over imports must ultimately shift to an excess of imports, as we have large balances to receive in payment of interest. The gradual reduction of the monthly export excess in 1922, culminating in the spring of 1923 in four consecutive months in which imports were larger than exports, does not necessarily mean that this time has arrived. In comparing recent trends of exports and imports it should be borne in mind that the extremely low imports of the 1921 period of depression probably left stocks of many items abnormally low, and the strong upward import trend since reflects both a building up of larger stocks and increased current requirements. On the other hand, rising prices in the United States and gradual recovery of production in Europe have been impairing the competitive power of the American exporter, while the healthy domestic demand for goods has made the American business man to some extent less keen for foreign markets. Furthermore, exports are normally at a lower level during the first half of a calendar year than in the fall months when the outward movement of grain and cotton is the heaviest, and the January to June, 1923, decline from the high figures of the previous October and November is not by any means an indication of a weakening export position. June, the last month of the fiscal year, witnessed an approximate balance between exports and imports and the

first three months of the new fiscal year 1923-24 show both a further falling off in imports and a gain in exports.

TABLE 1.—INDEXES OF MANUFACTURING AND MINERAL PRODUCTION AND OF VOLUME OF TRANSPORTATION.

	Average month, fiscal year—		Month of July—		
	1921-22	1922-23	1921	1922	1923
<i>Index numbers, 1919=100.</i>					
Manufacturing.....	88	108	74	98	105
Minerals.....	91	118	92	83	148
Forest products.....	98	117	87	116	124
Electric power.....	112	136	101	119	140
Building (contracts let).....	92	107	68	111	85
<i>Index numbers, 1913=100.</i>					
Pig iron.....	62	116	34	94	144
Copper.....	42	107	17	92	123
Bituminous coal.....	84	103	78	143	113
Crude petroleum.....	202	250	195	225	315
Cotton (consumption).....	101	116	85	95	96
Pork.....	118	146	110	117	146
Ton miles of railroads.....	107	131	104	199	141

¹ Coal strike in progress.

TABLE 2.—PRICES OF FARM PRODUCTS.

[Index numbers, 1913=100.]

	Average for fiscal year—			Month of July—		
	1920-21	1921-22	1922-23	1921	1922	1923
Wholesale price averages:						
Farm products.....	160	126	139	119	135	135
All other products.....	198	154	167	154	168	160
Farm price averages:						
Crops.....	158	108	125	107	118	136
Livestock.....	137	106	108	109	119	102
Wholesale prices of individual products:						
Wheat No. 1, northern spring...	214	145	132	150	142	111
Wheat No. 2, red winter.....	203	128	125	125	117	103
Corn.....	142	88	116	98	103	137
Cattle.....	138	101	117	99	114	125
Hogs.....	135	107	100	116	121	89
Butter (1919=100).....	83	68	76	66	62	70
Cotton.....	159	142	203	97	175	225

TABLE 3.—GENERAL MOVEMENT OF PRICES.

[Index numbers, 1913=100.]

	Average for fiscal year—			Month of July—		
	1920-21	1921-22	1922-23	1921	1922	1923
Wholesale prices:						
General average.....	184	142	156	141	155	151
Farm products.....	160	126	139	119	135	135
Food, etc.....	177	139	142	141	142	141
Cloths and clothing.....	219	176	193	172	180	193
Fuel and lighting.....	241	196	220	186	254	183
Metal and metal products.....	165	115	138	124	121	145
Building materials.....	207	159	188	160	170	190
Chemicals and drugs.....	168	126	129	129	121	128
House-furnishing goods.....	239	178	181	180	173	187
Miscellaneous.....	163	118	122	123	114	121
Retail food prices.....	177	146	143	148	142	147

TABLE 4.—EXPORTS OF PRINCIPAL ARTICLES FOR WHICH QUANTITY DATA ARE AVAILABLE, 1910-14 AVERAGE, 1921-22, AND 1922-23, SHOWING INFLUENCE OF PRICE ON TOTAL VALUE.

	1910-14 average.	1921-22	1922-23	Value at 1910-14 prices.		Per cent increase (+) or decrease (-) at 1910-14 prices.		Value of 1922-23 quantities at 1921-22 prices.
				1921-22	1922-23	1910-14 to 1923	1922 to 1923	
Grains and flour:								
1,000 pounds.....	6,554,516	29,523,089	22,414,309					
1,000 dollars.....	143,451	581,856	445,012	649,508	403,126	+243.7	-24.1	441,562
Meats:								
1,000 pounds.....	1,321,454	2,179,087	2,256,654					
1,000 dollars.....	147,026	289,466	304,254	239,700	248,232	+63.0	+3.5	297,878
Iron and steel:								
1,000 tons.....	2,164	1,663	1,626					
1,000 dollars.....	84,048	114,187	117,226	64,616	63,175	-23.2	-2.3	111,641
Sugar:								
1,000 pounds.....	70,988	2,002,039	749,855					
1,000 dollars.....	2,969	77,495	41,003	83,685	31,344	+2,718.6	-62.6	28,494
Tobacco, leaf:								
1,000 pounds.....	388,284	451,888	229,472					
1,000 dollars.....	44,686	156,773	77,846	54,227	27,537	+21.3	-49.3	79,397
Cotton, raw:								
1,000 bales.....	8,532	6,542	5,066					
1,000 dollars.....	551,890	596,379	658,983	423,257	327,757	-23.4	-22.7	461,817
Cotton cloth:								
1,000 square yards ¹	298,574	613,053	541,156					
1,000 dollars.....	27,052	76,934	86,517	55,175	48,740	-103.9	-12.7	67,645
Lumber:								
1,000 feet.....	2,221,261	1,542,690	1,554,071					
1,000 dollars.....	50,686	52,674	68,651	35,173	35,434	-30.7	+1	52,838

¹ Stated in yards prior to January, 1922.

TABLE 4.—EXPORTS OF PRINCIPAL ARTICLES FOR WHICH QUANTITY DATA ARE AVAILABLE, ETC.—Continued.

	1910-14 average.	1921-22	1922-23	Value at 1910-14 prices.		Per cent in- crease (+) or decrease (-) at 1910-14 prices.		Value of 1922-23 quantities at 1921-22 prices.
				1921-22	1922-23	1910-14 to 1923	1922 to 1923	
Coal, bituminous:								
1,000 tons.....	13,750	13,036	15,954					
1,000 dollars.....	34,455	67,915	97,523	32,950	39,885	-5.4	+22.0	82,961
Mineral oil, refined:								
1,000 gallons.....	1,553,330	2,421,380	2,821,437					
1,000 dollars.....	110,514	304,249	324,482	169,497	197,006	+53.3	+16.2	352,680
Copper, refined:								
1,000 pounds ²	802,472	677,487	630,734					
1,000 dollars.....	124,402	89,257	94,892	101,628	94,610	-18.4	-7.0	82,626
Oil cake and meal:								
1,000 pounds.....	1,688,021	1,099,245	1,040,024					
1,000 dollars.....	23,645	22,771	22,719	15,889	14,560	-38.5	-5.4	20,800
Total (1,000 dol- lars).....	1,344,824	2,429,956	2,339,108	1,924,800	1,621,406	+20.6	-15.8	2,080,339

² Average for copper is average of years 1912-13 and 1913-14.

TABLE 5.—IMPORTS OF PRINCIPAL ARTICLES FOR WHICH QUANTITY DATA ARE AVAILABLE, 1910-14 AVERAGE, 1921-22, AND 1922-23, SHOWING INFLUENCE OF PRICE ON TOTAL VALUE.

	1910-14 average.	1921-22	1922-23	Value at 1910-14 prices.		Per cent of in- crease (+) or decrease (-) at 1910-14 prices.		Value of 1922-23 quantities at 1921-22 prices.
				1921-22	1922-23	1910-14 to 1923	1922 to 1923	
Sugar:								
1,000 pounds.....	4,341,058	8,464,329	8,422,483					
1,000 dollars.....	103,507	200,774	365,101	194,679	193,727	+87.1	-0.5	199,607
Rubber, crude:								
1,000 pounds.....	105,736	568,381	797,655					
1,000 dollars.....	86,345	86,751	169,108	466,073	654,077	+657.5	+40.3	119,648
Coffee:								
1,000 pounds.....	899,339	1,238,012	1,305,188					
1,000 dollars.....	101,455	148,503	181,639	136,181	143,571	+41.5	+5.0	156,623
Hides and skins:								
1,000 pounds.....	531,636	392,904	682,886					
1,000 dollars.....	104,582	78,899	140,392	78,581	136,577	+30.5	+73.8	136,577
Silk, raw:								
1,000 pounds.....	23,779	48,179	52,684					
1,000 dollars.....	77,058	300,445	405,796	156,100	160,695	+108.5	+2.0	328,746

TABLE 5.—IMPORTS OF PRINCIPAL ARTICLES FOR WHICH QUANTITY DATA ARE AVAILABLE, ETC.—Continued.

	1910-14 average.	1921-22	1922-23	Value at 1910-14 prices.		Per cent in- crease (+) or decrease (-) at 1910-14 prices.		Value of 1922-23 quantities at 1921-22 prices.
				1921-22	1922-23	1910-14 to 1923	1922 to 1923	
Paper, newsprint:								
1,000 pounds.....	238,212	1,857,025	2,381,833					
1,000 dollars.....	4,804	71,466	86,974	37,141	47,637	+891.6	+28.2	90,510
Tobacco, leaf:								
1,000 pounds.....	54,699	67,225	75,783					
1,000 dollars.....	31,690	57,049	69,225	38,981	43,954	+38.7	+12.8	64,264
Wool:								
1,000 pounds.....	207,585	255,087	525,473					
1,000 dollars.....	39,259	45,649	162,095	47,571	113,979	+190.3	+155.7	110,839
Burlap:								
1,000 pounds.....	293,383	489,629	570,654					
1,000 dollars.....	29,421	40,949	65,292	49,863	57,065	+93.9	+14.4	46,794
Cotton, raw:								
1,000 pounds.....	110,957	179,165	236,092					
1,000 dollars.....	20,651	43,958	60,640	33,325	43,913	+112.6	+31.7	57,843
Tea:								
1,000 pounds.....	95,126	86,142	96,669					
1,000 dollars.....	16,732	18,040	26,308	15,161	17,014	+2.0	+11.0	20,204
Wood pulp:								
1,000 tons.....	472	902	1,294					
1,000 dollars.....	14,631	49,608	74,191	27,453	39,392	+169.2	+43.4	71,184
Tin for blocks, pigs:								
1,000 pounds.....	106,134	100,429	151,941					
1,000 dollars.....	41,511	28,980	53,400	39,167	59,257	+42.7	+51.2	43,911
Copper, crude, refined, and scrap:								
1,000 pounds.....	276,065	274,182	527,695					
1,000 dollars.....	37,016	33,016	73,596	35,644	48,600	+31.3	+36.4	63,323
Total above items:								
1,000 pounds.....	8,340,532	16,041,067	18,726,712					
1,000 dollars.....	708,662	1,204,087	1,933,757	1,355,920	1,759,458	+148.2	+29.7	1,510,073

Part II.—ADMINISTRATIVE WORK OF THE DEPARTMENT.

For the detailed administrative work of the various bureaus, I especially commend the statements of the bureau heads, contained in Part V of this report, as showing great progress in fact and in zeal during the fiscal year.

Aside from the routine work, a number of the special and more important services undertaken during the fiscal year are particularly referred to below.

Foreign-Trade Promotion.

The year under review has been one of marked expansion in the activities of the department in promotion of American trade abroad. The Director of the Bureau of Foreign and Domestic Commerce informs me that during the fiscal year the services of the bureau have been called upon in actual transactions of export business totaling more than 400 millions of dollars. Some conception of the volume of service called for is indicated in the fact that the number of specific inquiries and requests for assistance in foreign-trade matters received by the department are now averaging in excess of 3,000 per day, or approximately four times the average number received at the time the reorganization of this service began.

In addition to the vast amount of regular work carried on by the bureau, special surveys have been made during the fiscal year, in cooperation with special committees of the various trades, of markets in all parts of the world for American export commodities.

At a time when the economic position of the farmer has been such as to render the agricultural problem in all its phases a matter of deep concern to the Administration, the department has been enabled, through the reorganization of its foreign service and directing staff in Washington, to render especial service in the promotion of export trade in agricultural products.

In the regular course of its work it has maintained a specialist in food marketing in Europe, which takes 80 per cent of our agricultural shipments, reporting constantly by cable upon food requirements in the various countries. Particularly in

connection with the marketing of products of cooperative associations, the department has been able to render a great deal of assistance.

World Surveys in Agricultural Products.

One result of conferences held with committees representing farmers' associations, farm cooperatives, and exporters was a request by them that the department undertake to make world surveys of certain of the principal agricultural products, which would enable them more accurately to estimate the world situation as to production, stocks, and consumption in these commodities from time to time. Such surveys have been started with cotton, wool, sugar, and rice; while frequent surveys of grain, potatoes, and other commodities are made by the department's representatives in Europe (which is the principal foreign market for these products), and transmitted to the department by cable for distribution to producers, exporters, and the interested public in this country.

The world surveys on cotton, wool, sugar, and rice have been issued periodically and have given in brief summarized form the facts as to estimated world production, estimated world consumption, and world stocks on hand. It is obviously not a proper function for the department to attempt to interpret these statistical tabulations, or to forecast future probable world production or consumption. The purpose of the surveys is solely to have an independent source give a purely fact analysis of the world situation in these commodities at a given time. The value of such facts to producers and exporters is indicated by the increasing demands for the permanent continuance of the surveys.

Foreign-Trade Statistics.

The transfer of the Bureau of Customs Statistics from the Treasury to the Commerce Department on January 1, 1923, and its subsequent reorganization, have effected a great improvement in the service of foreign-trade statistics to the commercial public. As a result of the increased equipment and personnel provided from the deficiency appropriation, the issue date of the reports has been advanced about two weeks, and since May the import reports have been completed simultaneously with those for exports.

The preliminary totals are now completed by the 13th of each month, the reports by articles and countries by the 20th, and copy for the import and export statements in the Monthly Summary is now ready for the printer by the 24th.

Special monthly statements have been inaugurated showing details by countries for some of the principal articles in the im-

port and export trade, including meats, fats, grain, hides, leather, iron, steel, copper, other metals and metal products, cotton, silk, wool, electrical and other machinery, automobiles, canned goods, rubber manufactures, coal and petroleum, chemicals, typewriters, sewing machines and other specialties, motion-picture films, etc. These special statements are furnished regularly to a list of more than 12,000 of the commercial public who have found the information necessary to the conduct of their business.

Simplification and Standardization.

The work of the department in the various phases of elimination of industrial waste carried on in full cooperation with the various trades has developed in many directions during the fiscal year, and the progress made has been eminently satisfactory.

At the beginning of the present Administration the department had instituted a review of Federal purchasing specifications, in cooperation with committees from the various industries, with a view to a better formulation of standards simplifications and more accurate presentation of specifications in Federal purchases. Upon the establishment of the Bureau of the Budget a Federal Specifications Board was created under the budgetary powers, members of this department acting as chairman and secretary. The Federal Specifications Board has had under review Federal specifications, and in their formulation has not only made the necessary scientific investigations but has called into consultation representatives of the manufacturing industries concerned, in order that Government purchases should be properly adapted to the manufacturing processes and normal stocks and materials of the country. A very considerable amount of economy has thus been effected in the purchase of Federal Government supplies.

With a view to further assisting in the elimination of national waste along this line, a conference of the various State purchasing agents met at the department during the fiscal year under review. The result of this conference was a unanimous expression of desire to cooperate in the unification of specifications being used by State and municipal agencies, and to this end the conference requested all possible assistance from the Federal Government. There followed a more general conference on June 11, 1923, for the purpose of considering the unification of purchase specifications from the point of view of both the producer and the consumer. At this second conference was organized an advisory

board to cooperate with the Department of Commerce and the National Conference of Governmental Purchasing Agents in the preparation of a dictionary or handbook of specifications. This board, which is now working actively in preparation of Federal specifications for general use in local government and institutional buying, consists of official representatives of organizations speaking for the State and municipal institutions; the producers and consumers of such commodities as are purchased for governmental consumption; and the standardization bodies having national recognition.

As a specific example of the working out of standards in cooperation with the industries may be mentioned the conference on builders' hardware. Thirty-five manufacturers, representing approximately 90 per cent of production in this field, are actively cooperating in this work. During the fiscal year 10 meetings were held, covering about 60 per cent of all the items in the various phases of this industry, and the resulting recommendations are already being put into effect.

Another illustration is the Committee on Specifications for Window and Plate Glass, composed of representatives from the American Institute of Architects, National Glass Distributors Association, Plate Glass Manufacturers, Sash and Door Association, wire-glass manufacturers, window-glass manufacturers, and the United States Government. The result of the meeting of this committee, held on December 19, 1922, was the adoption of specifications for quality and sizes of plate and window glass, including definitions.

As a part of the extended activity of the department in connection with the elimination of national waste there is in progress in cooperation with the American Petroleum Institute, the Society of Automotive Engineers, and the National Automobile Chamber of Commerce a series of investigations relating to the conservation of motor fuels. Much of the technical research was accomplished during the fiscal year, and the program is progressing in a most satisfactory manner. Its completion should bring great savings to consumers of motor fuels and constructive conservation of one of our vital natural resources.

The erection in the department, as recorded in my last annual report, of a new Division of Simplified Practice, has been amply justified by the extent to which different industrial groups have availed themselves of its technical and advisory services during the fiscal year. During this period 54 conferences have been held by different trade committees, at their request, with the depart-

mental experts engaged in this work. The total number of industrial groups now using this service of the department in developing definite steps toward simplification in their activities is 125, representing 90 different fields of production and distribution. In the study and investigation which precedes recommendations for simplification in any product the manufacturers, distributors, and consumers of the product necessarily play an equal part. Such action is, of course, wholly voluntary, and in each case cooperation and agreement by the various factors precedes the adoption of simplified practice recommendations. It follows that in the large majority of cases the simplification proceedings are still in the process of development. Eight definite recommendations, however, have been consummated during the period under review.

The following examples may be cited as showing the nature of accomplished work in this field:

A conference held at the department on March 6, 1923, between representatives of the International Milk Dealers Association, The Glass Container Association, The Cap Manufacturers Credit Association, and the National Association of Bottle Manufacturers unanimously recommended 3 sizes of milk bottles for quarts, pints, and half pints, with one size opening for the entire group. Before this constructive step milk bottles were manufactured in 12 sizes for quarts, 13 sizes for pints, 14 sizes for half pints, 10 sizes for quarter pints, and approximately 10 sizes of caps. The entire industry has accepted the findings of the conference.

On March 27, 1923, paving brick, which had been reduced from 77 to 7 types and sizes at previous conferences, was further reduced to a total of 6 sizes.

A general conference of manufacturers, distributors, and users of asphalt at the department on May 28, 1923, reduced the grades of asphalt from 88 to 9 varieties. At another conference on the same day the sizes and varieties of hotel and institutional chinaware were reduced from 700 to 160. At a general meeting of the industries concerned, held in the department on June 21, 1923, the sizes and varieties of common brick and face brick were reduced from a total of 73 to 1 recognized variety of each type.

The annual value to industry and savings to the general public which such simplifications assure, while difficult to accurately estimate, run in the aggregate into many millions of dollars, and their importance in the maintenance of our high standards of living need not be emphasized.

Housing and Construction.

In connection with the disturbed housing conditions resulting from suspended construction during the war, I referred in my last annual report to a new division created in this department to assist and cooperate with voluntary bodies engaged in developing home ownership. The department, through this division, has during the fiscal year given active aid to a movement sponsoring demonstration houses that have been equipped and opened to the public in several hundred cities, usually by women's organizations in cooperation with business and civic groups. The result has been to encourage wiser expenditure for household purposes. Associated in the Better Homes movement, which you have headed, are eight Federal Government officials, including two from the Department of Commerce, and representatives of the principal national organizations of women's clubs, business men, architects, and bodies interested in child welfare and public health.

Valuable educational work has also been carried on by the small house service bureaus, which have been encouraged by this department, in providing at cost small-house plans designed by competent architects.

At the request of many organizations interested in housing, a handbook for prospective home owners was prepared in the department during the year. Its value to the general public is well indicated by the fact that its sales by the Superintendent of Documents immediately ran into the hundreds of thousands.

During the period under review, the construction industry has been confronted with the problem of meeting the extraordinary demand for construction resulting from the suspension during the war and the postwar slump, without hurtful inflation of building costs. In March of this year the situation was such that, in response to an inquiry from the late President, I recommended that all but the most essential Government works and public buildings should be deferred for the time being, so as to give way to much needed private construction. Hundreds of manufacturers, labor organizations, contractors, and the public have concurred in this recommendation.

Increased interest has centered during the year on statistics of activity, production of building materials, and the building cost indexes that the department has been distributing, but the inadequacy of the data available has been evident. The department has been unable, on account of lack of funds, to meet the demands on it for information that have come from many of the most important business groups.

The need for elimination of waste in construction has been recognized by practically every group concerned, and the members of the department's staff, and its funds, have been pressed to the limit by requests for cooperation in work on building codes, plumbing codes, simplification and elimination of dimensional varieties of building materials, research on the use of building materials, and studies of zoning and city planning problems.

Commercial Statistics.

At the request of the various industries the department has during the fiscal year materially improved and extended its service in commercial statistics. The statistics included in the Survey of Current Business now cover all of the basic industries and consist of monthly reports on production and stocks, in addition to the annual and semiannual statistics which are published, giving data in detail for certain industries. The department has been able during the year to make these statistics available to the public in more current form by issuing to the daily and trade press every two weeks in mimeograph form the latest statistics that have been received. They are later coordinated in the monthly issues of the Survey. It is only through the active cooperation of the industries themselves that adequate current statistical information can be recruited, and the development of this service has, therefore, been due primarily to the business man's appreciation of his own need for current information on the business trends of the Nation.

Coal.

The beginning of the fiscal year under review found the Nation in the midst of its largest and most far-reaching coal strike. The measures taken by the department to secure adequate stocks of coal throughout the country before the beginning of the strike on April 1, 1922, brought about the accumulation of some 75,000,000 to 80,000,000 tons, the largest stock in our history. The result was that the commerce and industry of the country were sustained during the prolonged strike of five months.

After the strike the accumulated demands and lack of transportation made it necessary to organize distribution in order to secure consumers against local shortages and restrain extortionate prices. An organization of Lake shippers and State coal administrators in the Northwest States was created with headquarters at Minneapolis and Cleveland to facilitate shipments across the Lakes in provision for the winter.

Upon the recommendation of this department, the President on August 18, 1922, addressed Congress asking for legislation to enable the Federal Government to cooperate in a more practical and effective way with the States to control distribution and prices. The prospect of relief in itself created an effective buying strike, and prices greatly receded.

On September 22 the coal legislation was enacted by Congress, creating the office of Fuel Distributor, and conferring some measure of authority upon the Interstate Commerce Commission in restraint of unreasonable prices in interstate trade. It was impossible constitutionally to extend Federal control to the prosecution of profiteering or the control of speculation in coal produced and distributed within State boundaries, or upon re-sales of coal imported into a State. The responsibility for such action rested upon the State authorities, and in some cases was effectually cared for.

Upon my recommendation Mr. Conrad E. Spens, vice president of the Chicago, Burlington & Quincy Railroad, was appointed Federal Fuel Distributor, and continued in office until the crisis was passed some four months later.

The results of these activities may be summed up in the fact that the price of spot bituminous coal at the mines during the entire period from April 1, 1922, to January 1, 1923, averaged \$4.13 as against \$6.66 in the same months of 1920, when very much less of an actual shortage existed.

Radio.

In March of this year the second National Radio Conference was held at this department. The principal commercial, public, scientific, and Government organizations interested in broadcasting were represented. The purpose of the conference was to endeavor to work out proposals for administrative action which might in some degree reduce the great amount of interference then existing, in the absence of enactment by Congress of the new legislation to cope with the situation recommended by the first conference held at the department during the previous fiscal year. The result was a recommendation for a reallocation of frequencies among the broadcasting stations, a band from 1,350 to 550 kilocycles (wave lengths 222 to 545 meters) being suggested for that service, and for new allocations for amateur, exclusive Government, exclusive commercial, and marine telephone use.

The recommendations were adopted by the department practically in their entirety, and have been put into operation with the result that interference has been greatly reduced.

The Interdepartment Advisory Committee on governmental radio broadcasting, which was an outgrowth of the First National Radio Conference, and the chairman of which is an official of this department, has during the year extended its scope to include questions pertaining to Government radio communication in general, and is now known as the Interdepartment Radio Advisory Committee. It is performing an important function as a coordinating agency and advisory body to all of the participating Government departments and establishments in their use of radio communication, and particularly to this department in its administration of radio law.

Facilities for the enforcement of the present law are wholly inadequate. There are some 25,000 stations now sending radio messages within our country or along our coasts. The law requires the inspection of all these stations, and if this inspection is to be sufficiently efficient to accomplish results in the character of equipment and prevention of interference it must be performed with reasonable frequency. To inspect these 25,000 stations the department now has a total force of 29 men, all that can be employed within the limit of the appropriation. Manifestly, under such a condition, effective inspection is impossible.

Mention is made in Part IV of this report of the need for new legislation suited to the tremendous growth in the radio art.

Fisheries.

As was anticipated, very satisfactory results have been apparent during this the first year in the operation of the fisheries reservations already established in Alaskan waters. Effective control of the situation has become possible, and a furtherance of the principle and practice will result not only in continuing the salmon fisheries in perpetuity but also in their rehabilitation and development upon a scale heretofore attained only in the peak years.

In administering the reservations the policy has been adopted of imposing definite restrictions upon the number of operators, fishing methods, the maximum amount of apparatus to be used, length of season, and maximum pack. Due consideration has been given the resources of each district, the fisheries concerned, fishermen already established, previous output, and the economic operation of the plants.

These general principles have been kept in view at all times in the preparation of regulations and the issuance of permits. In a district which could not safely support further expansion of the salmon fishery, new plants and additional fishermen

have not been permitted. If fishing operations were already conducted upon too extensive a scale, restrictions have been imposed that bear with equal weight on all concerned. The department has issued to each packer, large or small, fisherman, fox farmer, or native of Alaska already operating within the reservation, permits to continue fishery operations under certain prescribed conditions. Permits for the more extensive operations have been issued in Washington; but in the case of many local operators, agents of the department on the ground and able to judge of conditions have been authorized to act. These agents, who travel throughout the Territory, have been able to handle cases in inaccessible districts with infrequent mail service, and thus to carry out the department's desire to perform its duties with as little inconvenience as possible to the persons with whom it must deal.

A recommendation of legislative action to prevent further depletion of the fisheries is contained in Part IV of this report.

Russian Relief.

The relief work in Russia of the American Relief Administration, of which I am chairman, has been completed. This work, which was undertaken with the approval of President Harding and in cooperation with this department, was supported by congressional appropriations amounting to \$24,000,000 and by funds from charitable and other sources of over \$45,000,000. Although the famine was broken in the summer of 1922, when the American program reached its peak, relief on a reduced scale was continued into the summer of 1923 to meet the after-famine problems of destitute children and disease.

In the course of the 23 months of operations, several billion rations were distributed through more than 28,000 feeding points established in 20,000 towns and villages, which were scattered over an area of about 1,000,000 square miles. At the period of most intense famine over 11,000,000 people were fed. Through the food and clothing package delivery system and through the medical relief work, which were not confined to famine areas, American relief penetrated every section of European Russia. Over a million and a quarter ten-dollar food packages and over 41,000 twenty-dollar clothing packages (purchased from the American Relief Administration by persons in America and in other countries for the benefit of relatives in Russia) were delivered in the course of the relief operations. Medical relief was afforded to 15,000 institutions serving an area with a population of 80,000,000. Other areas with a population of 25,000,000

were supplied from sanitary trains. All these varied operations were carried on wholly under the direction of Americans, who at the high point numbered about 200. Internal transportation in Russia and other internal expenses, including payment of the Russian staff, were met by the Soviet Government. All overhead expenses were covered by the margin earned from the food package operation, which also yielded a substantial sum for general relief. The relief organization, furthermore, was instrumental in establishing the citizenship and effecting the repatriation of nearly 600 Americans in Russia who desired to return to this country.

All contracts and agreements between the American Relief Administration and the Soviet Government were liquidated on June 15, 1923, when all claims and accounts arising from the activities of the American Relief Administration in Russia were settled. This great and practical demonstration of the friendship of America for the people of Russia did much more than defeat the greatest famine in the history of that country. The magnitude of the American relief program, the opportunities for public service which that program offered, the demands which it made on Russian official departments and services, created an impetus to productivity where stagnation existed. The timely aid from a far country gave new courage to a shaken people.

Colorado River Commission.

The Colorado River Commission, on which I represented the Federal Government under appointment by President Harding and acted as chairman, held its final sessions at Santa Fe, N. Mex., from November 9 to November 24, 1922. On the latter date the Colorado River Compact was signed by the representatives of the seven States (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming) and approved by me as the representative of the Federal Government.

The major purposes of the compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River; to establish the relative importance of different beneficial uses of water; to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods. To these ends the Colorado River Basin is divided into two basins, and an apportionment of the use of part of the water of the river is made

to each of them with the provision that further equitable apportionments may be made.

The compact provides a basis for the carrying out of one of the greatest of our national developments. The land under irrigation in 1920 from the river and its tributaries amounted to about 2,464,000 acres in the United States. It is estimated that the irrigated land can be increased to over 5,000,000 acres. Development of 5 million horsepower is a possibility. With long-distance transmission all of this can probably be brought into national use. One of the largest problems is the constant threat of the lower river to break through its banks and to flood the Imperial Valley, destroying prosperous communities with property values of many millions of dollars. Such a break occurred a few years ago and several million dollars were expended before the river was restored to its normal channel.

The successful negotiation of an interstate compact in settlement of so important and complex a problem is significant in that it marks the first time that so large a number of States have been able to settle fundamental interstate rights by process of treaty. The compact becomes effective when approved by the legislatures of each of the signatory States and by the Congress of the United States. The legislatures of six of the seven States have now ratified it, only Arizona having failed to take final action. Congressional action will doubtless await the approval of all of the seven States.

Conferences with Commerce and Industry.

In connection with the services outlined above, and many others, a total of 335 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 48 were on matters of transportation and fuel distribution; 101 on questions of foreign trade; 93 on specifications, standardization, and simplification; 17 on housing and construction; 24 on statistical questions; 7 on merchant marine and fisheries; and 45 on various general and special problems.

Part III.—INVESTIGATIONS INTO VARIOUS ECONOMIC PROBLEMS IN PURSUANCE OF THE ORGANIC ACT.

Under the provisions of the organic act the department has from time to time made investigation and study of various important economic problems confronting the country. The reorganization of the departmental staff and the cooperation of the business community in advancing information have contributed to make the undertaking of such investigations possible.

Railway Consolidation.

The past year's experience of the department in its relations to transportation has shown even more emphatically than ever before the necessity for the consolidation of the railways into larger systems under private ownership, the principles of which were established in the transportation act of 1920. The difficulties of reorganizing the rate structure so as to secure simplification and to give relief in primary products—agricultural, coal, etc.—by a fairer burden upon finished and LCL goods are almost insuperable until the different systems are possessed of more diversified traffic and until the weaker roads have been absorbed. The necessity to establish railway credit and finance on a broader foundation than sole reliance upon the issue of mortgage securities; the necessity of provision for common utilization of terminal and other facilities; the impossibility of providing adequate rolling stock and particularly specialized cars so long as the burden falls solely upon the strong roads; the difficulties of more definite control of car service to meet seasonal demands and routing; the insuperable problems of equalization in car interchange; the slow progress in standardization and maintenance of equipment—all point to the imminent desirability of early progress with consolidations, if we are to have a transportation system adequate to the necessities of the country and containing in itself the strength for annual increase.

The policy of control of rates is fixed by National and State legislation. This policy has superseded the theory that reasonable rates are to be obtained through competitive action. The

idea of protection against excessive rates through the maintenance of competition is now dead. We should therefore secure the largest possible benefits from consolidation into larger systems by securing consolidation in such fashion as will protect and advance public interest.

The urgent importance of the early consummation of consolidation warrants consideration of methods to expedite it. Under the present provisions for wholly voluntary action subject to the Interstate Commerce Commission, many consolidations are likely to be long delayed. The difficulties of negotiation between the members of the groups that will be established by the Interstate Commerce Commission; the complications arising from varying priorities of securities affecting the determination of terms of purchase by one railway line of the property of another; the unwillingness of some lines to acquire or to sell others; the questions of individuality; the difficulties of establishing by negotiation the relative value of one property to another; the necessity of holding capitalization within the limits of the actual property values; the complexities and conflicts of State regulation and laws—all these problems would find a great measure of solution if the consolidated systems were allowed Federal incorporation and if after a lapse of some appropriate period for voluntary action the Interstate Commerce Commission were given authority to create definite organization committees for each system including representation from the public and from the component roads. It should be the duty of such committees to develop and perfect a plan of consolidation either through the exchange of securities of the consolidated systems directly with the security holders of the component roads or by some other method. I believe that under such auspices the security holders would be willing voluntarily to make such an exchange. If a minority should refuse, it would be entirely feasible to invoke condemnation and purchase of their securities for the consolidated systems at an established fair value. Such a method would permit the determination of the relative value of the different railways considering both the physical properties and the often lower total of their securities, and due account could be taken of future as well as present conditions.

The ownership of some roads or terminals jointly by two or more consolidated systems could be provided for, as there are cases where such a solution would be most advisable in creating more efficient transportation. The public interest could be safeguarded by limiting the total capitalization of consolidated systems to an amount not exceeding the physical value of the rail-

ways as determined by the Interstate Commerce Commission under the transportation act as of June 30, 1914, plus actual capital expenditures and deducting abandonments and depreciation since that date. The total capitalization of many of the consolidated railways would probably be less than the Interstate Commerce Commission physical valuation and certainly less than their present nominal capital. An approach to the problem through such organization committees is in accord with common business practice, and if it were made possible it should result in greatly expediting consolidations and in their perfection on terms soundly protective of public interest and with an equitable adjustment of relative values between the component roads.

Invisible Items in International Trade.

The increasing importance of the so-called "invisible" items in American trade has rendered it necessary to have some competent estimate as to their volume. Therefore, the department undertook an exhaustive investigation covering the calendar year 1922.

Our international balance sheet is not made up alone of the values of our imports and exports of merchandise and precious metals, which are capable of determination statistically month by month. For the last two decades the volume of those transactions which, for lack of a better term, are referred to as "invisible" exports and imports, has become of steadily increasing importance.

These items, embracing the movement of capital, and the movement of current items, such as interest, remittances of emigrants, tourist expenditure abroad, ocean freights, and so on, have now come to be of such a volume as to entirely dominate what is known as the "favorable" or "unfavorable" trade balance from merchandising account. For instance, for 1922 there was due us from foreign countries, from the excess of our exports over our imports of merchandise, an amount of \$754,000,000. However, when we take into account such "current invisible" items as the movement of interest, remittances to emigrants, tourist expenditure, ocean freights, etc., we find that our citizens have sent to or spent in foreign countries a net balance on these accounts of about \$425,000,000 more than we received on such accounts, and thus the balance due us is reduced to about \$329,000,000. As affecting this sum we have received about \$246,000,000 net gold and silver imports, and in addition there has been the invisible movement of loans and credits. Thus the net balance on the year's business due to us is reduced to about \$83,000,000. We had, however, large capital

operations during the year. We have exported capital in the shape of purchases of foreign securities, etc., over and above the imports of capital of the same character to the net amount of about \$669,000,000 during the year 1922. The only evident explanation is that this sum (except for \$83,000,000) represents the funding of open obligations previously due to us.

A full comprehension of the invisible items and their approximate value is not only of profound importance in assessing our international balance sheet, but no sound conclusion can be made concerning the effect of foreign trade movements upon our credit structure, or upon the ability of foreign countries to purchase our commodities or to pay their debts, or upon exchange rates, or upon the movement of gold, or the ultimate trend of price levels compared with those of other nations, without some comprehension of our full balance sheet, including the invisible items.

In this undertaking the department has had the full cooperation of the principal banks, merchant houses, shipping companies, statistical services of the Treasury, and other Government agencies. It has had the advantage of the individual judgment of many institutions and prominent men as to the weight to be attached to the data obtained.

From the nature of things these movements can not be recorded statistically, so that the process is necessarily one of estimation. The fact must be emphasized that such items are merely estimates, with a varying degree of accuracy. Many of them are subject to wide variation in judgment, and the result may be in error 150 million dollars either way, although the tendency is for over and under estimates on opposite sides of the balance sheet to neutralize each other.

The following table is a short summary of the results arrived at, broader details of which are given in the full report of the investigation:

ESTIMATED INTERNATIONAL BALANCE OF PAYMENTS, 1922.

[In millions of dollars.]

CURRENT ITEMS.

Inward or credit movements (exports):

Invisible items—

Governmental receipts from foreign nations..... 170

Interest on American capital abroad..... 227

Freight payments receivable on exports..... 71

468

Visible items (goods)—Exports of merchandise..... 3,867

Total..... 4,335

Outward or debit movements (imports) :

Invisible items—

Governmental expenditures abroad.....	29
Interest payable on foreign capital in United States.....	100
Freight payable on imports.....	64
Immigrants' remittances and European relief....	400
American tourists' expenditures.....	300
	893

Visible items (goods)—Imports of merchandise.....	3, 113
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Total.....	4, 006
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Net favorable balance.....	329
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GOLD AND SILVER MOVEMENT.

Visible items (specie) :

Exports of silver.....	63
Exports of gold.....	37
	100
Imports of silver.....	71
Imports of gold.....	275
	346

Net imports (specie).....	246
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CAPITAL MOVEMENT.

Inward capital items:

Foreign loans matured and paid.....	78
Foreign securities resold abroad.....	189
American securities sold abroad.....	61
	328

Outward capital items:

New foreign bond issues in United States (excluding refunding loans).....	637
Foreign securities issued abroad but sold to the United States.....	326
American securities formerly held abroad sold to United States.....	34
	997

Balance.....	669
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A distinction is made above in the "invisible" items for purposes of discussion between "current items" and "capital movement" of somewhat the same character as that made between capital and revenue expenditures and receipts in business operations. The items under the heading "current items" are likely to be more or less constant over long periods, whereas specie and capital movements are likely to fluctuate widely from year to year according to business conditions and the balances of "current items."

It is obvious that there are wide changes in progress in our international balance sheet for the year 1923 as compared with

1922. It is improbable that we shall have any considerable merchandise balance in our favor. There has been a continued movement against us in the current items of "invisible" exchange. There has also been a much smaller movement in the export of capital. There has been a continued import of gold despite this situation. The explanation of the latter possibly lies in the fact that there has been a large export of our currency which is being held and used abroad, and there are some evidences that many countries in Europe have been increasing their open balances in the United States and their investments in American securities, resulting at least partially from "a flight of capital" from the fluctuating currencies abroad to our gold securities.

This subject has become of so much importance in comprehensive understanding of our international trade and financial relations that it is proposed hereafter to make the surveys within the first 60 days after the end of the calendar year and incorporate them as part of the regular statistical service of the department.

Unemployment Due to the Business Cycle.

It was the view of the members of the Unemployment Conference, which was held during the previous fiscal year under my chairmanship, that certain suggestions for controlling extremes of the business cycle so as to lessen the losses due to recurrent periods of unemployment were worthy of serious consideration, and that in any event a thorough study of the business phenomena of booms and slumps would serve to advance public knowledge and stimulate thought toward constructive solution. Accordingly I appointed the following committee to undertake an investigation and report: Owen D. Young, chairman of the board, General Electric Co., Chairman; Joseph H. Defrees, former president of U. S. Chamber of Commerce; Mary Van Kleeck, Russell Sage Foundation; Matthew Woll, vice president, American Federation of Labor; Clarence M. Wooley, president, American Radiator Co.; Edward Eyre Hunt, secretary of the President's Conference on Unemployment, Secretary.

An exhaustive investigation was undertaken with the assistance of appropriations toward its cost from the Carnegie Foundation and with services contributed to the committee by the Department of Commerce, the National Bureau of Economic Research, The Russell Sage Foundation, The Federated American Engineering Societies, the United States Chamber of Commerce, the American Federation of Labor, the American Statisti-

cal Association, the American Economic Association, the Bureau of Railway Economics, and a number of others.

The committee has prepared a constructive report after consideration of the facts and views developed. The report represents a definite advance in economic thought and offers practical constructive suggestions that should make for progress.

Broadly, the business cycle is a constant recurrence of irregularly separated booms and slumps. The general conclusion of the committee is that as the slumps are in the main due to the wastes, extravagance, speculation, inflation, overexpansion, and inefficiency in production developed during the booms, the strategic point of attack, therefore, is the reduction of these evils, mainly through the provision for such current economic information as will show the signs of danger and through its more general understanding and use by producers, distributors, and banks, inducing more constructive and safer policies. Furthermore, the committee has developed some constructive suggestions as to the deferment of public work and construction work of large public-service corporations until periods of depression and unemployment. Such deferment, while in the nature of relief from evils already created, would tend, both by the subtraction of these works from production at the peak of the boom and by their addition to production in the valley of depression, toward the more even progress of business itself.

The report does not suggest panaceas or economic revolution, but seeks to drive home the facts that the enlargement of judgment in individual business men as to the trend of business and the consequent widened vision as to approaching dangers will greatly contribute to stability, and that the necessary information upon which such judgment can be based must be systematically recruited and distributed.

The investigation shows that many firms have pursued such policies and have come through the recent period of business disaster with success and stability, and that ignorance of determinable facts accounts for the disasters to many others.

Two specific recommendations directly affect action by the Government. The first of these is that Government construction should be so regulated that it may be deferred in times of intense private construction and expedited in times of unemployment. The effect would be not only to secure more economical construction for the Government but also to stabilize the construction industries and to considerably mitigate unemployment in periods of depression.

The second recommendation is that the Government's statistical services on production, stocks, and consumption of commodities should be vigorously expanded so as to furnish the basic material from which the commercial public may judge the ebb and flow of economic currents.

The whole problem belongs to a vast category of issues which we must as a Nation confront in the elimination of waste if we are to maintain and increase our high standards of living. No waste is greater than unemployment, no suffering is keener or more freighted with despair than that due to the inability of those who wish to work to get jobs.

The report has created a very large amount of interest and discussion throughout the country. The committee informs me of favorable editorial comment noted in over 800 journals, and favorable discussion amongst economic and commercial bodies is still in progress. The public is indeed indebted to the committee and the large group of its coworkers in the conduct of an investigation resulting in so much constructive thought.

Seasonal Operation in the Construction Industries.

The department undertook toward the close of the fiscal year a survey of seasonal operation in the construction industries, in cooperation with a strong committee from the industry, for the purpose of determining how nearly it is possible to eliminate the dull seasons which are characteristic of construction activities.

Previous surveys indicate that most construction activities are concentrated in 7 to 10 months of the year, and that contractors' organizations and equipment men, architects, engineers, building material producers, and others connected with construction must usually remain idle for similar periods. This idle time represents waste and direct losses to the construction industries, the workers, and the public. The construction industries affect practically all other industries and all classes of our population.

The present survey covers seasonal construction by regions and kinds of structural work, to determine the dates of the beginning and ending of the normal building season for various types of work, such as road building, dwellings, apartments, and business houses.

It also covers seasonal production in building materials, to determine how far this is due to seasonal building operations and trade customs and how far to climatic conditions.

The survey includes an examination of successful devices for lengthening the construction season, in the hope that through

an examination of the facts and proposed remedies it will be possible to suggest sound solutions and obtain general co-operation in carrying them out.

Investigation into Foreign Raw Material Sources.

There are a number of necessary raw materials for the supply of which we are predominantly dependent on imports from foreign countries. Possibly as a result of the war, but more particularly during the past 18 months, there has been a growing tendency for producers of these commodities to combine in control of prices as against the American market. This is particularly the case in nitrates, tanning extracts, quinine, rubber, sisal, tin, cork, mercury, tungsten, and various minor minerals.

The effect of these price combinations in the consequent higher cost to American consumers presents a most serious problem. While we are vigorous in the control of price combinations in respect to our own industries, we are of course powerless to reach these foreign combinations through our antitrust laws.

Under authority of Congress, an exhaustive examination of such combinations was undertaken by the department before the close of the fiscal year to determine—first, the character and extent of the combinations themselves; second, whether alternative sources for these raw materials can be stimulated and therefore natural competition induced; third, what relief can be obtained by stimulation of synthetic or substitute materials within our own borders; and fourth, what protective or retaliatory legislation can be undertaken.

It is as yet too early to speak of the results of these investigations; but one effect has already been of the most practical value, and that is that the notice given of the interest of the American Government in these transactions has in definite cases resulted in stemming the tide of advancing prices and has induced more moderation and consideration on the part of such foreign combinations.

Investigation of Foreign Competition and Foreign Markets in Agricultural Products.

Under authority of Congress, an exhaustive investigation was begun toward the close of the fiscal year into present and probable future foreign competition in export markets for agricultural products, and into the trends in demands for such products in foreign markets. An advisory committee, representing the farm organizations and trades, was formed at the initiation of the investigation.

Part IV.—LEGISLATION NEEDED.

The organic act includes the requirement that recommendations be made of legislation to promote the effective performance of the department in fostering and developing commerce and industry. Many steps are needed for better administration and the public welfare in revision of legislation that has not kept pace with our national growth in matters directly connected with the departmental activities.

Further Reorganization of the Department of Commerce.

The Department of Commerce 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 of the Government respecting these matters, and excluding the Shipping Board, there are still a large number of functions of the import designated 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 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, and each should be under an assistant secretary. Whether each of these groups is brought into this department is secondary to the necessity for the grouping itself in order to obtain concentration of purpose and elimination of overlap. Such a grouping is in the main recommended in the report to Congress on Reorganization of the Federal departments, submitted by President Harding during the last session. Direct savings of upward of \$1,000,000 per annum in administration could be made under a regrouping of this character, and many times this amount given to the American people in increased values and service.

Fisheries Conservation.

To prevent further depletion of the Alaskan fisheries, I earnestly recommend that legislative ratification be given to the Alaska fisheries reservations which have been established and

are now in operation under Executive order, and that legislative authority be given to the President, affirmatively empowering him to create further reservations covering the remaining Alaskan waters.

Pollution of Coastal Waters.

During the past year a large amount of data has been collected relative to the pollution of our coastal waters, which results largely from the unrestricted dumping in harbors or other inland waters of bilges of oil-burning ships. These data are contained in a comprehensive report by the Bureau of Mines, which is at present uncompleted, but which will probably be in finished form for submission to the coming session of Congress. It is a subject of great importance, for this pollution menaces the safety, health, and comfort of large numbers of our people.

Based upon the facts which will be available, I recommend that legislation be enacted for its prevention.

Amendment, Improvement, and Revision of the Navigation Laws.

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, might be ready for submission at the coming 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 the navigation laws, and to those actually engaged in the industry that the codification of these laws be no longer delayed.

Transfer of the Admeasurement of Vessels from the Treasury Department to the Department of Commerce.

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.

Load-Line Law.

Load-line bills were introduced in the Sixty-seventh Congress, but no legislation was enacted on the subject. 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 in the near future, inasmuch as our cargo-carrying steamers are now allowed to clear from the ports of these powers solely as an act of courtesy and not as a matter of right.

A representative committee has been named to draft a suitable bill for presentation to the next Congress; and it is hoped that during the coming session legislation upon this important subject may be enacted.

Radio Regulation.

The rapid growth of radio communication makes necessary an affirmative declaration by Congress of a governmental policy in accordance with which the art is to be conducted and the empowering of some agency to carry that policy into effect. This can only be done through an officer with discretionary powers and under regulations which will be made by him in conformity with the general terms of the law. I most earnestly commend this matter to the attention of Congress.

Aviation.

During the past year the commercial use of aircraft 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.

Federal Taxes on Americans Resident Abroad and Engaged in American Commerce.

The income taxes imposed upon our merchants resident abroad place them at a disadvantage in competition with the merchants of other nations. Some relief is afforded by the provision that the amount of taxes paid in the foreign countries may be deducted from the income tax which is payable to the United States, but this does not cover the entire problem. For instance, American merchants in the Latin-American countries, the Orient, and some European States pay our very high income tax, while the amount deductible for taxes paid in those countries is very small. British and some other merchants resident

there pay no taxes to their home Governments, and thus the cost of our doing business through merchants of our own nationality willing to reside abroad in the cause of promotion of American commerce is greater than that of our competitors or of our doing business through foreigners. No sound continuous distribution of our goods can be built up unless our own merchants are in the field selling goods upon service and contact as well as upon price.

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 salaries; and be accredited by the Department of State in the same manner as are the commercial attachés at present.

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

3. Legislation permitting the Secretary of Commerce to accept contributions of money for use in payment of expenses in connection with a particular piece of work or investigation.

Bureau of the Census.

It is recommended that the law concerning the collection of cotton statistics be amended so as to advance the dates for the early reports on quantity of cotton ginned; that provision be made for collecting information as to the several grades of cotton held in the United States at different dates; and that the act of August 7, 1916, providing for the collection of statistics of the quantity of cotton, linters, etc., used in the manufacture of guncotton and explosives be repealed, since this information, originally demanded by war conditions, is no longer important.

With a view to avoiding duplication it is recommended that the collection of data 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.

It is recommended that the Official Register be discontinued, and that instead the Bureau of the Census be authorized to compile statistics regarding the civilian personnel of the Federal Government. The Register costs about \$50,000 per issue and serves no sufficient purpose to justify this expense.

Lighthouse Service.

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

(a) Extension of the retirement law to cover (1) cases of disability in the field personnel of the Lighthouse Service; (2) retirement, in the discretion of the Secretary of Commerce, after 30 years of service; and (3) retirement of persons attending minor lights.

(b) 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.

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

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

(e) Provisions for the protection of aids to navigation damaged by passing vessels and making sums received in payment for such damages available for the repair of aids.

Adequate Building for Department.

The department's need for an adequate Government-owned building to provide necessary additional space and in which its now scattered bureaus may be brought together is so compelling that I feel it must be given special mention in this report. Exclusive of the Bureau of Standards, which is admirably housed in buildings especially adapted to its work and which, therefore, does not enter into the problem, there are approximately 1,980 employees of the department housed in the District of Columbia. Only 800 of these are housed in the so-called main building (and this building is rented), the other 1,180 employees being scattered in three buildings, two of which are ancient structures, expensive to operate and unsafe for the employees who are compelled to work in them. The third is one of the temporary war structures, which will be condemned within a year or two as unfit for habitation. It is now being used by the Census and contains invaluable records dating back to the founding of the Government which if destroyed could never be duplicated.

It is impossible to secure proper administration with the department so scattered over the city. Therefore, aside from the total unfitness of the buildings, it must be obvious that sound administration and efficient transaction of the public business demand the assembling under one roof of the now scattered activi-

ties of the department. Moreover, all the buildings are badly overcrowded. Additional space is imperatively needed. With normal growth of the department, not to speak of possible additions arising from a regrouping of Government functions, it is only a question of time before further services will have to be moved from the present main building, with resulting further disintegration and difficulties of administration.

The only cure for this whole situation is the erection of a modern Government-owned building adequate for the department's needs, and the economies in rent and better administration would more than cover interest upon the Government outlay. The construction of such a building would be sound economy.

Yours faithfully,

HERBERT HOOVER,
Secretary of Commerce.

Part V.—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, 1923.

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:

NEED FOR ADDITIONAL CLERKS.

The various divisions of the Secretary's office are service units for the entire department, the work of all bureaus filtering through one or more of these divisions in the course of handling. These divisions have for several years been undermanned, and while during the past few years the work has greatly increased, and is still increasing, there have been from 1919 to 1923, a period of five years, but three additions to the personnel of the Secretary's office—two stenographers to the Secretary and one stenographer to the Assistant Secretary. Additional help for all divisions is not only desirable but imperative. Employees have cheerfully worked overtime in an effort to keep the work current, but a continuation of this practice is unfair to the employees and is not a satisfactory solution of the problem. The work is constantly increasing, and a substantial addition to the personnel is absolutely necessary to the proper conduct and dispatch of business.

NEED FOR A GOVERNMENT-OWNED BUILDING.

An ever-present problem confronting the department is the need for a larger building to house its various bureaus and divisions. The department has long ago outgrown its present quarters, a rented

building, and is constantly resorting to makeshift methods, which do not tend to efficient functioning. The cramped condition under which we are laboring of necessity retards the work and lessens efficiency to a marked degree. The Commerce Building is virtually crowded to the walls, and increased activities and the constant demand for more space will soon necessitate the scattering of some services in outlying buildings, which means a further impairment of service. The remedy lies in the erection of a Government-owned building for the department of sufficient size to comfortably house its services now in the Commerce Building and those bureaus, except the Bureau of Standards, as are quartered in separate buildings, the nearest being more than a mile distant from the main building. This is a real problem, and I can not too strongly urge that it be given thoughtful consideration in the immediate future.

INADEQUATE TRAVEL ALLOWANCE.

Attention is invited to the inadequate travel allowance for employees traveling on Government business. The present allowance of \$5 per diem actual, or \$4 in lieu of subsistence, is insufficient. Effort has been made to have the Congress increase the allowance, but the recommendation has not received favorable consideration. Under present conditions employees are compelled to defray a large portion of their traveling expenses from personal funds. This is unjust and should be remedied.

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, 1923, 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, 1923, 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, 1923, 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, 1923, 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, 1924, as required by section 7 of the act of March 1, 1919 (40 Stat. 1268), will be transmitted to Congress in the usual form.

The table following 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, 1923:

Bureau.	Commerce and Labor act.	Deficiency act.	Allotments, fortifications act May 21, 1921.	Special act.	Total.
Office of the Secretary.....	\$344,250.00	\$9.62			\$344,259.62
Bureau of Foreign and Domestic Commerce.....	1,598,410.00	679,572.23		\$96,675.68	2,374,657.91
Bureau of the Census.....	1,737,680.00				1,737,680.00
Steamboat Inspection Service.....	906,140.00	60.47			906,200.47
Bureau of Navigation.....	357,390.00	5.81		13,332.24	370,728.05
Bureau of Standards.....	1,547,360.00	1,116.27	\$133,800.00		1,682,276.27
Coast and Geodetic Survey.....	2,176,975.00	37,681.23	3,080.00		2,217,736.23
Bureau of Lighthouses.....	8,351,790.00	26,266.38	5,000.00		8,383,056.38
Bureau of Fisheries.....	1,206,810.00	195,370.82			1,402,180.82
Printing and binding.....	425,000.00	38,750.00			463,750.00
Total.....	18,651,805.00	978,832.83	141,880.00	110,007.92	19,882,525.75
Increase of compensation.....				1,844,399.00	1,844,399.00
Grand total.....	18,651,805.00	978,832.83	141,880.00	1,954,406.92	21,726,924.75

Bureau.	Transferred to other departments.	Transferred to retirement.	Total transferred.	Net amount available for expenditures by this department.
Office of the Secretary.....		\$3,931.00	\$3,931.00	\$340,328.62
Bureau of Foreign and Domestic Commerce.....	\$104,500.00	10,078.79	114,578.79	2,260,079.12
Bureau of the Census.....		24,008.60	24,008.60	1,713,671.40
Steamboat Inspection Service.....		17,666.00	17,666.00	888,534.47
Bureau of Navigation.....		6,856.50	6,856.50	363,871.55
Bureau of Standards.....		37,330.00	37,330.00	1,644,946.27
Coast and Geodetic Survey.....	18,404.30	10,194.41	28,598.71	2,189,137.52
Bureau of Lighthouses.....	29,265.00	9,375.00	38,640.00	8,344,416.38
Bureau of Fisheries.....		9,700.00	9,700.00	1,392,480.82
Printing and binding.....				463,750.00
Total.....	152,169.30	129,140.30	281,309.60	19,601,216.15
Increase of compensation.....				1,844,399.00
Grand total.....	152,169.30	129,140.30	281,309.60	21,445,615.15

The disbursements by the authorized disbursing officers of the department during the fiscal year ended June 30, 1923, arranged according to items of appropriation, are as follows:

By disbursing clerk, Department of Commerce.

Office of the Secretary:

Contingent expenses, Department of Commerce, 1921.....	\$10. 72
Contingent expenses, Department of Commerce, 1922.....	8, 977. 25
Contingent expenses, Department of Commerce, 1923.....	133, 372. 00
Rent, Department of Commerce, 1922.....	5, 837. 50
Rent, Department of Commerce, 1923.....	61, 916. 66
Salaries, office of the Secretary, 1922.....	7, 998. 78
Salaries, office of the Secretary, 1923.....	178, 948. 94
Total.....	<u>397, 061. 88</u>

Bureau of Foreign and Domestic Commerce:

Commercial attachés, 1921.....	3. 24
Commercial attachés, 1922.....	435. 90
Commercial attachés, 1923.....	13, 940. 80
Compiling foreign trade statistics, 1923.....	84, 763. 33
Compiling foreign trade statistics, 1923-24.....	9, 529. 55
Enforcement China trade act, 1923.....	15, 622. 18
Export industries, 1922.....	8, 129. 92
Export industries, 1923.....	358, 181. 15
Investigating sources of crude rubber, 1923-24.....	19, 752. 51
Promoting commerce, Department of Commerce, 1921.....	1. 37
Promoting commerce, Department of Commerce, 1922.....	6, 566. 35
Promoting commerce, Department of Commerce, 1923.....	117, 683. 67
Promoting commerce, Far East, 1922.....	754. 35
Promoting commerce, Far East, 1923.....	61, 106. 99
Promoting commerce, South and Central America, 1922.....	734. 08
Promoting commerce, South and Central America, 1923.....	64, 092. 49
Salaries, foreign and domestic commerce, 1922.....	15, 383. 41
Salaries, foreign and domestic commerce, 1923.....	210, 675. 11
Total.....	<u>987, 356. 37</u>

Bureau of Standards:

Air Service, Army, War transfer, 1921.....	155. 45
Armament of fortifications, War transfer, 1921.....	484. 00
Aviation, Navy, Navy transfer, 1921.....	16, 136. 58
Aviation, Navy, Navy transfer, 1923.....	200. 51
Color standardization, 1921.....	. 21
Color standardization, 1922.....	1, 613. 98
Color standardization, 1923.....	8, 289. 77
Equipment, 1921.....	25. 80
Equipment, 1922.....	16, 090. 88
Equipment, 1923.....	46, 390. 40
Experiments, ordnance, Navy transfer, 1921.....	966. 68
Gauge standardization, 1922.....	862. 13
Gauge standardization, 1923.....	33, 947. 23
Gauge standardization, War transfer, 1922.....	418. 38
General expenses, 1921.....	67. 88
General expenses, 1922.....	9, 514. 71

Bureau of Standards—Continued.

General expenses, 1923	\$35,259.06
High-temperature investigation, 1922	404.87
High-temperature investigation, 1923	8,716.37
Improvement and care of grounds, 1922	1,372.92
Improvement and care of grounds, 1923	6,158.56
Industrial research, 1921	143,193.19
Industrial research, 1922	162,356.50
Industrial research, 1923	195,761.97
Investigation of clay products, 1922	1,474.92
Investigation of clay products, 1923	22,107.74
Investigation of fire-resisting properties, 1922	5,152.04
Investigation of fire-resisting properties, 1923	21,137.31
Investigation of mine scales and cars, 1921	3.25
Investigation of mine scales and cars, 1922	375.72
Investigation of mine scales and cars, 1923	7,311.49
Investigation of optical glass, 1921	3,280.54
Investigation of optical glass, 1922	4,867.35
Investigation of optical glass, 1923	20,486.94
Investigation of public-utility standards, 1922	4,610.08
Investigation of public-utility standards, 1923	72,998.36
Investigation of radioactive substances, 1923	7,390.28
Investigation of textiles, 1922	588.08
Investigation of textiles, 1923	19,509.04
Manufacture of arms, War transfer, 1921-22	216.86
Metallurgical research, 1922	2,839.29
Metallurgical research, 1923	32,959.31
Ordnance stores, ammunition, 1921-22	100.00
Party expenses, Coast and Geodetic Survey, standards transfer, 1923	161.32
Radio research, 1922	2,423.46
Radio research, 1923	26,372.92
Salaries, 1922	17,036.53
Salaries, 1923	387,613.48
Sound investigation, 1922	147.83
Sound investigation, 1923	3,614.02
Standardization of equipment, 1922	16,697.67
Standardization of equipment, 1923	76,740.60
Standardizing mechanical appliances, 1921	358.40
Standardizing mechanical appliances, 1922	2,087.74
Standardizing mechanical appliances, 1923	12,892.63
Sugar standardization, 1922	2,345.95
Sugar standardization, 1923	32,055.81
Testing machines, 1922	1,838.81
Testing machines, 1923	23,964.18
Testing miscellaneous materials, 1922	2,085.47
Testing miscellaneous materials, 1923	24,437.66
Testing railroad scales, 1922	2,092.41
Testing railroad scales, 1923	34,420.19
Testing structural materials, 1922	13,851.96
Testing structural materials, 1923	153,027.05
Standard materials, 1923	7,573.78
Total	1,759,845.50

Steamboat Inspection Service:

Clerk hire, 1922-----	\$8,964.33
Clerk hire, 1923-----	99,087.29
Contingent expenses, 1921-----	14.08
Contingent expenses, 1922-----	22,912.26
Contingent expenses, 1923-----	103,315.59
Salaries, office of Supervising Inspector General, 1922-----	937.15
Salaries, office of Supervising Inspector General, 1923-----	21,359.13
Salaries, Steamboat Inspection Service, 1922-----	48,042.96
Salaries, Steamboat Inspection Service, 1923-----	536,043.04
Total-----	<u>840,675.83</u>

Bureau of Navigation:

Admeasurement of vessels, 1922-----	275.56
Admeasurement of vessels, 1923-----	2,981.43
Clerk hire, shipping service, 1922-----	5,263.17
Clerk hire, shipping service, 1923-----	59,893.98
Contingent expenses, shipping service, 1922-----	1,759.67
Contingent expenses, shipping service, 1923-----	7,548.38
Enforcement of navigation laws, 1922-----	3,704.62
Enforcement of navigation laws, 1923-----	55,119.20
Enforcement of wireless communication laws, 1922-----	5,277.64
Enforcement of wireless communication laws, 1923-----	115,065.77
Preventing overcrowding of passenger vessels, 1922-----	2,913.27
Preventing overcrowding of passenger vessels, 1923-----	8,639.05
Salaries, Bureau of Navigation, 1922-----	1,743.98
Salaries, Bureau of Navigation, 1923-----	37,871.37
Salaries, shipping service, 1922-----	2,300.05
Salaries, shipping service, 1923-----	26,400.34
Total-----	<u>336,757.48</u>

Bureau of Fisheries:

Buildings and water supply, Fur Seal Islands, Alaska-----	378.00
Fish hatchery, Washington-----	94.25
Fish hatchery, Wyoming-----	101.16
Fish hatchery, Duluth, Minn., 1923-----	1,868.29
Fish hatchery, Gloucester, Mass., 1923-----	4,605.61
Fish hatchery, San Marcos, Tex-----	1,254.39
Fish hatchery, Yes Bay, Alaska, 1923-----	6,292.11
Fish-rescue station, Mississippi River, 1923-----	4,566.52
Investigating damages to fisheries-----	343.85
Marine biological station, Florida-----	214.76
Miscellaneous expenses, 1921-----	40.41
Miscellaneous expenses, 1922-----	73,434.61
Miscellaneous expenses, 1923-----	433,301.26
Miscellaneous expenses, 1923-24-----	2,787.88
Pay, officers and crew of vessel, Alaska fisheries service, 1923-----	4,341.50
Protecting seal and salmon fisheries, Alaska, 1922-----	6,035.70
Protecting seal and salmon fisheries, Alaska, 1923-----	131,321.50
Protecting seal and salmon fisheries, Alaska, 1923-24-----	83,387.24
Salaries, Bureau of Fisheries, 1922-----	28,171.01
Salaries, Bureau of Fisheries, 1923-----	387,144.16
Total-----	<u>1,169,684.21</u>

Bureau of the Census:

Expenses of the Fourteenth Census, 1920-1922	\$237, 414. 44
Collecting statistics, 1923	673, 827. 98
Salaries, Bureau of the Census, 1923	730, 145. 00
Tabulating machines, 1923	32, 794. 85
Total	<u>1, 674, 182. 27</u>

Bureau of Lighthouses:

Aids to navigation, Conneaut Harbor, Ohio	9. 86
Aids to navigation, Delaware Bay entrance	18. 64
Aids to navigation, Florida coast	121. 19
Aids to navigation, Florida Reefs, Fla	16. 98
Aids to navigation, Huron Harbor, Ohio	27. 18
Aids to navigation, St. Marys River, Mich	36. 24
Aids to navigation, Alaska	1, 641. 94
Detroit River lights, Michigan	66. 39
Lighthouse depot, Detroit, Mich	19. 62
Great Salt Pond Light Station, R. I.	7. 37
Spectacle Reef Light Station, Mich	61. 68
Southwest Pass Light Vessel, Mississippi River, La	4. 46
Radio installation on lighthouse tenders	4, 980. 27
Repairing and rebuilding aids to navigation, Gulf of Mexico	66. 72
Repairing and rebuilding aids to navigation, Seventh light-house district, 1922-23	649. 72
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts	10. 96
Tender for third lighthouse district	3, 061. 15
Vessels for Lighthouse Service	385, 636. 57
General expenses, Lighthouse Service, 1921	803. 01
General expenses, Lighthouse Service, 1922	30, 383. 99
General expenses, Lighthouse Service, 1923	61, 085. 05
Salaries, Bureau of Lighthouses, 1922	2, 706. 64
Salaries, Bureau of Lighthouses, 1923	63, 488. 46
Salaries, Lighthouse Service, 1922	229. 17
Salaries, Lighthouse Service, 1923	5, 748. 58
Salaries, lighthouse vessels, 1922	5. 38
Salaries, lighthouse vessels, 1923	2, 714. 97
Total	<u>563, 602. 19</u>

Miscellaneous:

Increase of compensation, 1921	. 67
Increase of compensation, 1922	30, 674. 82
Increase of compensation, 1923	686, 389. 14
Printing and binding, Department of Commerce, 1923	336, 937. 91
Total	<u>1, 054, 002. 54</u>
Grand total	<u>8, 782, 668. 27</u>

By disbursing officers, Lighthouse Service.

Aids to navigation, Alaska	\$69, 755. 28
Aids to navigation, Ashtabula Harbor, Ohio	2, 008. 03
Aids to navigation, Calumet Harbor, Ill	34, 738. 94

Aids to navigation, Chesapeake Bay, Md. and Va.....	\$102.00
Aids to navigation, Conneaut Harbor, Ohio.....	1,144.29
Aids to navigation, Coquille River, Oreg.....	4,023.05
Aids to navigation, Delaware Bay entrance.....	12,312.70
Aids to navigation, Fairport Harbor, Ohio.....	28.00
Aids to navigation, Fighting Island Channel, Detroit River.....	77.76
Aids to navigation, Florida coasts, Fla.....	3,212.20
Aids to navigation, Florida reefs, Fla.....	1,460.88
Aids to navigation, Huron Harbor, Ohio.....	143.47
Aids to navigation, Indiana Harbor, Ind.....	20,733.07
Aids to navigation, Keweenaw Waterway, Mich.....	109.95
Aids to navigation, Pearl Harbor, Hawaii.....	2,922.27
Aids to navigation, Raritan Bay and connected waters, N. Y. and N. J.....	80,800.74
Aids to navigation, St. Johns River, Fla.....	2,903.10
Aids to navigation, St. Marys River, Mich.....	1,132.17
Aids to navigation, Washington and Oregon.....	194.35
Depot for sixteenth lighthouse district.....	341.42
Detroit Lighthouse Depot, Mich.....	43,728.42
San Juan Lighthouse Depot, P. R.....	48,698.58
Staten Island Lighthouse Depot, N. Y. (machine shop).....	4.66
Detroit River Lights, Mich.....	4,441.67
Diamond Shoal Light Vessel, N. C.....	6,356.80
Fifth lighthouse district gas buoys.....	3,746.13
Chicago Harbor Light Station, Ill.....	379.53
Galveston Jetty Light Station, Tex.....	1,001.38
Great Salt Pond Light Station, R. I.....	179.85
Point Borinquen Light Station, P. R.....	41.50
Point Vicente Light Station, Calif.....	2,139.02
Sabine Pass Jetty Light Station, Tex.....	9,826.68
Sand Island Light Station, Ala.....	229.24
Spectacle Reef Light Station, Mich.....	12,733.24
Light-keepers' dwellings.....	8,798.46
Nantucket Harbor Fog Signal, Mass.....	2,908.99
Repairing and rebuilding aids to navigation, Atlantic coast.....	6,012.23
Repairing and rebuilding aids to navigation, Gulf of Mexico.....	9,413.33
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts.....	4,991.21
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922-23.....	15,614.40
Riprap protection for light station, third lighthouse district.....	51,464.73
Southwest Pass Light Vessel, Mississippi River.....	360.00
Tender for third lighthouse district.....	2,538.45
Vessels for Lighthouse Service.....	36,185.69
General expenses, Lighthouse Service, 1921.....	6,004.72
General expenses, Lighthouse Service, 1922.....	722,996.75
General expenses, Lighthouse Service, 1923.....	3,431,386.12
Retired pay, Lighthouse Service, 1922.....	2,963.72
Retired pay, Lighthouse Service, 1923.....	83,364.30
Salaries, keepers of lighthouses, 1921.....	60.00
Salaries, keepers of lighthouses, 1922.....	35,344.50
Salaries, keepers of lighthouses, 1923.....	1,228,341.93
Salaries, Lighthouse Service, 1922.....	4,343.82
Salaries, Lighthouse Service, 1923.....	381,129.17

Salaries, lighthouse vessels, 1922	\$55, 532. 79
Salaries, lighthouse vessels, 1923	1, 511, 035. 64
Increase of compensation, Department of Commerce, 1921	. 48
Increase of compensation, Department of Commerce, 1922	28, 423. 10
Increase of compensation, Department of Commerce, 1923	866, 118. 79
Total	8, 866, 983. 78

By special disbursing agent, Coast and Geodetic Survey.

Alterations to mine sweepers, Coast and Geodetic Survey, 1922-23	\$59, 961. 21
Alterations to mine sweepers, Coast and Geodetic Survey, 1923	30, 283. 72
General expenses, Coast and Geodetic Survey, 1922	17, 698. 31
General expenses, Coast and Geodetic Survey, 1923	58, 400. 58
Geological Survey (Interior, transfer to Commerce), 1923	184. 88
Party expenses, Coast and Geodetic Survey, 1921	2. 00
Party expenses, Coast and Geodetic Survey, 1922	89, 299. 15
Party expenses, Coast and Geodetic Survey, 1923	406, 757. 85
Pay and allowances, commissioned officers, 1922	39, 894. 93
Pay and allowances, commissioned officers, 1923	373, 263. 22
Party expenses, Coast and Geodetic Survey, 1923 (Interior, civil transfer)	788. 73
Pay, etc., officers and men, vessels, Coast and Geodetic Survey, 1922	78, 984. 33
Pay, etc., officers and men, vessels, Coast and Geodetic Survey, 1923	350, 371. 42
Repairs of vessels, Coast Survey, 1922	18, 397. 06
Repairs of vessels, Coast Survey, 1923	46, 262. 99
Salaries, Coast and Geodetic Survey, 1922	54. 71
Salaries, Coast and Geodetic Survey, 1923	282, 463. 40
Increase of compensation, Department of Commerce, 1922	16, 249. 51
Increase of compensation, Department of Commerce, 1923	144, 378. 74
Total	2, 013, 696. 74

By special disbursing agents, Bureau of Standards.

General expenses, Bureau of Standards, 1923	\$886. 84
Salaries, Bureau of Standards, 1923	1, 714. 37
Increase of compensation, Department of Commerce, 1923	180. 00
Total	2, 781. 21

By commercial agents of the department investigating trade conditions abroad.

Commercial attachés, 1923	\$166, 647. 07
Enforcement of China trade act, 1923	3, 829. 35
Export industries, 1923	30, 507. 34
Investigating sources of crude rubber, 1923-24	4, 636. 74
Promoting commerce, Department of Commerce, 1923	220, 755. 06
Promoting commerce, Far East, 1923	84, 420. 49
Promoting commerce, South and Central America, 1923	72, 645. 77
Increase of compensation, Department of Commerce, 1923	6, 877. 65
Total	590, 319. 47

By special disbursing agents, Bureau of Fisheries.

Miscellaneous expenses, Bureau of Fisheries, 1923.....	\$25, 543. 43
Pay, officers and crew of vessels, Alaska fisheries service, 1923.....	22, 631. 49
Protecting seal and salmon fisheries of Alaska, 1923.....	41, 265. 49
Increase of compensation, Department of Commerce, 1923.....	4, 325. 35
Total.....	93, 765. 76

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, 1923, classified according to items of appropriation:

Office of the Secretary:

Contingent expenses, Department of Commerce, 1921.....	\$32. 72
Contingent expenses, Department of Commerce, 1922.....	1, 996. 01
Contingent expenses, Department of Commerce, 1923.....	5, 510. 74
Certified claims—Contingent expenses, Department of Commerce, 1918.....	7. 76
Total.....	7, 547. 23

Bureau of Foreign and Domestic Commerce:

Commercial attachés, 1921.....	67. 76
Commercial attachés, 1922.....	55. 60
Commercial attachés, 1923.....	98. 54
Enforcement of China trade act, 1923.....	20. 67
Export industries, 1922.....	1. 74
Export industries, 1923.....	952. 93
Promoting commerce, Department of Commerce, 1921.....	42. 50
Promoting commerce, Department of Commerce, 1922.....	336. 36
Promoting commerce, Department of Commerce, 1923.....	1, 079. 33
Promoting commerce, Far East, 1921.....	24. 75
Promoting commerce, Far East, 1922.....	56. 36
Promoting commerce, Far East, 1923.....	566. 75
Promoting commerce, South and Central America, 1921.....	46. 74
Promoting commerce, South and Central America, 1922.....	38. 21
Promoting commerce, South and Central America, 1923.....	676. 11
Certified claims—Promoting commerce, Department of Commerce, 1919.....	10. 01
Total.....	4, 074. 36

Bureau of Standards:

Color standardization, 1923.....	11. 84
Equipment, 1921.....	37. 88
Equipment, 1922.....	307. 68
Equipment, 1923.....	156. 09
General expenses, 1921.....	1. 25
General expenses, 1922.....	2, 053. 07
General expenses, 1923.....	17, 543. 23
Industrial research, 1921.....	554. 88
Industrial research, 1922.....	2, 446. 69

Bureau of Standards—Continued.

Industrial research, 1923.....	\$1,259.19
Investigation of fire-resisting properties, 1922.....	108.40
Investigation of fire-resisting properties, 1923.....	102.15
Investigation of public-utility standards, 1922.....	24.00
Investigation of radioactive substances, 1923.....	130.45
Investigation of textiles, 1922.....	3.15
Investigation of textiles, 1923.....	31.99
Radio research, 1923.....	100.92
Standardization of equipment, 1922.....	103.26
Testing machines, 1923.....	463.81
Testing railroad scales, 1922.....	275.77
Testing railroad scales, 1923.....	1,109.28
Testing structural materials, 1922.....	76.21
Testing structural materials, 1923.....	95.93
Certified claims—	
Equipping chemical laboratory, 1919–20.....	954.51
National security and defense, military research, 1919.....	8.89
Total.....	<u>963.40</u>
Total.....	<u>27,960.02</u>

Bureau of Navigation:

Refunding moneys erroneously received and covered into the Treasury.....	1,307.27
Refunding penalties or charges erroneously exacted.....	4,316.70
Refund of navigation fees to Peninsular & Occidental Steamship Co. (Private Act No. 120, 67th Cong.).....	7,717.20
Contingent expenses, shipping service, 1922.....	71.69
Enforcement of navigation laws, 1922.....	71.07
Enforcement of wireless communication laws, 1922.....	78.25
Enforcement of wireless communication laws, 1923.....	70.00
Certified claims—Preventing overcrowding of passenger vessels, 1920.....	4.96
Total.....	<u>13,637.14</u>

Steamboat Inspection Service:

Contingent expenses, 1921.....	.96
Contingent expenses, 1922.....	325.13
Contingent expenses, 1923.....	220.48
Certified claims—Contingent expenses, 1919.....	11.07
Total.....	<u>557.64</u>

Bureau of Fisheries:

Fish hatchery, Wyoming.....	535.54
Fish hatchery, Duluth, Minn., 1923.....	88.54
Fish hatchery, Gloucester, Mass., 1923.....	1,418.85
Fish hatchery, Yes Bay, Alaska, 1923.....	45.00
Miscellaneous expenses, 1921.....	1.90
Miscellaneous expenses, 1922.....	4,998.55
Miscellaneous expenses, 1923.....	7,635.84
Protecting seal and salmon fisheries of Alaska, 1922.....	1,721.01
Protecting seal and salmon fisheries of Alaska, 1923.....	2,715.90

Bureau of Fisheries—Continued.

Certified claims—

Miscellaneous expenses, 1918	-----	\$3. 25
Miscellaneous expenses, 1919	-----	1. 70
Miscellaneous expenses, 1920	-----	1. 60
Total	-----	<u>19, 162. 68</u>

Bureau of the Census:

Collecting statistics, 1923	-----	234. 00
Expenses of Fourteenth Census, 1920-1922	-----	11, 276. 27
Total	-----	<u>11, 510. 27</u>

Coast and Geodetic Survey:

Alterations to mine sweepers, 1922-23	-----	9, 573. 60
General expenses, 1921	-----	4. 66
General expenses, 1922	-----	487. 14
General expenses, 1923	-----	1, 722. 81
Party expenses, 1921	-----	24. 62
Party expenses, 1922	-----	31, 620. 81
Party expenses, 1923	-----	9, 807. 38
Pay and allowances, commissioned officers, 1923	-----	932. 07
Repairs of vessels, 1921	-----	2, 879. 69
Repairs of vessels, 1922	-----	3, 697. 75
Repairs of vessels, 1923	-----	775. 86
Certified claims—		
Party expenses, 1919	-----	7. 46
Pay, etc., officers and men, vessels, 1919	-----	9. 90
Total	-----	<u>61, 543. 75</u>

Bureau of Lighthouses:

Aids to navigation, Alaska	-----	975. 64
Aids to navigation, Delaware Bay entrance	-----	202. 20
Aids to navigation, Florida coast	-----	7. 11
Aids to navigation, Florida Reefs, Fla	-----	29. 66
Fifth lighthouse district gas buoys	-----	488. 25
Diamond Shoal Light Vessel, N. C.	-----	97. 00
Light vessels for general service	-----	13, 381. 00
Radio installations on lighthouse tenders	-----	33. 70
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts	-----	20. 33
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922-23	-----	115. 40
Vessels for Lighthouse Service	-----	10. 23
General expenses, Lighthouse Service, 1921	-----	2, 430. 90
General expenses, Lighthouse Service, 1922	-----	89, 085. 77
General expenses, Lighthouse Service, 1923	-----	38, 626. 17
Salaries, keepers of lighthouses, 1922	-----	133. 50
Salaries, keepers of lighthouses, 1923	-----	66. 67
Salaries, lighthouse vessels, 1922	-----	3, 719. 84
Salaries, lighthouse vessels, 1923	-----	4, 293. 28
Certified claims—		
General expenses, 1916	-----	3. 04
General expenses, 1917	-----	40. 75
General expenses, 1918	-----	5. 56

Bureau of Lighthouses—Continued.

Certified claims—Continued.

General expenses, 1919-----	\$2,367.99
General expenses, 1920-----	5,606.89
Salaries, keepers of lighthouses, 1907-----	40.45
Total-----	<u>161,781.33</u>

Miscellaneous:

Increase of compensation, Department of Commerce, 1923-----	16.67
Claims for damages by collision with light vessels-----	499.00
Total-----	<u>515.67</u>
Grand total-----	<u>308,290.09</u>

EXPENDITURES DURING THE FISCAL YEAR ENDED JUNE 30, 1923, ON ACCOUNT OF ALL APPROPRIATIONS UNDER THE CONTROL OF THE DEPARTMENT, GIVING THE TOTAL AMOUNT EXPENDED BY EACH BUREAU.

Bureau.	By disbursing clerk of the department.	By special disbursing agents of department.	By General Accounting Office.	Total.
Office of the Secretary-----	\$453,148.44		\$7,547.23	\$460,695.67
Bureau of the Census-----	1,897,243.93		11,510.27	1,908,754.20
Coast and Geodetic Survey-----	30,187.04	\$2,013,696.74	61,543.75	2,105,427.53
Bureau of Fisheries-----	1,274,486.84	93,765.76	19,162.68	1,387,415.28
Bureau of Foreign and Domestic Commerce-----	1,235,157.04	590,319.47	4,074.36	1,829,550.87
Bureau of Lighthouses-----	591,317.25	8,866,983.78	162,297.00	9,620,598.03
Bureau of Navigation-----	404,962.32		13,637.14	418,599.46
Bureau of Standards-----	1,966,602.57	2,781.21	27,960.02	1,997,343.80
Steamboat Inspection Service-----	929,562.84		557.64	930,120.48
Total-----	8,782,668.27	11,567,546.96	308,290.09	20,658,505.32

The following statement shows the expenditures during the fiscal year ended June 30, 1923, on account of all appropriations under the control of the department, giving the total amounts disbursed by the various disbursing officers of the department and miscellaneous receipts for the same period:

By the disbursing clerk, Department of Commerce, on account of salaries and expenses of the office of the Secretary of Commerce, the Bureaus of Foreign and Domestic Commerce, Navigation, Standards, Fisheries, Census, and Lighthouses, the office of the Supervising Inspector General, Steamboat Inspection Service, salaries and expenses of the Steamboat Inspection Service at large, and public works of the Lighthouse and Fisheries Service (shown in detail in the first of the foregoing tables of disbursements)-----	\$8,782,668.27
By the authorized disbursing officers of the Lighthouse Service-----	8,866,983.78
By the special disbursing agent, Coast and Geodetic Survey-----	2,013,696.74
By the special disbursing agents, Bureau of Fisheries-----	93,765.76
By the commercial agents of the department investigating trade conditions abroad, as special disbursing agents-----	590,319.47

By the special disbursing agents, Bureau of Standards.....	\$2, 781. 21
By warrants drawn on the Treasurer of the United States to satisfy accounts settled by the Auditor for the State and Other Departments.....	308, 290. 00
Total	<u>20, 658, 505. 32</u>

MISCELLANEOUS RECEIPTS.

Coast and Geodetic Survey: Sale of charts, publications, old property, etc.....	63, 551. 50
Bureau of the Census: Sale of publications, etc.....	419. 00
Bureau of Fisheries:	
Sale of 41,075 sealskins.....	238, 068. 79
Sale of 1,884 fox skins.....	164, 472. 97
Sale of seal-oil barrels.....	238. 15
Sale of 28 terrapins.....	54. 10
Meals furnished employees at isolated stations.....	2, 946. 73
Sale of old property.....	2, 886. 69
Reimbursement for loss and damage to Government property.....	50. 39
Bureau of Standards:	
Test fees.....	37, 934. 30
Reimbursement for damage to Government property.....	3. 00
Steamboat Inspection Service: Sale of old property, etc.....	246. 44
Bureau of Lighthouses:	
Sale of old property, etc.....	44, 036. 12
Reimbursement for loss and damage to Government property.....	4, 961. 07
Sale of empty oil cans.....	2, 048. 43
Reimbursements by private concerns for work done.....	4, 980. 69
Rentals.....	4, 426. 70
Default in contracts.....	128. 60
Interest on debts due United States by individuals.....	2, 678. 79
Bureau of Foreign and Domestic Commerce:	
Photostatic work done.....	13. 35
Registration fees, etc., China trade act.....	375. 00
Office of the Secretary:	
Sale of waste paper.....	2, 723. 17
Miscellaneous refunds.....	1, 078. 97
Bureau of Navigation:	
Tonnage duties.....	1, 688, 786. 68
Navigation fees.....	221, 678. 56
Navigation fines.....	36, 914. 62
Reimbursement for loss of Government property.....	17. 02
Total	<u>2, 525, 719. 83</u>

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1923, in accordance with the act of June 20, 1874 (18 Stat. 110-111):

Salaries, office of the Secretary of Commerce, 1921.....	\$5, 891. 76
Increase of compensation, Department of Commerce, 1918.....	3. 48
Increase of compensation, Department of Commerce, 1920.....	10, 065. 56

Increase of compensation, Department of Commerce, 1921.....	\$37,354.40
Increase of compensation, Department of Commerce, 1922.....	59,774.05
Contingent expenses, Department of Commerce, 1921.....	615.08
Rent, Department of Commerce, 1921.....	471.53
Collecting statistics, Bureau of the Census, 1919.....	12.06
Salaries, Bureau of Foreign and Domestic Commerce, 1921.....	15,532.08
Commercial attachés, Department of Commerce, 1915.....	3.76
Commercial attachés, Department of Commerce, 1917.....	37.18
Commercial attachés, Department of Commerce, 1918.....	368.18
Commercial attachés, Department of Commerce, 1919.....	544.83
Commercial attachés, Department of Commerce, 1920.....	817.39
Commercial attachés, Department of Commerce, 1921.....	4,648.80
Promoting commerce, Department of Commerce, 1917.....	265.54
Promoting commerce, Department of Commerce, 1918.....	1,774.40
Promoting commerce, Department of Commerce, 1919.....	687.96
Promoting commerce, Department of Commerce, 1920.....	2,988.87
Promoting commerce, Department of Commerce, 1921.....	20,981.41
Promoting commerce, South and Central America, 1918.....	139.48
Promoting commerce, South and Central America, 1919.....	22.74
Promoting commerce, South and Central America, 1920.....	766.22
Promoting commerce, South and Central America, 1921.....	4,211.60
Promoting commerce in the Far East, 1919.....	30
Promoting commerce in the Far East, 1920.....	270.76
Promoting commerce in the Far East, 1921.....	1,109.82
Salaries, office of Supervising Inspector General, Steamboat Inspection Service, 1921.....	330.92
Salaries, Steamboat Inspection Service, 1921.....	20,671.39
Clerk hire, Steamboat Inspection Service, 1921.....	2,188.22
Contingent expenses, Steamboat Inspection Service, 1919.....	1.05
Contingent expenses, Steamboat Inspection Service, 1920.....	8.99
Contingent expenses, Steamboat Inspection Service, 1921.....	8,410.42
Salaries, Bureau of Navigation, 1921.....	1,046.32
Salaries, shipping service, 1921.....	1,652.00
Clerk hire, shipping service, 1921.....	1,465.24
Contingent expenses, shipping service, 1921.....	154.15
Admeasurement of vessels, 1921.....	11.98
Preventing overcrowding of passenger vessels, 1920.....	15.88
Preventing overcrowding of passenger vessels, 1921.....	22.55
Enforcement of navigation laws, 1921.....	78.33
Enforcement of wireless communication laws, 1921.....	186.48
Salaries, Bureau of Standards, 1921.....	11,359.76
Equipment, Bureau of Standards, 1920.....	2.70
Equipment, Bureau of Standards, 1921.....	3,957.14
General expenses, Bureau of Standards, 1920.....	43.14
General expenses, Bureau of Standards, 1921.....	3,245.65
Improvement and care of grounds, Bureau of Standards, 1921.....	66.49
Color standardization, Bureau of Standards, 1921.....	221.10
Equipping laboratory, Bureau of Standards, 1919-20.....	5.18
Gauge standardization, Bureau of Standards, 1921.....	1,536.09
High-temperature investigations, Bureau of Standards, 1921.....	36.22
Industrial research, Bureau of Standards, 1919-20.....	1.38
Industrial research, Bureau of Standards, 1921.....	23,305.27
Investigation of clay products, Bureau of Standards, 1921.....	481.59

Investigation of fire-resisting properties, Bureau of Standards, 1921	\$504.57
Investigation of mine scales and cars, Bureau of Standards, 1918-19	.70
Investigation of mine scales and cars, Bureau of Standards, 1921	3,236.52
Investigation of optical glass, Bureau of Standards, 1921	81.48
Investigation of public-utility standards, Bureau of Standards, 1920	4.70
Investigation of public-utility standards, Bureau of Standards, 1921	152.95
Investigation of railway materials, Bureau of Standards, 1921	248.12
Investigation of textiles, etc., Bureau of Standards, 1921	112.12
Metallurgical research, Bureau of Standards, 1921	145.77
Military research, Bureau of Standards, 1917-18	1.00
Radio research, Bureau of Standards, 1921	194.04
Sound investigation, Bureau of Standards, 1921	90.32
Standardization of equipment, Bureau of Standards, 1921	5,790.75
Standardizing mechanical appliances, Bureau of Standards, 1921	377.09
Sugar standardization, Bureau of Standards, 1921	139.15
Testing Government materials, Bureau of Standards, 1921	1,415.75
Testing machines, Bureau of Standards, 1921	100.51
Testing miscellaneous materials, Bureau of Standards, 1921	83.89
Testing railroad scales, etc., Bureau of Standards, 1919	2.25
Testing railroad scales, etc., Bureau of Standards, 1920	6.13
Testing railroad scales, etc., Bureau of Standards, 1921	528.51
Testing structural materials, Bureau of Standards, 1919	35.74
Testing structural materials, Bureau of Standards, 1920	68.50
Testing structural materials, Bureau of Standards, 1921	702.74
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1921	100,949.41
Salaries, Coast and Geodetic Survey, 1921	10,717.58
Party expenses, Coast and Geodetic Survey, 1921	28,521.18
General expenses, Coast and Geodetic Survey, 1921	2,037.10
Pay, etc., of officers and men, vessels, Coast Survey, 1921	92,054.59
Repairs of vessels, Coast Survey, 1921	4,140.41
Alterations to vessels transferred from Navy, Coast Survey, 1920-21	34.39
Alterations to vessels transferred from Navy, Coast Survey, 1921	744.40
Salaries, Bureau of Lighthouses, 1921	4,326.24
Retired pay, Lighthouse Service, 1921	2,112.23
General expenses, Lighthouse Service, 1917	3,579.64
General expenses, Lighthouse Service, 1918	5,849.50
General expenses, Lighthouse Service, 1919	12,226.27
General expenses, Lighthouse Service, 1920	1,018.97
General expenses, Lighthouse Service, 1921	43,787.41
Salaries, keepers of lighthouses, 1921	5,950.22
Salaries, lighthouse vessels, 1921	13,722.86
Salaries, Lighthouse Service, 1921	8,859.84
Nantucket Harbor fog signal, Mass	19.44
Aids to navigation, Florida Reefs, Fla	17.57
Aids to navigation, Ashtabula Harbor, Ohio	24.51
Aids to navigation, Huron Harbor, Ohio	16.40
Aids to navigation, Keweenaw Waterway, Mich	15.35
Aids to navigation, Fighting Island Channel, Detroit River, Mich	6.09
Point Jigero Light Station, P. R.	578.78
Aids to navigation, Guantanamo Bay, Cuba	117.52
Tender and barge for eighth lighthouse district	90.86

Salaries, Bureau of Fisheries, 1921.....	\$40,609.19
Miscellaneous expenses, Bureau of Fisheries, 1919.....	5.43
Miscellaneous expenses, Bureau of Fisheries, 1920.....	103.15
Miscellaneous expenses, Bureau of Fisheries, 1921.....	3,962.83
Buildings and water supply, fur-seal islands, Alaska.....	.97
Developing aquatic sources of leather, Bureau of Fisheries, 1921.....	3,394.58
Pay of officers and crews of vessels, Alaska fisheries service, 1921.....	4,017.95
Protecting seal and salmon fisheries of Alaska, 1921.....	196.77
Biological station, Mississippi River Valley, 1920-21.....	70.18
Fish hatchery, Bozeman, Mont.....	5.20
Fish hatchery, Clackamas, Oreg.....	.21
Fish hatchery, Washington.....	5.48
Fish hatchery, Woods Hole, Mass., 1920-21.....	300.20
Total.....	658,079.07
Armament of fortifications, Commerce transfer.....	64,831.70
Armament of fortifications (War transfer, fortifications act, May 21, 1920), 1921.....	21.99
Aviation, Navy (Navy transfer under fortifications act May 21, 1920), 1921.....	3,554.67
Experiments, Bureau of Ordnance (Navy transfer under fortifications act May 21, 1920), 1921.....	4.61
Testing structural materials, Bureau of Standards (Interior, civil transfer under act of May 21, 1920), 1921.....	367.36
Party expenses, Coast and Geodetic Survey (Interior, civil transfer under act of May 21, 1920), 1921.....	3,164.14
National security and defense, commodity experts, 1919.....	373.73
Total.....	72,318.20
Grand total.....	730,397.27

In the last nine years the Department of Commerce has turned back unused into the Treasury the following amounts:

June 30, 1915.....	\$247,482.22	June 30, 1921.....	\$4,042,434.38
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, 1919.....	476,045.10	Total.....	7,747,109.66
June 30, 1920.....	1,149,363.28		

ESTIMATES FOR FISCAL YEAR ENDING JUNE 30, 1925.

COMPARISON BETWEEN THE ITEMS OF ESTIMATES FOR THE DEPARTMENT OF COMMERCE SUBMITTED FOR THE FISCAL YEAR 1925 AND APPROPRIATIONS FOR THE FISCAL YEAR 1924.

[It should be noted that under appropriation for 1924 both the items for regular appropriations and bonus should be taken together as a total expense for each item for the appropriation for that year and for comparison with the estimate for 1925, as the latter includes reclassification salaries which take the place of bonus allowances. The various amounts asked for as supplemental estimates are for the extension of necessary activities or to prevent the impairment of services of the department; and in the case of the item for the agricultural decennial census the supplemental estimate is to cover the cost of this census to be taken under statutory authority and is an extraordinary and not a routine expenditure.]

Bureau.	Appropriations, 1924.			Estimates, 1925.		
	Regular.	Bonus.	Total.	Regular.	Supplemental.	Total.
OFFICE OF SECRETARY.						
Salaries.....	\$169,350	\$29,280	\$198,630	\$258,460		\$258,460
General administration.....				150,000		150,000
Contingent.....	69,900		69,900	88,807		88,807
Rent.....	68,000		68,000	68,000		68,000
Printing and binding.....	461,500		461,500	645,193		645,193
Total.....	768,750	29,280	798,030	1,210,460		1,210,460
BUREAU OF FOREIGN AND DOMESTIC COMMERCE.						
Salaries.....	232,510	34,560	267,070	277,580		277,580
Commercial attachés.....	225,000	5,280	230,280	255,220	\$94,780	350,000
Promoting commerce, Europe and other areas.....	379,100	6,480	385,580	458,170		458,170
District and cooperative offices.....	150,000	13,960	163,960	320,880		320,880
Promoting commerce, South and Central America.....	200,000	7,104	207,104	285,710	16,456	302,166
Promoting commerce, Far East.....	200,000	5,280	205,280	284,930	15,520	300,450
Export industries.....	550,000	51,840	601,840	726,850		726,850
Enforcing China trade act.....	38,000	960	38,960	31,260		31,260
Distribution in domestic trade.....	50,000	4,320	54,320	165,500		165,560
Investigating farm products ¹		1,920	401,920	100,000		100,000
Raw materials ¹	400,000	5,712	5,712	146,580		146,580
Transporting remains.....	1,500		1,500	1,500		1,500
Transporting families.....	15,000		15,000	50,000		50,000
Foreign trade restrictions.....	25,000	3,120	28,120	54,940		54,940
Foreign buyers.....	10,000	1,200	11,200	33,120		33,120
Foreign trade statistics, economic abstract.....	150,000	39,360	189,360	400,000		400,000
Total.....	2,626,110	181,096	2,807,206	3,592,300	126,756	3,719,056
BUREAU OF THE CENSUS.						
Salaries.....	802,340	143,280	945,620	989,980		989,980
Collecting statistics.....	895,000	67,215	961,215	810,000		810,000
Tabulating machines.....	35,000	4,320	39,320	42,620		42,620
Census of agriculture.....				4,000,000		4,000,000
Total.....	1,732,340	213,815	1,946,155	1,842,600	4,000,000	5,842,600

¹ Appropriations for rubber investigations.

COMPARISON BETWEEN THE ITEMS OF ESTIMATES FOR THE DEPARTMENT OF COMMERCE SUBMITTED FOR THE FISCAL YEAR 1925 AND APPROPRIATIONS FOR THE FISCAL YEAR 1924—Continued.

Bureau.	Appropriations, 1924.			Estimates, 1925.		
	Regular.	Bonus.	Total.	Regular.	Supplemental.	Total.
STEAMBOAT INSPECTION SERVICE.						
Salaries, office.....	\$22,940	\$2,880	\$25,820	\$27,960		\$27,960
Salaries, inspectors.....	602,100	54,800	656,900	657,500		657,500
Clerk hire.....	115,700	22,800	138,500	138,500		138,500
Contingent expenses.....	160,000		160,000	160,000		160,000
Total.....	900,740	80,480	981,220	983,960		983,960
BUREAU OF NAVIGATION.						
Salaries.....	42,780	6,960	49,740	57,240		57,240
Admeasurement of vessels.....	3,760	240	4,000	4,500		4,500
Instruments for counting passengers.....	250		250	250		250
Enforcement navigation laws.....	75,000	7,200	82,200	82,200		82,200
Preventing overcrowding of passenger vessels.....	10,000	2,880	12,880	18,000		18,000
Enforcement of wireless communication laws.....	139,200	16,120	155,320	215,760		215,760
Salaries, shipping commissioners.....	30,600	1,920	32,520	38,520		38,520
Clerk hire.....	70,000	14,440	84,440	84,440		84,440
Contingent expenses.....	10,000	240	10,240	10,240		10,240
Refunding penalties, etc.....	3,000		3,000	3,000		3,000
Total.....	384,500	50,000	434,500	514,150		514,150
BUREAU OF STANDARDS.						
Salaries.....	396,500	66,080	462,580	522,760		522,760
Equipment.....	75,000		75,000	75,000		75,000
General expenses.....	48,000		48,000	48,000		48,000
Improvement and care of grounds.....	10,000	1,440	11,440	11,460		11,460
Testing structural materials.....	195,000	17,240	212,240	247,560	\$25,000	272,560
Testing machines.....	35,000	2,400	37,400	39,960	15,000	54,960
Fire-resisting properties.....	25,000	2,400	27,400	29,700	20,000	49,700
Public-utility standards.....	95,000	6,960	101,960	107,040	25,000	132,040
Testing miscellaneous materials.....	40,000	2,880	42,880	45,760	35,000	80,760
Radio communication research.....	40,000	2,880	42,880	66,040	15,000	81,040
Color standardization.....	10,000	480	10,480	10,600	10,000	20,600
Clay products.....	30,000	2,680	32,680	34,200	20,000	54,200
Mechanical appliances.....	30,000	1,680	31,680	33,000	20,000	53,000
Optical glass.....	25,000	1,680	26,680	27,380	5,000	32,380
Textiles.....	25,000	1,920	26,920	27,800	50,000	77,800
Sugar.....	40,000	1,680	41,680	42,840	25,000	67,840
Gauge standardization.....	40,000	4,080	44,080	45,220		45,220
Mine scales.....	15,000	1,200	16,200	16,500	5,000	21,500
Metallurgical research.....	40,000	3,120	43,120	44,300	35,000	79,300
High-temperature investigation.....	10,000	480	10,480	10,600	10,000	20,600
Sound investigation.....	5,000	480	5,480	10,580		10,580
Industrial research.....	150,000	10,520	160,520	188,820	85,000	273,820
Railroad scales.....	40,000	2,160	42,160	42,740	15,000	57,740
Standardization of equipment.....	100,000	3,600	103,600	156,980		156,980

COMPARISON BETWEEN THE ITEMS OF ESTIMATES FOR THE DEPARTMENT OF COMMERCE SUBMITTED FOR THE FISCAL YEAR 1925 AND APPROPRIATIONS FOR THE FISCAL YEAR 1924—Continued.

Bureau.	Appropriations, 1924.			Estimates, 1925.		
	Regular.	Bonus.	Total.	Regular.	Supplemental.	Total.
BUREAU OF STANDARDS—continued.						
Standard materials.....	\$10,000	\$720	\$10,720	\$10,840	\$5,000	\$15,840
Radioactive substances.....	10,000	1,200	11,200	11,500	10,000	21,500
Rope investigation.....	20,000	480	20,480	11,100		11,100
Power investigation.....				25,000	25,000	50,000
Physical chemistry.....				10,000	30,000	40,000
Physical constants.....					50,000	50,000
Electrical investigations.....					50,000	50,000
Additional land.....					173,117	173,117
Power plant.....					50,000	50,000
Master-scale installation.....					50,000	50,000
Total.....	1,559,500	140,440	1,699,940	1,953,280	\$58,117	2,811,397
BUREAU OF LIGHTHOUSES.						
Salaries.....	68,290	8,160	76,450	91,860		91,860
General expenses.....	4,200,000	72,000	4,272,000	4,272,000	128,000	4,400,000
Salaries of keepers.....	1,300,000	346,000	1,646,000	1,820,000		1,820,000
Salaries, lighthouse vessels.....	1,650,000	460,000	2,110,000	2,210,000	50,000	2,260,000
Salaries, lighthouse service.....	400,000	43,600	443,600	515,000		515,000
Retired pay.....	85,000		85,000	95,000		95,000
Public works.....	713,000		713,000	866,800	669,800	1,536,600
Total.....	\$,416,290	929,760	9,346,050	9,870,660	\$47,800	10,718,460
COAST AND GEODETIC SURVEY.						
Party expenses:						
Atlantic coast.....	138,000	1,920	139,920	159,920	31,080	191,000
Pacific coast.....	314,300	4,800	319,100	319,100	60,400	379,500
Tides, etc.....	29,000	420	29,420	29,000		29,000
Coast Pilot.....	5,600	360	5,960	6,560		6,560
Magnetic work.....	134,560	2,360	136,920	37,160	22,000	59,160
Federal surveys.....				126,720	106,940	233,660
Seismological work.....					23,000	23,000
Triangulation.....	15,000	210	15,210	15,000		15,000
Mississippi River.....					10,000	10,000
Hawaiian Islands.....	7,500		7,500	7,500		7,500
Special surveys.....	5,000		5,000	5,000		5,000
Objects not named.....	5,000	240	5,240	5,600		5,600
Total, party expenses.....	653,960	10,310	664,270	711,560	253,420	964,980
Repairs of vessels.....	75,000		75,000	80,000	26,000	106,000
Pay, officers and men, vessels.....	535,200	119,000	654,200	727,000		727,000
Pay, commissioned officers.....	524,005		524,005	536,219		536,219
Salaries, office force.....	291,230	43,440	334,670	402,380		402,380
General expenses.....	88,184	1,080	89,864	89,000		89,000
New vessels.....					140,000	140,000
Total.....	2,167,579	174,430	2,342,009	2,546,159	419,420	2,965,579

COMPARISON BETWEEN THE ITEMS OF ESTIMATES FOR THE DEPARTMENT OF COMMERCE SUBMITTED FOR THE FISCAL YEAR 1925 AND APPROPRIATIONS FOR THE FISCAL YEAR 1924—Continued.

Bureau.	Appropriations, 1924.			Estimates, 1925.		
	Regular.	Bonus.	Total.	Regular.	Supplemental.	Total.
BUREAU OF FISHERIES.						
Salaries.....	\$452,160	\$99,176	\$551,336	\$600,620	.....	\$600,620
Officers and crews, vessels, Alaska.....	31,630	6,240	37,870	37,870	.....	37,870
Miscellaneous expenses.....	554,020	480	554,500	576,540	\$40,000	616,540
Alaska general service.....	165,000	.....	165,000	250,000	.....	250,000
Fish hatchery, Saratoga, Wyo.....	.....	.....	.....	17,750	.....	17,750
Total.....	1,202,810	105,896	1,308,706	1,482,780	40,000	1,522,780
RECAPITULATION.						
Office of the Secretary.....	768,750	29,280	798,030	1,210,460	.....	1,210,460
Bureau of Foreign and Domestic Commerce.....	2,626,110	181,096	2,807,206	3,592,300	126,756	3,719,056
Bureau of the Census.....	1,732,340	213,815	1,946,155	1,842,600	4,000,000	5,842,600
Steamboat Inspection Service.....	900,740	80,480	981,220	983,960	.....	983,960
Bureau of Navigation.....	384,590	50,000	434,590	514,150	.....	514,150
Bureau of Standards.....	1,559,500	140,440	1,699,940	1,953,280	858,117	2,811,397
Bureau of Lighthouses.....	8,416,290	929,760	9,346,050	9,870,660	847,800	10,718,460
Coast and Geodetic Survey.....	2,167,579	174,430	2,342,009	2,546,159	419,420	2,965,579
Bureau of Fisheries.....	1,202,810	105,896	1,308,706	1,482,780	40,000	1,522,780
Reserve.....	.....	33,551	33,551	.....	.....	.....
Total.....	19,758,709	1,938,748	21,697,457	23,996,349	6,292,093	30,288,442

APPOINTMENT DIVISION.

The accompanying table shows, by bureaus, the number of permanent positions in the department on July 1, 1923, and the increase or decrease in each bureau as compared with July 1, 1922. The figures do not include temporary appointments, nor do they include the following appointments or employments not made by the head of the department: Persons engaged in rodding, chaining, recording, heliotroping, etc., in field parties of the Coast and Geodetic Survey; temporary employments in field operations of the Bureau of Fisheries; mechanics, skilled tradesmen, and laborers employed in field construction work in the Lighthouse Service. Enlisted men on vessels of the Coast Survey in the Philippine Islands and officers and men of the Navy Department employed on vessels of the Bureau of Fisheries are also excluded. The total of these excluded miscellaneous employments and enlistments is approximately 3,515, as compared with 4,022 for the fiscal year 1922. At the close of the fiscal year there were 1,042 employees in the service of the department serving under temporary appointment or employment.

The total number of permanent positions referred to in the accompanying table, together with the employments and enlistments just

mentioned, on July 1, 1923, was approximately 12,303, as compared with 12,683 on July 1, 1922.

Bureau.	Statutory.	Nonstatutory.	Total.	In District of Columbia. ¹	Outside District of Columbia.	Increase (+) or decrease (-).
Office of the Secretary.....	127	.....	127	127	.....	-56
Bureau of the Census.....	604	944	1,548	792	756	-116
Bureau of Foreign and Domestic Commerce.....	164	776	940	504	436	+345
Bureau of Standards.....	295	616	911	872	39	-57
Bureau of Fisheries.....	420	41	461	69	392	-1
Bureau of Lighthouses.....	56	5,731	5,787	40	5,747	-122
Coast and Geodetic Survey.....	325	622	947	337	610	-31
Bureau of Navigation.....	445	175	220	40	180	-10
Steamboat Inspection Service.....	269	93	362	14	348	-4
Total.....	2,305	8,998	11,303	2,795	8,508	-52

¹ Employees engaged in work in the field for a part of each year, with headquarters in Washington, are treated as within the District of Columbia.

² This increase includes the transfer from the Treasury Department, Jan. 1, 1923, by operation of law, of 121 employees of the Customs Statistics Bureau in New York, N. Y.

³ Includes the following positions, appointment to which is not made by the head of the department: 533 mechanics, skilled tradesmen, and laborers, employed in field construction work in the Lighthouse Service and work of a similar character at the General Lighthouse Depot, Staten Island, N. Y.; 1,643 lamp-lighters and light attendants, and 1,383 members of crews of vessels.

⁴ Includes two stenographers and typewriters authorized by law for not exceeding six months each during the year.

⁵ Does not include 141 positions in District of Columbia (129 statutory and 12 nonstatutory), maintenance force, transferred by operation of law, effective July 1, 1923, to the jurisdiction of the Superintendent of the State, War, and Navy Department Buildings.

SUMMARY OF CHANGES IN THE PERSONNEL OF THE DEPARTMENT FOR THE FISCAL YEAR ENDED JUNE 30, 1923.

Bureau.	Appointments. ¹						Promotions.	Reductions.
	Permanent.				Temporary.	Grand total.		
	Competitive.	Excepted.	Unclassified.	Total.				
Office of the Secretary.....	48	2	3	53	1	54	36	.....
Bureau of the Census.....	71	.....	841	912	251	1,163	80	529
Bureau of Foreign and Domestic Commerce.....	348	178	5	531	79	610	439	17
Bureau of Standards.....	178	5	33	216	94	310	477	13
Bureau of Fisheries.....	75	13	8	96	58	154	64	3
Bureau of Lighthouses.....	294	3	.....	297	118	415	587	125
Coast and Geodetic Survey.....	55	4	8	67	33	100	49	5
Bureau of Navigation.....	54	6	12	72	43	115	113	.....
Steamboat Inspection Service.....	29	.....	.....	29	2	31	17	.....
Total.....	1,152	211	910	2,273	679	2,952	1,862	692

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.

SUMMARY OF CHANGES IN THE PERSONNEL OF THE DEPARTMENT FOR THE FISCAL YEAR ENDED JUNE 30, 1923—Continued.

Bureau.	Separations. ²					Grand total.	Miscellaneous changes. ³
	From permanent positions.				From temporary positions.		
	Competitive.	Ex-cepted.	Unclas-sified.	Total.			
Office of the Secretary.....	55	2	15	72	1	73	1
Bureau of the Census.....	77		738	815	91	906	81
Bureau of Foreign and Domestic Commerce..	73	77	5	155	47	202	203
Bureau of Standards.....	194	7	30	231	83	314	63
Bureau of Fisheries.....	61	13	5	79	38	117	17
Bureau of Lighthouses.....	342	5	6	353	96	449	94
Coast and Geodetic Survey.....	36	2	16	54	29	83	29
Bureau of Navigation.....	36	59	8	103	50	153	53
Steamboat Inspection Service.....	12			12		12	8
Total.....	886	165	823	1,874	435	2,309	549

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

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

The turnover indicated by the preceding table is excessive. Twenty years ago the normal turnover varied around 5 per cent, and although it is now less than for several years past it is still a constant and expensive drain on the service and results in a serious loss in efficiency. The causes are obvious. When we see expert employees, after gaining experience in the service, leaving for better paid positions in the industrial world, when we note the constant unrest among the ambitious and efficient employees, who see little opportunity for the advancement to which they are clearly entitled, we can only assume that low compensations and discouraging outlook for the future are the underlying forces of this drain and unrest. Government employees at the statutory salaries offered are underpaid. This is emphatically so in the scientific, professional, and administrative classes, in which the turnover ranges from 50 per cent upward. Such employees are eagerly sought after by the commercial world, where the compensation is equitable and the outlook good. It is not creditable to the United States, with its reputation for wealth, to ask its employees to work for a compensation which, under the prevailing high prices and the accepted standard of living, keeps them harassed as to how to make both ends meet. An employee who is constantly under a strain with regard to financial matters can not be expected to give his best efforts to his occupation. Labor-

ers should be given a living salary. Clerical salaries below \$1,200 per annum should be abolished, and the compensation of professional, scientific, and administrative officials should equal those paid for comparable duties and responsibilities outside the Federal service. The expectation is that classification on a basis of equal compensation for similar duties will lead to a modification of the adverse conditions referred to, but whether the necessary funds will be forthcoming to make it effective is the crux of the situation.

Just as classification is anticipated to remove inadequate and discriminatory salaries, so it is expected that the establishment of efficiency ratings will give confidence to the Government employee that if his efficiency is deserving of recognition he can look forward to promotion with an approximate degree of certainty. While the department has not yet put into effect definite regulations as to the relationship between efficiency ratings and promotions, it is hoped that the classification and efficiency movement will soon be placed on a foundation sufficiently stable to permit of a fuller coordination.

Assertions are frequently made that the average Government employee gets 30 days annual and 30 days sick leave each year. A study of the following table confutes such an allegation. During the calendar year 1922 only 3 per cent of the department's employees made any approximation of doing so. In fact 31 per cent are shown to have taken no sick leave whatever. The annual average leave per employee was slightly over 28 days; sick leave less than 6 days:

Bureau.	Number.	Total.						Average, 1921.
		Annual leave.		Sick leave.		Total leave.		
		Days.	Average.	Days.	Average.	Days.	Average.	
Office of the Secretary.....	159	4,443	27.94	1,078	6.78	5,521	34.72	34.73
Bureau of the Census.....	707	20,862	29.51	4,523	6.40	25,385	35.91	35.59
Bureau of Foreign and Domestic Commerce.....	276	7,568	27.42	1,712	6.20	9,280	33.62	36.09
Bureau of Standards.....	717	19,708	27.49	3,141	4.38	22,849	31.87	33.42
Bureau of Fisheries.....	65	1,798	27.66	311	4.78	2,109	32.45	34.97
Bureau of Lighthouses.....	32	928	29.00	157	4.91	1,085	33.01	36.38
Coast and Geodetic Survey.....	203	5,725	28.20	1,350	6.65	7,075	34.85	35.24
Bureau of Navigation.....	33	869	26.33	217	6.58	1,086	32.91	37.03
Steamboat Inspection Service.....	11	321	29.18	44	4.00	365	33.18	34.11
Totals and averages.....	2,203	62,222	28.24	12,535	5.69	74,755	33.93	34.78

NOTE.—In the count of the annual leave all periods of one-half day and over were counted as a full day; periods of less than one-half day were omitted.

The classification directed under the provisions of the act approved March 4, 1923, carried on under the supervision of the Personnel Classification Board, authorized thereunder, has been given considerable attention by the department. Inconsistencies in aligning positions throughout the Government service have in the past been frequent and demoralizing, and it was recognized that one of the objects of classification would be to eliminate this want of conformity. In order to accomplish this object in the department, on receipt of the instructions of the Personnel Classification Board, a departmental classification board was organized, consisting of representatives from the Secretary's office and from each of the bureaus. This board carefully considered the classification sheet furnished for each employee of the department (excepting those of the Bureau of the Census, which, by reason of special conditions, were transmitted direct to the Personnel Classification Board), and initiated such changes as were deemed appropriate.

The continued operation of the civil service retirement act accentuates its shortcomings, to some of which I have called attention in previous reports. A modification of the original law by the act of Congress approved September 22, 1922, covers the cases of employees who have rendered the requisite service for retirement annuity, but who prior to reaching the retirement age are separated from the service through no fault of their own. Under the retirement system 111 employees of the department have been retired with an average annuity of \$551.38. Of this number only 29 received the maximum annuity of \$720 per annum. If the object of the retirement legislation is to provide for the worn-out Government employees, it is manifestly inadequate for the purpose. Another weakness in the system is the fact that the higher paid employees have to suffer the same per cent deduction as those at lower salaries, but can not receive a greater annuity. The following example illustrates this injustice: Employee A, young and ambitious, enters the service in 1920 at the age of 20 years. His average basic compensation is \$3,000. During the period of 50 years' service under present conditions he will have contributed \$3,750 toward retirement. Upon reaching the age of 70 he can receive an annuity of but \$720. B, less ambitious and efficient, enters the service in 1920 at the age of 40. He serves only 30 years at an average salary of \$1,400. During that period he will have contributed but \$1,050 to the same cause, yet he may also receive a like annuity. The higher value in money and services rendered in the former case receives no recognition whatever.

It is found that the cost of the retirement system is not as heavy as its originators anticipated, and indications are that the system may be applied with greater liberality than at present. Among the features which might be considered are retirement after 30 years of service, irrespective of age; a retirement annuity based upon length of service and average compensation and compulsory retirement at the maximum retirement age. While in some few cases retirement of experienced employees of retirement age may be detrimental to the service, the legislation permitting, under certain conditions, continuance in active service is, I am afraid, in many cases dictated by sentiment rather than by good business policy and offers opportunity for discriminatory treatment which should be eliminated.

To secure the requisite experts for certain functions organized and extended during the year it was found advisable to look outside the usual civil-service eligible registers and secure experienced industrial administratives of established reputation to take charge of these functions. The authorization of the Civil Service Commission was necessary as a preliminary, and the liberality shown by the commission in these cases is greatly appreciated. If satisfied that the department's desire was justified and that the person whose services were sought possessed the necessary special qualifications, it permitted his appointment. Such an attitude assisted the work to as great a degree as ultraconservatism would have retarded it.

DIVISION OF PUBLICATIONS.

The following table shows the expenditures for printing and binding during 1923, allotments of the appropriation for 1924, and estimates for 1925 submitted to the department by its various bureaus, offices, and services:

Bureau, office, or service.	Expenditures, 1923.	Allotments, 1924.	Estimates, 1925.
Office of the Secretary (Secretary, Assistant Secretary, Solicitor, chief clerk, and division of publications).....	\$20,017.31	\$20,000.00	\$20,000.00
Appointment division.....	920.39	900.00	900.00
Disbursing office.....	320.67	600.00	750.00
Division of supplies.....	1,429.13	1,000.00	1,500.00
Bureau of the Census.....	97,322.67	110,000.00	131,300.00
Coast and Geodetic Survey.....	35,892.07	37,000.00	42,788.40
Bureau of Fisheries.....	16,456.32	16,000.00	20,000.00
Bureau of Foreign and Domestic Commerce.....	181,442.45	161,500.00	276,100.00
Bureau of Lighthouses.....	15,764.18	16,000.00	15,280.00
Lighthouse Service.....	6,539.74	6,500.00	7,000.00
Bureau of Navigation.....	21,788.12	20,000.00	22,575.00
Shipping and Radio Services.....	5,524.15	7,000.00	9,000.00
Bureau of Standards.....	34,101.09	37,000.00	65,000.00
Office of the Supervising Inspector General, Steamboat Inspection Service.....	796.19	1,000.00	1,000.00
Steamboat Inspection Service.....	11,972.79	13,000.00	18,000.00
Customs Service.....	7,444.99	8,000.00	8,000.00
Reserve.....		6,000.00	6,000.00
Total.....	² 457,732.26	461,500.00	645,193.40
Appropriation.....	³ 463,750.00	¹ 461,500.00	

¹ 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.

² Estimated (June 30, 1923); exact figures can not be stated until all work ordered in 1923 is completed and billed.

³ Includes a deficiency appropriation of \$38,750.

The department's policy of printing most of its publications in small editions only and limiting their free distribution to certain classes, such as Government officials, Members of Congress, commercial organizations, libraries, and educational institutions, has diverted miscellaneous requests to the office of the Superintendent of Documents, who maintains a sales stock of such publications so long as there is a reasonably active demand for them. These copies are sold at a nominal price, based on the cost of reprinting from electrotype plates. This distribution not only does not involve any expense to the Government, as the amount received from sales fully covers the cost of printing additional copies, but eliminates a wastefulness usually incident to the free distribution of the maximum editions allowed by law.

The amount received from sales of the department's publications during 1922 was \$115,211.60, as compared with \$97,684.70 in 1921, an increase of \$17,526.90, or nearly 18 per cent. Figures for 1923 have not yet been compiled by the Superintendent of Documents. Coast pilots, inside route pilots, tide tables, and charts are sold by

the Coast and Geodetic Survey; other publications of the department are sold by the Superintendent of Documents.

The following statement shows the distribution of the department's publications on a sales basis for the years 1920, 1921, and 1922:

Sales.	Copies.			Receipts.		
	1920	1921	1922	1920	1921	1922
By Superintendent of Documents:						
Annual subscriptions.....	2,843,658	2,371,228	739,808	\$19,151.90	\$17,934.40	\$34,452.17
Through miscellaneous sales..	152,314	1,300,376	227,639	30,609.75	43,649.97	40,684.13
Total.....	2,995,972	2,671,604	967,447	49,761.65	61,584.37	75,136.30
By Coast and Geodetic Survey:						
Coast pilots, inside route pilots, tide, tables, and charts.....				35,902.47	36,100.33	40,075.30
Grand total.....				85,664.12	97,684.70	115,211.60

¹ Includes 120,000 copies of a series of small pamphlets known as Fisheries Economic Circulars, heretofore distributed free of charge.

² 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 preceding years.

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 ending June 30, 1923:

PURCHASES.

This office has 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 several instances surplus property in one branch of the department has been transferred to another branch of the department or Government service which required it through this office. Two boats have in this manner been obtained for the Bureau of Fisheries, one from the Shipping Board and the other from the War Department.

The chief of this division has been appointed by the Chief Coordinator, General Supply Committee, chairman of a committee to investigate the method of Government purchases of Pintsch and acetylene gases. This investigation will include transportation problems as well as those pertaining to the containers therefor.

The centralization of purchases authorized by the Secretary's letter dated June 15, 1922, was in operation during the entire fiscal year. While it has, of course, greatly increased the work along all lines of this office, it is believed that very gratifying results have been obtained and that efficient service has been given all branches of the department. This efficiency has been maintained by the very few experienced employees in the division, in spite of the handicaps incident to the change in the department's procedures and also the tremendous turnover in the personnel of the office. There are but 19 employees assigned to this division and the turnover since July 1, 1922, has been more than 100 per cent. In this connection your attention is invited to the following comparative statements showing some of the greatest increases in the work of this division due to this centralized purchasing:

Class of work.	1922	1923	Increase.
			<i>Per cent.</i>
Requisitions received.....	2,761	4,945	79.1
Proposals for services, supplies, and equipments.....	344	1,479	329.9
Invitations to bid on services, supplies, and equipment.....	1,611	6,127	280.3
Orders issued.....	4,600	10,361	120.5
Vouchers passed for settlement.....	5,211	8,145	56.0
Letters emanating from this office.....	8,185	8,733	6.6

The above work has necessitated 341 days of overtime labor by the employees of the division of supplies during the fiscal year 1923, and while it is estimated that a material saving during the current year will be made due to improved methods of handling the department's appropriation, allotments, stock, and property records, I feel assured that proper handling of the department's work assigned to this division necessitates an increase in the division's personnel, and that at least two additional clerks should be assigned to it.

FEDERAL REAL ESTATE BOARD.

The report of last year submitted by this office showed a reduction in rentals paid by this department for its field service for the fiscal year 1923 over that paid during the fiscal year 1922 as approximately \$20,000. The records of this office indicate that the depart-

ment will pay an increase during 1924 of \$8,865 over the rentals paid during the fiscal year 1923, as shown by the following report:

STATEMENT OF REAL ESTATE CHANGES, FISCAL YEAR 1924.

Service and location.	Increase.	Decrease.	Reason.
Bureau of Lighthouses:			
Ketchikan, Alaska.....	\$25		One additional room.
Portland, Me.....	450		Additional space.
Honolulu, Hawaii.....	50		Do.
Detroit, Mich.....	4,500		Moved from customhouse.
Steamboat Inspection Service:			
Galveston, Tex.....	450		Additional space.
Seattle, Wash.....		\$660	Change of quarters.
Detroit, Mich.....	3,900		Moved from customhouse.
Mobile, Ala.....		1,800	Do.
Bureau of Navigation:			
Philadelphia, Pa.....	120		Increase in rent.
Norfolk, Va.....		660	Moved to customhouse.
Bureau of Foreign and Domestic Commerce:			
Chicago, Ill.....	1,500		Additional space.
St. Louis, Mo.....	540		Do.
Total.....	11,985	3,120	
Decrease.....		3,120	
Net increase.....	8,865		
Saving of 1923 over 1922 rentals.....		20,000	
Increase during 1924 over 1923.....		8,865	
1924 saving over 1922 rentals.....		11,135	

While there is an increase in the cost of rentals over that paid for the last fiscal year, it is nevertheless true that the activities of the Federal Real Estate Board through the department's representative effected a saving of approximately \$11,135 over the rental paid by the department before the organization of the board, and the increase mentioned above has correspondingly decreased expenditures of other branches of the Government service which, in the opinion of the Federal Real Estate Board, would have been subjected to greater inconvenience in renting outside quarters than this department doing so.

CONTRACTS AND ADJUSTMENTS.

The department's board of contracts and adjustments completed their suggested forms for contracts, and these forms have been referred to the solicitor's office for opinion. That office recently requested the department board to go over these forms with their representative, which suggestion was accepted and the form for general construction work submitted by the interdepartmental board

for consideration was examined and this department's suggestions of changes have been returned to the interdepartmental board. The other forms suggested by the department board will be considered with the representative from the solicitor's office at the earliest practicable date. As soon as these forms can be approved they will be promptly submitted to the interdepartmental board for their consideration.

TRAFFIC MANAGER.

The following is a statistical report of the traffic manager's office for the fiscal year ended June 30, 1923:

Bureau.	Shipments.			
	Less carloads.	Carloads.	Total.	Total tonnage.
	Number.	Number.	Number.	Pounds.
Coast and Geodetic Survey	641	10	651	891,984
Division of supplies	300	2	302	263,452
Stock and shipping	631	.....	631	156,124
Bureau of Lighthouses	4,857	144	5,001	10,693,759
Bureau of Fisheries	884	43	927	8,795,654
Steamboat Inspection Service	3	.....	3	252
Bureau of the Census	93	.....	93	7,602
Bureau of Navigation	16	.....	16	2,040
Bureau of Foreign and Domestic Commerce	28	.....	28	7,366
Bureau of Standards	1,104	14	1,118	871,188
Total	8,557	213	8,770	21,689,421

Bureau.	Freight.	Express.	Parcel post.	On bill of lading, freight and express.	Not on bill of lading.			
					Freight.	Express.	Parcel post.	Total.
	Pounds.	Pounds.	Pounds.	Number.	Number.	Number.	Number.	Number.
Coast and Geodetic Survey	826,757	64,991	236	627	11	.....	13	24
Division of supplies	258,252	5,200	.....	302	.....	.....	.....	.....
Stock and shipping	146,995	7,549	1,580	549	.....	.....	82	82
Bureau of Lighthouses	10,603,300	43,211	47,248	2,191	54	11	2,745	2,810
Bureau of Fisheries	8,667,399	128,167	88	880	7	38	2	47
Steamboat Inspection Service	102	150	.....	3	.....	.....	.....	.....
Bureau of the Census	4,638	2,964	.....	91	.....	2	.....	2
Bureau of Navigation	1,210	830	.....	16	.....	.....	.....	.....
Bureau of Foreign and Domestic Commerce	6,280	1,086	.....	27	.....	1	.....	1
Bureau of Standards	837,395	29,949	3,844	554	3	7	554	564
Total	21,352,328	284,097	52,996	5,240	75	59	3,396	3,530

¹ Division of supplies made 10,306 purchases and only 302 of them purchased f. o. b. point of origin. However, the department paid the freight charges in the price of goods on the 10,004 purchases.

NOTE.—Sleeping, parlor car, and steamship reservations, 1,048; sets of proposals considered, 252; letters written, 2,456; and routing orders obtained from Federal Traffic Board, 154.

DEPARTMENT LIBRARY.

The department's library, which is the depository and center for assembling all available data bearing upon the work of the department, is becoming more valuable each year, and is one of the most useful and important units of the department. It contains more than 100,000 books and pamphlets, and has long been recognized as the most complete statistical library of the Government. It contains a wealth of material to enable the research worker to study foreign countries and their needs, as well as domestic conditions. Use of the library during the past year has been the largest in its history, and, though undermanned in its personnel, the fact that the work was satisfactorily handled indicates the exertion and spirit of the staff.

Eight hundred research workers from other Government departments, establishments, and business men used the library during the year.

During the year 1,790 bound volumes and 1,373 pamphlets were added; 3,288 books were catalogued; 14,636 cards were added to the catalogue trays; 715 books were sent to the bindery; 1,885 weekly, monthly, and quarterly periodicals, 99 different daily papers, and 57 foreign official gazettes were currently received, recorded, and routed upon receipt to 2,077 individuals or divisions; and 872 books were borrowed from the Library of Congress and other libraries. The library has prepared lists of books on various subjects for research workers and lists of periodicals currently received.

A system has been devised by the library for routing periodicals whereby they are not returned to the library until all persons on the list have examined them and yet enables the librarian at all times to locate any particular periodical. By this system a limited number of periodicals are made to efficiently serve a large number of individuals.

In January, 1923, a branch library was installed in the Bureau of the Census, which is housed in a building $1\frac{1}{2}$ miles distant from the department proper. Its use has greatly improved the service to that bureau and has more than justified its installation.

OFFICE OF THE SOLICITOR.

During the fiscal year ended June 30, 1923, 162 contracts, totaling \$912,940.41, together with 12 contracts of indeterminate amounts; 75 leases, amounting to \$80,080.98; 21 revocable licenses, amounting to \$874; 18 deeds, involving the sum of \$13,712; 87 contract bonds, amounting to \$216,674.22; and 71 official bonds, amounting to \$392,000, were examined (approved, disapproved, drafted, redrafted, or modified).

The number of legal opinions rendered, formal and informal (memorandum), totaled 269; legislative matters handled which concern the Department of Commerce (drafting and redrafting of bills, reports relative thereto, etc.) numbered 27. Power of attorney cards, authorizing agents to execute official and contract bonds for surety companies, examined, totaled 1,895. In addition, 1,513 miscellaneous matters, embracing everything submitted for the advice or suggestion of the solicitor, or for the formulation of departmental action, not including in the foregoing items, were handled by this office.

Very truly yours,

E. W. LIBBEY,
Chief Clerk and Superintendent.

BUREAU OF THE CENSUS.

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
Washington, July 1, 1923.

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:

No other bureau is required by law to work under such pressure for a period of three years to bring a great work to final conclusion on a given date and immediately thereafter resume normal activity with a greatly reduced force working under a greatly reduced per capita compensation. During the year the bureau has been undergoing the readjustments incident to this violent change which occurred on July 1, 1922. While the completed copy for all of the Fourteenth Census reports was sent to the Government Printing Office before the close of the year 1922, as required by law, necessarily the proof for these reports had to be read and revised during 1923. Unfortunately there has been such a congestion of work in the Government Printing Office that it was impossible to print all of the census reports during the year, and on July 1, 1923, there still remain five quarto volumes, including the Abstract, that have not been printed.

In addition to the verification of the proof of the reports of the Fourteenth Census, the bureau has during the year carried on its regular investigations pertaining to births and deaths; finances of States and cities; manufactures; production, distribution, and consumption of cotton, cottonseed and cottonseed products; tobacco stocks; electrical industries; wealth, debt, and taxation; institutional population; and marriage and divorce. Special inquiries were also made concerning animal and vegetable fats and oils; hides, skins, and leather; boots and shoes; active and idle wool machinery; activity in the cotton-spinning industry; manufacture and sale of farm equipment; clay and refractory products; glues and gelatins of animal origin; lighting fixtures; paints and varnishes; sulphuric acid and acid phosphate used in the fertilizer industry; wool consumed by manufacturers; wool stocks; commercial stocks of coal;

production, orders, and stocks of hosiery; sales and distribution of mechanical stokers; wheat ground and wheat-milling products; men's and boys' ready-to-wear clothing, garments cut; production, orders, and shipments of malleable castings; leather gloves and mittens; work clothing; cast-iron pipe; and sugar statistics. The Survey of Current Business, which aims to be a reliable index of current business conditions, has been issued each month and a number of special detailed technical tabulations have been made to obtain statistics required by other bureaus, independent commissions, and associations.

The statistics of population are now shown with greater detail than ever before. There is no other country that collects such detailed information concerning its people. The use of census data as a guide for legislation to regulate immigration, naturalization, sanitation, and other subjects has forced the bureau to extend its work in many directions. Its activities have been so greatly extended that it is impossible to cover all the subjects at the same time, and Congress has wisely provided for a rotation of work so that certain distinctive investigations shall be made at certain periods in the time intervening between the decennial censuses.

WEALTH, PUBLIC DEBT, AND TAXATION, 1922.

The bureau compiles decennially statistics showing the wealth of the Nation as indicated by the estimated value of real and personal property; also the total revenue, public debt, assessed valuation of real and personal property, tax levies, and tax rate.

The statistics for taxes and other specified revenues cover every political civil division having the power to collect revenues, including the Federal Government, States, counties, cities of all sizes, townships, school districts, and drainage districts, etc., whereas the prior report was limited to the Federal, State, and county governments, and the governments of incorporated places with a population of 2,500 and over. The report will also contain complete statistics for the public debt for all subdivisions having the power to incur debt. In addition, it will show the assessed valuation of real estate, the amount of tax levies, and the tax rates.

In order to secure this information it was necessary to make inquiry, either by mail or by personal visit, of all the various political divisions, numbering about 60,000 in all. The plans for the collection of the statistics through the mail and by the agents in the field were made prior to January 1, 1923, and the enumeration was completed by June 30, 1923. Although this census is broader in scope than any heretofore made, the field work has been finished at a much earlier date and at a much less expenditure than at any pre-

ceding enumeration. The preliminary reports are now being issued and it is expected by the close of this calendar year to have the result of the inquiry published. This will make the data public more than a year earlier than those for the last census, 1912, were published. This result has been attained by careful preparation, the extensive use of the mail, and a reorganization of the field force.

The reports for 1922 will cover the following subjects: Public debt (tax-exempt securities); assessed valuation and tax levies; specified revenues; digest of laws relating to taxation and revenues; estimated national wealth; and abstract of the five reports.

The report on public debt will contain detailed statistics for the Federal Government, for all the States, counties, cities, and other minor civil divisions, so that the rate of increase and the amount of issue can be studied for the different sections of the country, and the different classes of government.

TAX-EXEMPT BONDS.

While in some States a considerable proportion of this material was secured at the State capitol, in many instances it was necessary to go directly to the places, and the absence of complete records and the use of antiquated accounting systems have added materially to the cost of the work.

DIGEST OF LAWS RELATING TO TAXATION AND REVENUE.

To insure a complete canvass it was necessary to make, in advance, a careful study and digest of the taxation and revenue laws of all the States. This digest will shortly be issued as one section of the report, and a considerable portion of the manuscript has already been sent to the printer. This will be the only up-to-date report covering the entire subject, and we expect it to satisfy the urgent demand for definite information concerning the tax legislation of the States and local governments.

NATIONAL WEALTH.

To complete the balance sheet of the Nation, the bureau is preparing an estimate of the true value of all tangible property, real and personal, in continental United States, and, so far as possible, in the outlying possessions, including both taxed and exempt property held by governments and by private corporations, associations, partnerships, and individuals.

REAL PROPERTY EXEMPT FROM TAXATION.

An estimate is being prepared of the value of all real property exempt from taxation. Primarily it consists of the value of real property and improvements thereon belonging to the Federal Government and States, counties, cities, towns, villages, school districts, other districts organized as public corporations, and certain properties held under private ownership. These properties, classified as to use, are devoted to educational, agricultural, religious, fraternal and benevolent, correctional, charitable, curative, protective, and defensive purposes, including also public utilities, general administration buildings, and such miscellaneous properties as cemeteries, fish hatcheries and game farms, Indian reservations, and in certain States reforested lands.

FINANCIAL STATISTICS OF STATE AND CITY GOVERNMENTS.

The financial statistics of States and cities compiled annually include the total and per capita receipt from revenues; total and per capita payments for expenses, interest, and outlays; total and per capita indebtedness; estimated true value and assessed valuation of property; and taxes levied, rates, methods of assessment, and other financial matter. Descriptions of accounting terminology and suggestions for uniform classification are also included.

These annual reports, which have been compiled by the Bureau of the Census since 1902, constitute a valuable statistical history of the income, expenditures, methods of taxation, and practically all financial data of the States and cities, showing the changes that are taking place in the total and per capita transactions.

INSTITUTIONAL POPULATION.

INMATES OF INSTITUTIONS.

The institutional population of the United States on January 1, 1923, was about 1,000,000, and a much larger number are taken care of for varying periods during each year. A special census of this element of our population is taken every tenth year, and the rapid increase in the numbers committed to the institutions for the insane, feeble-minded, epileptics, and juvenile delinquents to almshouses, prisons, reformatories, jails, and workhouses, institutions and societies for the care and protection of children, institutions for adults or both adults and children, and other institutions for defective, dependent, or delinquent classes emphasizes the importance of the data. Fully two-thirds of the institutions covered by the census are supported by the Federal, State, county, or city governments, and the

increase in the number of inmates necessarily adds to the governmental expenditures.

The enumeration was made not only to ascertain the number of men, women, and children committed to the institutions, but also to obtain facts concerning the causes of commitment and other information that might assist in the prevention of crime and a reduction in the numbers cared for by the governments. Since the last census there have been numerous laws enacted regulating the establishment and maintenance of institutions, and many improvements have been made in their management. The increasing interest in this subject is evinced by the organization of associations, the establishment of governmental boards and committees, and the number of individuals who devote their time to the study of institutions and to devising ways and means for reducing the numbers committed; also by the improvement in the methods followed in the conduct of institutions in general. Naturally, there was greater interest attached to this census than to any previous enumeration, and the bureau was fortunate in securing the cooperation and assistance of the organizations and individuals associated with the different classes of institutions. The reports show for the inmates of most of the institutions the sex, age, marital condition, race, nationality, and numerous other facts that will furnish the basis for a close and instructive analysis of the social problems involved.

CARE OF CHILDREN.

We have found it more difficult to collect satisfactory statistics concerning the institutions for the care of children, adults, or both adults and children, than for any other of the various classes of institutions covered by this inquiry. There is no authentic list of these institutions, and in many localities there is apparently no law or local ordinance governing their operations. They appear to be organized and abandoned without special authorization of any character. The bureau has canvassed every known source of information in order to prepare a complete list of the institutions of this class. An extensive mail canvass was in operation for several months, and it was supplemented by the use of special agents in the field.

Not only was it difficult to obtain the list of these institutions, but in many cases there was apparently no satisfactory record made of the children committed and their disposition. It was felt that in many respects this branch of the investigation was of the greatest importance, and every effort has been made to compile complete and satisfactory statistics. It is regretted, however, that local laws and ordinances have apparently not been formulated to require these institutions to keep proper records of their transactions.

CRIMINAL STATISTICS.

It is hoped that the census will be of material assistance in studying the causes of crime and in establishing preventive measures. With these ends in view the bureau conferred with persons who are especially interested in the subject and formulated schedules which they thought would result in securing the essential information. The statistics cover Federal and State prisons and reformatories, county and city jails and workhouses, convict camps, and chain gangs. There was very little difficulty in securing satisfactory statistics concerning Federal and State penitentiaries, but in many States there are no satisfactory records concerning the commitments to county and city jails or to convict camps and chain gangs.

As a preliminary to the regular census, an investigation was made during July, 1922, to ascertain the number of persons in confinement on July 1, 1922, as compared with July 1, 1917. This inquiry was conducted almost entirely by mail and telegraph. The preliminary press summary giving the results for the United States was issued November 22, 1922, and the detailed report, in bulletin form, was published April 14, 1923.

ELECTRICAL INDUSTRIES.

The canvass for the collection of data concerning the operations of central electric light and power stations, electric railways, telephones, and telegraphs was started promptly with the beginning of the calendar year 1923. The field work was practically finished by the close of the fiscal year, and we hope to publish the results before January 1, 1924, thus making another record in the completion of a big investigation. Peculiar importance is attached to this inquiry, as the results will be used at the World Power Conference to be held in London, England, during next July. The figures will show the increase, during the last five years, in the use of electricity in the United States for light, power, and other purposes.

It is regretted that the appropriations for this inquiry have never been sufficient to enable the bureau to collect data concerning the operations of isolated light and power stations. While the isolated stations are not engaged in the production of electricity for sale, and are operated primarily for the benefit of the activity with which they are connected, such as hotels, factories, mines, mercantile establishments, vessels, private residences, etc., many of them are very large, and have a much greater kilowatt capacity than many of the central stations that are covered by the census. There are undoubtedly a greater number of these isolated plants than there are commercial stations, and their inclusion in the census would add greatly to the value of the statistics.

BIENNIAL CENSUS OF MANUFACTURES.

The passage of the law requiring a census of manufactures to be taken biennially made it necessary to reorganize entirely the work and make radical changes in the scope of that census and in the methods of enumeration and tabulation, as well as in the style of the printed reports. Heretofore it has required from 18 months to 2 years to secure satisfactory reports from all establishments covered by the quinquennial census of manufactures. Manifestly, to take a census every second year it would be necessary to shorten materially the time devoted to field work; otherwise it would be impossible to publish the results of an enumeration before beginning work on the next, and before many years the results would become confused and be of no practical value.

The first enumeration under the new law (act of March 3, 1919) covered the year 1921. While the bureau was still overburdened with the work incident to the Fourteenth Census, it was necessary to start at once with the reorganization. This was accomplished by the following methods:

(1) By instituting a campaign to demonstrate to manufacturers the value of industrial statistics, both current and historical. This was necessary because the great delay in taking the census was due largely to the neglect of manufacturers to make their reports. Many requests had to be made by mail and telegraph, and then by personal visit of an agent; and in many cases the agent had to wait for several days before he could secure the report. This delay added greatly to the expense of the work and detracted from the value of the statistics. The campaign required considerable time and persistent effort; in fact, it is still in progress and must be continued indefinitely. The technical press and organizations of manufacturers have been of great service to the bureau in this respect.

(2) It was also necessary to confer with manufacturers, organizations, and the technical press with regard to the inquiries to be included in the schedules. This required considerable time, but resulted in a material reduction in the number of inquiries and the formulation of a schedule which was more nearly in harmony with the practical business methods of manufacturers.

(3) The number of establishments to be canvassed had to be materially reduced; otherwise the cost of the work would have been prohibitive and the delay in the publication would nullify the results. The organizations and technical press naturally desired to have reports secured from all establishments, both large and small. At the census of 1919 there were 65,485 establishments reported, each with products valued at less than \$5,000. These establishments formed 22.6 per cent of the total number, but they gave employment

to only 0.5 per cent of the wage earners, and their products formed only 0.3 per cent of the total value of products. Their inclusion increased the expense of the enumeration by about 25 per cent, while the data for them added but little, if any, to the economic value of the results. However, in order not to make, at the start, too radical a departure from accepted census methods, a short form schedule relating to average number of wage earners and total value of products was adopted for the establishments with an annual production amounting to less than \$5,000. The results of the enumeration of 1921 have demonstrated the wisdom of omitting from the biennial census of manufactures all establishments of this size, and this practice will be followed for 1923.

By resorting to the methods indicated and making some changes in practices, the field work for the census of 1921 was completed in the main before July 1, 1922. This is a record never before attained in taking the industrial census, but I hope we shall still further reduce the time as the manufacturers become acquainted with the value of the statistics and accustomed to preparing the biennial reports.

The census of 1919 covered a year of industrial prosperity, while that of 1921 covered a period of unusual business depression. Therefore, a comparison of the figures for the two years fails to indicate variations during periods of normalcy, but emphasizes the necessity of collecting data at more frequent intervals. This necessity is being met by the collection of monthly statistics on current business and industrial transactions as described below (p. 85).

VITAL STATISTICS.

The collection and compilation of vital statistics is one of the most important of the regular annual inquiries conducted by the Bureau of the Census. For more than 20 years the bureau has been urging the adoption by State governments of adequate legislation for the registration of births and deaths; and as the States enact such legislation and give satisfactory evidence of proper enforcement they are included in the Federal registration area. Largely through the efforts of the Bureau of the Census the death registration area has grown from 10 States and the District of Columbia in 1900, comprising 40 per cent of the total population of the United States, to 38 States, the District of Columbia, and 14 cities in nonregistration States in 1923, comprising 87 per cent of the total population. The birth registration area, established in 1915, has grown from 10 States and the District of Columbia in that year, with 31 per cent of the total population, to 30 States and the District of Columbia in 1923,

with 72 per cent of the total population. Admission of a State to the area, however, does not necessarily mean its permanent retention. If a State repeals its good laws, or if State officials become lax, it may be necessary to drop a State from the area. The Bureau of the Census must, therefore, be constantly on the alert for backsliders and retest the States from time to time. In the past year three States were retested and happily all showed good registration.

We have also prepared a new edition of the Physicians' Pocket Reference to the International List of Causes of Death and a new Manual of International List of Causes of Death, both based on the last revision of the International List, which was made in 1920. Preliminary work has also been started on new editions of the Standard Nomenclature of Diseases and Pathological Conditions, Injuries, and Poisonings for the United States and on the Index of Joint Causes of Death.

The bureau has published 21 annual reports, giving detailed mortality statistics, 6 annual reports giving detailed birth statistics, and 2 volumes of life tables showing expectation of life and related data for the population of certain States.

The annual birth report shows for the registration area and for the States and cities included number of births by sex, color, and month of occurrence, births of white children by country of birth of father and mother, total deaths, births per 100 deaths, birth and infant mortality rates, deaths from important causes for the 12 subdivisions of the first year of life, and other statistical details.

The annual mortality reports show for the States and cities which constitute the registration area number of deaths by month of occurrence, sex, color, nativity, parent nativity, age, and cause, and many mortality rates.

The continued demand for authentic death rates for the last decade gives full assurance that the special compilation, now in press, of *Mortality Rates, 1910-1920*, will prove of very great value.

The Weekly Health Index, which has been published by the Census Bureau since 1917, now gives mortality statistics for 72 cities. These cities report weekly the total number of deaths and the number of deaths of children under 1 year of age, and these data are published with death rates and infant mortality rates.

FOREST PRODUCTS.

The collection and compilation of annual statistics for lumber, lath, and shingles, and pulp-wood consumption were continued during the fiscal year 1923 in cooperation with the Forest Service. The cooperative agreement provides that certain employees of the Forest Service should be appointed special agents of the Bureau of the

Census for the purpose of collecting reports and adjusting discrepancies and errors before forwarding the reports to the Bureau of the Census. This arrangement has proved to be economical, because in many of the Western States the manufacturing plants are widely scattered, and the cost of the field work has heretofore been unusually high per establishment.

The National Lumber Manufacturers' Association and the American Hardwood Manufacturers' Association have cooperated with the bureau in every way possible in the collection of these data.

MARRIAGE AND DIVORCE.

The statistics of marriages and divorces collected by the Bureau of the Census now cover 42 calendar years, but there have been varying periods of intermission in the work, so that the results do not form a continuous and satisfactory history of this feature of our social life. The first investigation covered the period from 1867 to 1886; the second, the period from 1887 to 1906; a third covered the calendar year 1916; and the present investigation the year 1922. It is hoped that the inquiry can be carried on annually hereafter, as such an arrangement will be much less expensive and in every respect more satisfactory than occasional compilations.

An increasing number of States are compiling annual statistics concerning divorces, and at this enumeration the reports were obtained from State records for 10 States and the District of Columbia. In all other States it was necessary to secure the data from county records, and some county official was employed at a fixed compensation of from 10 to 25 cents for each divorce satisfactorily reported. By resorting to these methods it was possible to make a satisfactory canvass at a comparatively slight expense.

The importance of publishing annually statistics concerning the number of marriages and divorces is emphasized not only by the great increase in the actual number of divorces granted each year but also by the increase in the number per 100,000 population. In 1906 there were only 84 divorces granted to every 100,000 population; in 1916 they had increased to 112 and in 1922 to 133 per 100,000 population. The actual number of divorces granted in the United States increased from 9,937 in 1867 to about 145,000 in 1922. The fact that the State governments are assembling statistics concerning divorces is another indication of the importance attached to this subject.

STOCKS OF LEAF TOBACCO.

During the year four reports were published showing quantities of leaf tobacco held by manufacturers and dealers. These reports, which are required by the acts of Congress approved April 30, 1912,

and May 10, 1916, present data of leaf tobacco held on the 1st day of July and October, 1922, and January and April, 1923.

COTTON AND COTTONSEED.

The regular inquiries in regard to cotton and cottonseed were conducted by the bureau during the year. There are 10 reports relating to cotton ginned to specified dates during the ginning season; 12 published monthly during the year giving cotton consumed, imported, exported, and on hand, and active consuming cotton spindles; 12 published monthly relating to activity in the cotton-spinning industry showing the number of cotton-spinning spindles in place, the number of active spindle hours, and the average number of active spindle hours per spindle in place; 12 published monthly giving cottonseed received, crushed, and on hand, and of cottonseed products manufactured, shipped out, and on hand; an annual bulletin on cotton production and distribution for the season; and an annual pamphlet giving the statistics of cotton ginned from the crop of the past year.

The cooperation which the bureau has received from the ginneries and establishments from which the statistics are collected has increased year by year and reports are now secured promptly from all concerned.

INDUSTRIAL AND BUSINESS STATISTICS.

The development of statistics to show current transactions in industry and business has been an important feature of the work of the bureau during the past two years. This is a new departure, and the work has had to be coordinated with other activities in such a manner as to cause the least additional expense and not interfere with the orderly progress of other work. Prior to July, 1921, the only statistics of this character collected by the bureau related to the production, consumption, and stocks of cotton, stocks of tobacco, and the consumption and stocks of animal and vegetable oils and fats. By the close of the year this service had been extended so as to show for nearly all the principal basic commodities the monthly production, stocks, unfilled orders, sales, prices, imports, and exports, and also such business indicators as bank clearings, freight carried, business failures, and other factors usually considered in determining the policies to be followed in business transactions. Some of the figures are furnished directly by the individual establishments to the bureau. Others are supplied by 90 trade associations and similar organizations, by 34 technical periodicals, and in addition figures on 111 subjects are taken from publications of 51 Federal, local, and foreign Governments. The material is arranged in convenient form for ready reference and published in the monthly

Survey of Current Business, advance statements being distributed to the subscribers to this journal. The circulation of the journal has continued to increase during the year and on July 1 consisted of 5,435 paid subscribers, 1,300 newspapers and trade associations, and 650 representatives of the United States consular service, commercial attachés, and other representatives of the Department of Commerce.

The cooperative arrangement with trade associations for the wider dissemination of statistics has been broadened during the year to include a number of new industries. On the other hand, a few trade associations have discontinued their statistical work in favor of a wider inquiry which the Bureau of the Census started, with the cooperation of the whole industry. In the case of associations the membership of which did not represent all of the manufacturers involved, the bureau has extended the inquiry so as to cover all or substantially all of the establishments, thus perfecting the statistics and making them more representative.

Many expressions of the usefulness of the Survey of Current Business continue to come from business men. It has apparently won a place of its own as an indispensable guide to the business man who wants the facts set forth and summarized in their proper relationship. In making available to the Survey of Current Business their valuable data on various business movements, trade associations and private organizations have greatly enhanced the value of this work, and the assistance of all these organizations is hereby gratefully acknowledged.

ANNUAL, SEMI-ANNUAL, QUARTERLY, AND MONTHLY INQUIRIES.

Statistics for various industries are collected for different periods, depending upon the requirements of the laws and the demands of the industry, as shown by the following statement:

- Beet and cane sugar production and refining, including sales and stocks (monthly).
- Boots and shoes, production of (monthly).
- Cast-iron pipe (monthly).
- Clay and refractory products (annual).
- Coal, commercial stocks (published at irregular intervals).
- Cotton, production, as shown by reports of ginneries at 11 specified dates during the ginning season and at the end of the season.
- Cotton, consumption (monthly).
- Cotton, stocks at the end of each month.
- Cotton, stocks for the entire work (annual).
- Cotton spindles, active (monthly).
- Cotton spindle hours, active (monthly).
- Cottonseed, crushed (monthly).
- Cottonseed products produced (monthly).
- Cottonseed stocks at the end of each month.
- Farm equipment, manufacture and sale (annual).

Fats and oils (quarterly).
Glues and gelatines of animal origin (annual).
Harness, leather, skivers, and sole and belting leather (monthly).
Hides, skins, and leather (monthly).
Hosiery, production, orders, and stocks (monthly).
Leather gloves and mittens (monthly).
Lighting fixtures, manufacture of (annual).
Lumber, laths, and shingles (annual).
Malleable castings, production, orders, and shipments (monthly).
Mechanical stokers, sales and distribution (monthly).
Men's and boys' ready-to-wear clothing, garments cut (monthly).
Paint and varnish, statistics of production (semiannual).
Pulp-wood, consumption of (annual).
Pyroxylin-coated textiles (monthly).
Rubberized cloth (monthly).
Sulphuric acid and acid phosphate used in the manufacture of fertilizers, production (semiannual).
Sulphuric acid and acid phosphate used in the manufacture of fertilizers, stocks on hand (semiannual).
Tobacco, stocks held by manufacturers (quarterly).
Turpentine and rosin, production and stocks (annual).
Vitreous sanitary china pottery (monthly).
Wheat ground and wheat-milling products (monthly).
Wool consumed by manufacturers (monthly).
Wool stocks (quarterly).
Work clothing (monthly).

There has been a continuous demand from the business community as a whole for the extension of the collection of data for the principal industries, and the above list indicates the extent to which the work has developed.

LEATHER STATISTICS.

In accordance with the act of Congress approved June 5, 1920, monthly reports were issued during the year showing the production and stocks of leather, the production of boots and shoes, and the stocks of hides and skins. In order to meet the requirements of the industry, advance mimeographed reports on certain features of the leather industry were issued at regular intervals. A number of persons engaged in the industry felt that it would make these reports more valuable if the data were extended to include statistics of unfilled orders by tanners and by manufacturers of shoes; also the stocks of boots and shoes in process of manufacture, and the stocks of boots and shoes in the hands of shoe manufacturers, wholesalers, and jobbers. But after conferring with representatives of the industry it was decided that the present was not an opportune time for the extension of the statistics in this manner.

STATISTICAL ATLAS.

This volume, which has been in preparation during the year, contains all of the charts, diagrams, and maps used in presenting the statistics for the different branches of the census.

The first Statistical Atlas issued in connection with the Federal census was published at the completion of the census of 1870 and was prepared under the supervision of Gen. Francis A. Walker, superintendent of census. After each of the subsequent censuses a similar volume has been issued. The atlas of 1880, however, although prepared by officials connected with the Census Bureau, was published by Charles Scribner's Sons, as the census appropriation was exhausted. In 1890, 1900, and 1910 the Statistical Atlas was published as one of the census volumes. It contains all of the charts, diagrams, and maps that were used in illustrating the census volumes and, in addition, a number of maps and charts that were prepared especially for this publication. There has always been a great demand for it on the part of educators, map makers, and statisticians. The preparation of the atlas has necessarily been delayed until after the completion of the census reports. The Statistical Atlas of the Fourteenth Census will be ready for publication during the year 1923.

OFFICIAL REGISTER, 1923.

This register of the names of the employees in the executive and legislative branches of the Government has been printed biennially since 1816, and since 1906 it has been compiled by the Bureau of the Census, in accordance with the provision of an act of Congress of June 7 of that year. In order to comply with the law the report for 1923 must be published by December 1 of this year. It involves considerable work, and a number of clerks have been employed on it for several months. In addition to the information heretofore collected, the Civil Service Commission requested certain data which they considered essential for their purposes in making reports to the Commissioner of Pensions, as required by the retirement act of May 22, 1920. In view of its great importance I agreed to secure this additional information, and accordingly five new inquiries were added to the card, namely: Year of birth, sex, total years of military service, total years of other service, deductions made for retirement fund. The size of the card which has heretofore been used was not increased, and it is believed that little additional time will be required by the individuals or officials in making the returns, which obtained in this way will save the expense of an independent and costly inquiry. The work of securing the reports is now in progress, and it is expected to complete it before this report is published.

When the cards have been used as copy for the printing of the Official Register they will be released to the Civil Service Commission, which is arranging to tabulate the answer to their inquiries. The commission is planning to use our perfected tabulating equipment for tabulating the data, reimbursing the bureau for all expenses incident to the work required.

MONOGRAPHS OF THE FOURTEENTH CENSUS.

Satisfactory progress is being made on the series of interpretative studies or monographs referred to in my previous annual report, the purpose of which, as I explained, is to meet the need for an adequate analysis and interpretation of census figures in relation to live questions of the day. The monograph already published on Increase of population in the United States, 1910-1920, which was prepared by W. S. Rossiter, of Concord, N. H., has attracted much attention and received many favorable notices in newspapers and magazines. Extended extracts have been reprinted and the subject matter has furnished the basis for numerous newspaper editorials and articles.

ESTIMATES OF POPULATION.

In my last annual report I referred to the great demand for estimates of the population not only for the United States as a whole but also for the different States, cities, and counties, and the different elements of the population in the years intervening between decennial census years, and I described the method of preparing these estimates. During the year we completed the tables giving the estimates for all political divisions, which it is the intention to include; the copy has been sent to the printer, and the bulletin will shortly be ready for distribution. Press notices were issued during the year giving the estimates for the States and the principal cities, and upon request the estimates were furnished for any political subdivision desired.

The bureau has been criticized for issuing these estimates of population. Some cities contend that they do not show actual conditions and that other methods could be used that would be more satisfactory. The census advisory committee and other authorities have been consulted and other methods have been considered, but it has been decided that the purpose of the estimates is best met by the method now in use.

SPECIAL CENSUSES OF POPULATION.

The statistics of population are used in some States to fix the salaries of county and city officials or to regulate special tax assessments. For example, in Illinois if the population of an incorporated place as shown by the Federal census is less than 2,500 the State road

when passing through the city must be constructed and maintained at the expense of the State, but if the population exceeds 2,500 the work must be done by the city. The population of Fairbury, Ill., is a case in point. It had a population at the Fourteenth Census of 2,532. As a State road was to be constructed through the city, special interest was attached to the statistics of population. It was thought by some of the citizens that there had been a slight decrease in the population since the enumeration in January, 1920, and they petitioned the bureau to make another enumeration. A special census was accordingly taken as of August 14, 1922, and it was found that on that date the population was 2,390.

In some localities the population increases so rapidly that special enumerations are necessary in order to obtain totals that convey a correct idea of actual conditions. The population of High Point, N. C., increased so rapidly that the mayor of High Point requested that a special census be taken of that city. Accordingly an experienced employee of the bureau was designated as supervisor, and the census was taken as of March 26, 1923, when 18 enumerators began work. The work was finished and the totals made public on April 7. A formal request for a special census of the population of Greensboro, N. C., was also made by the mayor on March 24, 1923. Upon the completion of the work in High Point the office representative proceeded to Greensboro and arranged to take the census of that city as of April 16, 1923. The work began on that day with 32 enumerators and was completed on April 28.

TABULATIONS.

Most of the tabulation work is done by the punch-card system, cards being passed through electrically driven tally machines and tabulators. These machines have been greatly improved within the last two years and the field of their operation materially extended. They are invented and constructed in the bureau, and therefore are owned by the Government. It is my conviction that they could and should be used by other departments, and that appropriation should be made to enable the construction of a sufficient number to do all of the tabulation work where the card system can be used to advantage.

The utility of the census tabulating machines has been demonstrated by the various special detail tabulations that have been made by them during the year. These tabulations were made in cooperation with other bureaus, or to supply information desired by individuals or organizations, the bureau being reimbursed for the cost of the service.

LISTS OF ILLITERATES.

State superintendents of public instruction, departments of education, and other State bureaus, as well as organizations, such as State universities and the Federation of Women's Clubs, and individuals have during the past two years instituted a campaign of education. The publication of statistics concerning the number of illiterates reported for the Fourteenth Census, as well as the investigations on this subject, directed attention to the fact that the records of the Bureau of the Census contained the names and addresses of all persons reported as illiterate. Numerous requests were received for lists giving these names and addresses. Unfortunately there was no appropriation available from which to meet the expense of preparing these lists; but several States appropriated money for this purpose and employed a considerable force of clerks in the bureau copying the names and addresses from the census reports. Numerous lists were also furnished educational institutions and other organizations in a large number of States, and the cost of this work was met by the persons for whom the lists were prepared. It is believed that the lists have been of material assistance in this campaign.

PRESERVATION OF RECORDS.

Congress having authorized the use of \$30,000 of the amount appropriated for the collection of statistics to bind and put in proper shape the valuable records of the bureau, the work was started as quickly as possible. These records, which are being used constantly for reference, have been neglected for many years and were in very bad condition. The schedules had to be placed in proper order and arranged for binding before they were sent to the Government Printing Office, and this work required 22 clerks for about eight months. During the year there were 7,962 volumes bound and 994 rebound. The volumes vary in size from 18 inches long, 14 inches wide, and 2 $\frac{3}{4}$ inches thick, to 25 inches long, 18 inches wide, and 2 $\frac{1}{2}$ inches thick. There are now a total of 14,695 bound volumes in the collection, requiring 5,100 feet of shelving. In addition to the bound volumes of the census schedules, there are 9,161 bundles of the family schedules used at the census of 1890. These schedules occupy approximately 1,950 linear feet of shelving. The remainder of the schedules of 1890 that were not destroyed during the fire in the Commerce Building are now stored in such a manner that they are not available for reference. All of the census records that are in any condition for reference are now in the Census Building, and are more conveniently arranged and in better condition than they have been at any time before in the history of the bureau.

During the year the records were in constant demand, and 2,970 searches were made of them for genealogical data, information to prove the birth and age of individuals, for criminal cases in court in which the age of the person is of paramount importance, data to establish pension and other claims, data to assist in the settlement of estates, and information for various other purposes. These records are also in constant use to establish the ages of children so they can obtain certificates that will enable them to engage in gainful occupations in certain States. About 4,000 letters were sent out during the year furnishing special information requested from these records.

The population schedules giving the personal data for each individual are the only records preserved indefinitely, and these now increase so rapidly at each census that it will be impracticable to retain them unless some better arrangement is made for their care. All the other records—reports of manufacturers, farms, electrical industries, deaths, births, etc.—are retained for a short time and then destroyed.

DUPLICATION IN STATISTICAL WORK.

Following your instructions, we have, before undertaking to collect data for any industry, made careful inquiry to ascertain if any other branch of the Federal Government is engaged in similar work, so that, while our activities have been extended, no duplication has developed. Other bureaus have cooperated with us to avoid duplication, and two or three current inquiries have been turned over to the Census Bureau because it was already collecting the same or similar statistics. On the other hand, we have discontinued certain work because it paralleled investigations being made by other offices. If these methods are persisted in, they should finally result in a greater unification of the nonadministrative statistical work of the Government.

Technically there is very little duplication now going on, but manufacturers and others think there is duplication because two or more Government offices call on them for reports on related subjects. For example, the Bureau of Labor Statistics collects monthly statistics concerning the number employed and the rates of pay in representative establishments; the Bureau of the Census collects biennially data of the number employed during the entire year in all establishments and the total amounts paid in wages. The Geological Survey collects statistics concerning the quantity and value of stone quarried, while the Bureau of the Census procures information biennially in regard to the cutting and polishing of the products of the quarries. The Bureau of Chemistry, of the Depart-

ment of Agriculture, secures reports of stocks of turpentine and rosin on hand at distributing ports and in domestic consuming industries; the Bureau of the Census collects annually statistics of production and stocks in the hands of producers. The United States Tariff Commission takes an annual census of the production of dyes and other synthetic organic chemicals; this industry is also covered by the biennial census of manufactures.

Of course, the same apparent duplication would exist if the work were concentrated in one bureau. In that event, however, the inquiries would all be made by the same office, which would thus eliminate some of the confusion that now exists. On the other hand, it is contended that the specialists in the Geological Survey, the Bureau of Labor Statistics, the Bureau of Chemistry, the Federal Reserve Board, and other branches of the Federal service are better qualified to collect the statistics they require than are the statistical experts in the Bureau of the Census, and that their statistical work is of assistance to them in their other activities. Nevertheless, the condition leads to complaints similar to the following:

"For quite a period of years we have been furnishing some department of the Government information regarding prices. We believe it is the Department of Agriculture. We never failed to make the reports, and on account of our having furnished this information to that department for so long we feel that it would be better if you would get this information now from some other firm."

"We like to be accommodating on all these reports, but as we are now making the same kind of reports to Atlanta and Louisville government agents hope they will suffice."

"We believe it is entirely a duplication of effort, as the same information is being assembled and distributed by the Federal reserve bank, and that is being practically duplicated by the Federal Trade Commission."

"We could see but slight difference in the value of the material secured by these returns, and to be fair to all we gave up making all returns."

CENSUS OF AGRICULTURE IN 1925.

Section 31 of the act approved March 3, 1919, provides—

That there shall be in the year 1925, and once every 10 years thereafter, a census of agriculture and livestock, which 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.

To comply with this requirement it was necessary to prepare estimates for the Budget for 1925. The census will cover the calendar year 1924 and active field work must begin promptly with January, 1925. It is important that all preliminary arrangements be perfected so the canvass can be finished rapidly and the figures published in time to be of greatest value. Accordingly, a committee was appointed, consisting of representatives of the Department of Agricul-

ture and the Department of Commerce, to decide upon the forms to be used and the methods to be followed in taking the census. This committee has had several meetings and substantial progress has been made.

MAIL.

The total pieces of mail sent out from the bureau during the fiscal year 1923 amounted to 3,593,584. Of this amount, 3,488,565 represented circular matter—that is, press summaries, schedules, questionnaires, and letters pertaining thereto—and 105,019 represented the general correspondence of the bureau.

ECONOMIES.

The establishment of the Budget has brought home to the officials of the bureau the necessity of giving careful attention to details. Advantage has been taken of every opportunity to economize where economy would not seriously affect the value of the work. The principal economies have been effected by a reorganization of the field force so as to reduce the number of agents required to collect data necessary for the various enumerations that were in progress during the year. This reorganization has effected a saving of approximately \$110,000 as compared with the cost of the same investigations during previous years. A reorganization has also been effected in the tabulation methods followed by the bureau, all of the machine work being brought under the same control in one division. The cost-accounting system of the bureau has been centralized and the number of persons engaged upon it materially reduced. The style of the publications has been changed, reducing the size of the volume from quarto to octavo.

SALARY SCALE.

The salaries in the Bureau of the Census have always been low as compared with other bureaus of the Government service, and the small increases provided during the decennial-census period, which did not begin to cover the loyal and efficient service rendered by the officials and other employees receiving them, should have been retained for the bureau under the permanent organization. Apparently acting on the assumption that these increases were intended for the rush work of the decennial period only, drastic cuts in salaries were made under the appropriation for the past fiscal year, thus making it necessary to reduce the compensation of 466 employees on the permanent roll and 166 on the temporary roll, the reductions affecting all classes of employees from the officials down to the subclerical force.

It was impossible under these circumstances to retain many of the young and capable employees who were needed to build up our force and who had received intensive training in census work and methods during the decennial period. Moreover, some of our older and best-equipped experts and other employees who had remained during the decennial-census period on the assumption that they would retain the salaries they were then receiving, or secure better ones, became discouraged and left the service. To meet this situation partially it became necessary for the bureau to appoint temporary clerks, some of whom remained only a brief time, the salaries being too low to hold those who were eligible for appointment on the permanent roll, while others (trained decennial-census clerks) were not eligible under the civil-service rules for permanent appointment.

The cost to the bureau of this turnover since the reorganization, which represents 24 per cent of its total force, can scarcely be measured. From the standpoint of the Government service as a whole, there is, of course, a mitigating feature in that while the Census Bureau has suffered other bureaus and departments have benefited by being able to add trained census clerks to their forces. But as the Bureau of the Census does not exist for the purpose of acting as a training school for employees the condition is one that can scarcely be borne with equanimity. It is to be hoped that under the reclassification act the greatest statistical bureau in the world will be provided with salaries sufficiently attractive to enable it to keep the experts and other employees now on its rolls and to fill future vacancies by the appointment of men and women who have qualified at various universities and colleges along economic and statistical lines.

DISTRIBUTION OF INFORMATION.

The methods followed in giving publicity to census data have been changed in many important respects. To be of greatest service, the data must be distributed immediately upon the completion of the totals. Some of the figures are compiled from telegraph reports and the totals given to newspaper representatives and mailed to correspondents throughout the country.

The system has also a great advantage in enabling the bureau to issue press announcements or short summaries of data on various subjects, which are printed widely in newspapers throughout the country, thus enabling the public to become familiar with valuable statistics heretofore buried in the large volumes. I note with gratification the very satisfactory results of my efforts to place these data before the public with the least possible delay through the medium of press announcements, and many letters have been received congratulating the bureau on this service.

A substantial result of this dissemination of census statistics by the press has been a broadening interest by the public in all features of census work and a growing knowledge of Federal activities, as shown by the rapidly increasing volume and diversified character of the bureau's correspondence.

During the year ended June 30, 1923, 746 press summaries, with a total edition of 1,671,525, were issued.

In addition to these press announcements, statistical statements on business conditions were prepared each week in connection with the Survey of Current Business and sent to the United States Chamber of Commerce for distribution to its membership list of about 25,000; and 28 statements of domestic business conditions were prepared and sent out to newspapers, and also broadcasted by radio.

CHANGE IN SIZE OF REPORTS AND WEIGHT OF PAPER.

The size and bulk of census reports has been a subject of frequent discussion and considerable criticism; and a result was the publication of an abstract of the census in octavo form (6 by 9 inches), designed for the use of the general public who may not have access to the main volumes, and containing all the statistical matter required for ordinary use. An Abstract of the Census of Manufactures for 1914 was published in the same form, this volume taking the place of the large octavo report formerly issued. The octavo form has proved so popular that I have planned to have all future publications of the Census Bureau prepared for printing in this size, where the change will not require the omission of valuable comparative figures. The first complete set of reports to be issued in this size will be that of the Census of Manufactures for 1921, now going through the press. A further feature of the Fourteenth Census reports was the use of a thin, but substantial, paper, which greatly reduced the bulk and weight of the volumes.

RECOMMENDATIONS FOR CHANGES IN CENSUS LAWS.

The law authorizing the collection and publication of statistics of cotton ginned to specified dates was first enacted March 6, 1902, and reenacted July 22, 1912. It provides that the first report concerning the quantity of cotton ginned shall relate to September 1, the second to September 25, and the third to October 18. Since the law was first enacted there has been considerable change in the quantity of cotton ginned during the first part of the season. A much larger proportion of the crop is now ginned prior to November 1 than formerly, and it is believed that the requirements of the industry would be best served if the dates to which the respective reports are to be made should be changed in order to bring the data more closely into alignment with

the industrial requirements. To accomplish this, section 2 of the act of July 22, 1912, should be amended to read as follows:

SEC. 2. That the statistics of the quantity of cotton ginned shall show the quantity ginned for each crop prior to September 1, September 16, October 1, October 16, November 1, November 16, December 1, December 16, January 16, and March 1, and shall be published as soon as possible after these respective dates. The quantity of cotton consumed in manufacturing establishments, the quantity of baled cotton on hand, the number of active consuming cotton spindles, the number of active spindle hours, and the statistics of cotton imported and exported shall relate to each calendar month, and shall be published as soon as possible after the close of the month * * *.

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 last year, it is impossible to collect complete data of this character under present conditions. I therefore renew my recommendation that legislation on this subject as outlined in my last report be enacted.

That portion of the act of July 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, should be repealed. This legislation was enacted in order to ascertain the quantity of cotton used in the manufacture of explosives, etc., because of the great activity of these industries during the World War. The necessity for the statistics has now passed.

STOCKS OF LEAF TOBACCO.

In previous reports I have 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 the forms somewhat could obtain all of the information concerning stocks of leaf tobacco now collected by the Bureau of the Census, thus avoiding duplication and the necessity of the same concern reporting to two bureaus. Further, 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 at the close of the four quarters of the preceding calendar year. It is impossible for the bureau to comply literally with the requirements of this law; however, if the work is to be continued by the Bureau of the Census, I recommend that the law be amended so as to require the bureau to obtain reports from all registered tobacco dealers, irrespective of their size. It is also recommended that this law be

amended so as to permit the reports to be sworn to before postmasters and assistant postmasters. This amendment would save considerable time and expense on the part of the persons required to make the affidavit.

OFFICIAL REGISTER.

Since 1907 the Bureau of the Census, as required by law, has compiled and published biennially a volume giving the names of and information concerning all the civilian employees of the Federal Government, except those in the Postal Service. It seems to me that it answers no important purpose; certainly its value does not justify the expenditure of \$50,000, the approximate cost of its preparation and publication.

I accordingly recommend that a law be passed discontinuing the preparation of the Official Register after the publication of the edition for July 1, 1923, and authorizing the compilation and publication biennially by the Bureau of the Census of statistics of the civilian personnel of the Federal Government.

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, 1923.

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, 1923. The bureau has expanded steadily and consistently—entering new fields of activity, amplifying those services already established, and supplying with greater effectiveness the needs of the American business community for commercial data.

The bureau has felt that during the past year, when there has been a gratifying increase in the domestic demand for commodities, it has been especially essential to conduct a vigorous campaign for the maintaining of persistent effort in the export field. Too many manufacturers are prone to neglect their foreign connections during periods of prosperity at home, and such a policy is likely to result in incalculable harm, forfeiting the position previously built up and alienating (perhaps permanently) the agents and merchants abroad. The bureau has endeavored to prevent such untoward developments by strengthening its service and constantly directing the attention of American business men to the advantages of unremitting exertion in the foreign markets.

The system of commodity divisions established during the preceding fiscal year has proved eminently successful. Several new divisions have been created, and the work of the existing commodity divisions has been systematized and developed, enabling them to respond even more satisfactorily to the requirements of the industries they serve.

The establishment of several new permanent foreign offices, the increasingly close supervision exercised over such offices, and the correlation of their work by such means as the Rome conference of attachés and trade commissioners have given renewed energy to the entire foreign service of the bureau and have made possible the achievement of the notable results that are mentioned specifically in succeeding pages.

Especially significant was the beginning of the special investigations into supplies of certain raw materials and the markets for

American agricultural products. These studies promise to be enlightening and of very great and definite value to some of the most important of American industries.

The details of these and many other bureau activities are presented in the various sections that follow.

CHANGES AMONG BUREAU EXECUTIVES.

With the assignment abroad of Leland Rex Robinson, Robert A. Jackson was appointed assistant director of the bureau, entering upon duty February 7, 1923. The three other assistant director positions continued to be filled by O. P. Hopkins, Louis Domeratzky, and Thomas R. Taylor.

Arthur S. Hillyer was appointed as chief of the commercial intelligence division. On October 14, 1922, Harold Dotterer succeeded Norman Meese as chief of the division of district offices, Mr. Meese becoming assistant chief of the foreign service division, of which Walter L. Miller was made chief. John Matthews, jr., was appointed chief of the paper division on August 1, 1922, succeeding Grosvenor M. Jones, assigned to duty as chief of the newly created finance and investment division. Henry C. Campbell was made acting chief of the research division on October 26, 1922, succeeding George B. Roorbach. Charles C. Concannon was appointed chief of the new chemical division. Harry A. Curtis was placed at the head of the nitrogen work and Louis F. Crossette of the sisal work. Frank Surface has charge of the world survey of agricultural products undertaken by the bureau. At the beginning of the fiscal year the previously existing fuel division was divided into a petroleum division and a coal division, with Henry C. Morris as chief of the former and Francis R. Wadleigh of the latter.

Between June 30, 1922, and June 30, 1923, the number of persons on the rolls increased from 522 to 935, or nearly 80 per cent. By authority of an act of January 5, 1923, 122 persons in New York, N. Y., were transferred from the Treasury Department to the bureau's roster as the section of customs statistics.

COMMODITY DIVISIONS.

FUNCTIONS AND SERVICES COMMON TO ALL COMMODITY DIVISIONS.

Each of the bureau's 17 commodity divisions has supplied material for a special section in Commerce Reports, the weekly magazine of the department; has distributed numerous special circulars; has prepared articles for trade journals; has sent out data on trade opportunities; has increased the number of names on the bureau's Exporters' Index; has prepared questionnaires to be answered by

Government representatives abroad; and has 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 department's new Commerce Yearbook.

AGRICULTURAL IMPLEMENTS DIVISION.

George B. Bell continued as chief of the agricultural implements division, and George F. Kendall became assistant chief September 15, 1922. Close relations were maintained with the National Association of Farm Equipment Manufacturers. The division has conducted much research work and has satisfied many requests for direction and advice concerning foreign markets. To give a single example, it laid out a plan (since successfully carried out) for introducing pumps into Brazil. General articles published in Commerce Reports have included discussions of markets in the Philippine Islands, Switzerland, Chile, Australia, Sweden, Mexico, Haiti, Netherlands East Indies, Italy, Portugal, Algeria, and Esthonia. Numerous other important articles have been supplied by the division.

The outstanding achievement of the division has been a survey of the markets for pumps and farm lighting equipment throughout the world. This has aroused keen interest and has brought about satisfactory concrete results. A similar questionnaire on windmills was distributed. A study was made of the production of agricultural implements and machinery in the United Kingdom, Belgium, Sweden, Czechoslovakia, the Netherlands, Germany, and Italy. Trade information bulletins included Agricultural Implements in the Netherlands East Indies and British Malaya, Sale of Agricultural Implements in Foreign Countries, and Japan as a Market for American Agricultural Implements and Machinery. It is planned to make during the fiscal year 1924 surveys covering spraying apparatus, dairy equipment, poultry equipment, and possibly other classes. Another project to be carried out is the survey of the production of implements in Australia.

AUTOMOTIVE DIVISION.

Gordon Lee resigned as chief of the automotive division December 15, 1922, to accept a position in the industry, and M. H. Hoepfli has been acting chief since that time. A reorganization of the division was effected. Inquiries answered by the bureau on automotive subjects increased from 17,700 in 1922 to more than 55,000 in 1923. In a great many instances specific service by the division produced tangible results in the form of sales made or agencies established. With the aid of the division of commercial laws a number of claims

were amicably adjusted. Trade associations and leading manufacturers have recognized the division as one of the foremost sources of automotive foreign-trade information. The Department of Commerce cooperated with the Bureau of Mines in the preparation of several motion-picture films illustrating automotive methods and products. Some of these films have been extensively and effectively demonstrated in foreign countries. The automotive division has supplied foreign offices of the Departments of Commerce and State with considerable educational material.

Mr. Lee and Mr. Hoepfli delivered numerous addresses before trade bodies. Reports were made to the foreign-trade committees of the automotive associations cooperating with the division, whose work the associations unanimously indorsed. An increasing number of trade lists have been sent to manufacturers. Two weekly press statements, called the Automotive Press Digest and the Automotive World News, go to about 150 trade papers, besides a large number of newspapers. There is also a weekly Line Digest, with a circulation of 1,800 copies.

The results of a 10-month investigation of the Far Eastern automotive markets by Trade Commissioner William I. Irvine were embodied in the publications *Japan as an Automotive Market* and *Automotive Markets in China, British Malaya, and Chosen*. A more general review of the Argentine market, by Trade Commissioner George S. Brady, was published in the form of a trade information bulletin. Toward the close of the fiscal year an extensive investigation of India as a market for automotive products was completed by Trade Commissioner C. C. Batchelder. Simultaneously two trade information bulletins, covering the foreign markets for taxicabs and taximeters and for motor fire-fighting equipment, were prepared by the division on the basis of returns to a world-wide survey by means of questionnaires. The following monographs were prepared in the course of the year on the basis of information available in the division: *Automotive Conditions in Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, and Central America*.

The division instituted world surveys, including revision of world census for automotive vehicles, corrected to January 1, 1923; foreign markets for motor fire-fighting equipment, taxicabs, mechanical tire-inflation equipment, accessories, parts, and equipment, motor cycles, marine engines and motor boats, and aircraft; preferences concerning passenger cars and motor trucks; automotive selling season; quarterly sales survey, combined with a forecast of automotive market conditions.

Plans have been made and activities started for expanding the work along these lines: (1) Reclassification of Exporters' Index; (2) market analysis; (3) merchandising investigations; (4) for-

eign trade manual. The division has taken full charge of the foreign trade manual service, which work was initiated by the National Automotive Chamber of Commerce and contributed to by the department during the previous year. The manual will cover, for about 100 countries, the following subjects: Basic factors; business practices; current conditions; laws and regulations; manufacturing; trade lists; markets for accessories, aircraft, motor boats and marine engines, motor cycles, trucks, parts, passenger cars, and servicing equipment.

CHEMICAL DIVISION.

The chemical division was established August 1, 1923, with C. R. De Long as chief. Mr. De Long resigned October 31, 1922, and his assistant, C. C. Concannon, is now chief. There has been mutual assistance and valuable cooperation between the division and the trade and export associations in the chemical industry. Articles have been published in Commerce Reports relative to market situations in 26 chemical commodity groups and specific chemicals in about 40 foreign countries. Analyses of the United States export trade in chemicals and allied products are frequently published, as well as import analyses from time to time. There has been a steadily increasing number of business inquiries, most of these being of a type demanding considerable research work. Approximately once a month an article is prepared analyzing the American export trade in the principal commodities. The division has given assistance to American dye manufacturers. It placed in operation a method by which import figures for all dyes and synthetic organic chemicals coming into the United States through the port of New York could be furnished to the industry very soon after the close of each month. The industry regards this as an outstanding service.

On May 9, 1923, F. E. Breithut was appointed chemical trade commissioner to Europe. Interested persons have been supplied with all available information on China wood oil. Active steps were taken to locate supplies of white arsenic abroad. An extensive survey was made of the use of pyroxylin paints.

A monthly cable is received from the commercial attaché at Berlin giving German domestic quotations on various dyes and chemicals. Export statistics by countries have been distributed for soda ash, soda bicarbonate, sal soda, caustic soda, and bleach. Work is now going forward on a world survey of paints and of "biologicals" and "medicinals." Further constructive programs are in contemplation.

COAL DIVISION.

From the beginning of the fiscal year July 1, 1922, practically the entire work of the coal division was in connection with the emergency distribution of coal and related matters. At this time the

miners' strike was at its height, with the result that no coal was being exported from this country except small quantities to Canada. This work was continued until the end of the strike, September 11. On September 22, F. R. Wadleigh, chief of the coal division, was appointed assistant to the Federal fuel distributor, and the entire force of the division was transferred to that office. Mr. Wadleigh continued, however, to handle the work of the coal division, H. C. Morris being appointed acting chief for official purposes. On January 1 Mr. Wadleigh was appointed Federal fuel distributor, but he has continued to handle all coal-division matters.

ELECTRICAL EQUIPMENT DIVISION.

Compilation of data on all central power stations of the world being in usable shape and nearly completed, special efforts were devoted toward developing better selling outlets abroad for American electrical goods. Information was gathered concerning foreign engineers, manufacturers' agents, importing firms, and electrical dealers. Special efforts were made to obtain the names of young manufacturers' agents just starting in business who would be capable of representing American firms on efficient terms. As a phase of this work, and to obtain a more intimate knowledge of possible European competition, R. A. Lundquist, chief of the division, made a short trip into Sweden, Germany, and England early in the fiscal year. He also secured information concerning the possibilities for the sale of electrical household appliances in England and northern Europe.

A special study of radio was made by S. H. Day, assistant chief, and a trade information bulletin on that subject was issued. Classified lists of American radio manufacturers were prepared.

A revised edition of the Electrical Glossary was brought out by the division. Many statistical statements have been issued showing American exports as well as imports into foreign markets by countries of origin.

The division has secured and sent to manufacturers a considerable number of specifications for electrical goods issued in foreign countries. As typical of this work there may be cited the distribution of several different sets of specifications and forms for bidding covering material for the huge Morwell project in Australia.

Progress has been made in obtaining data as to electrical standards and construction requirements of foreign countries. Close contact has been maintained with the Electrical Manufacturers' Association, and the division has also been in touch with a committee selected by manufacturers of telephone equipment and with two societies for electrical development.

FOODSTUFFS DIVISION.

The work undertaken in cooperation with the National Cannery Association, which included a complete survey of foreign food laws and regulations affecting imported products, has been almost completed. Arrangements have been made for the establishment of a tobacco section July 1, 1923. Analyses of international trade in vegetable oils over a period of years have been completed. The Meat Packers' Institute has been kept informed of foreign economic conditions. Assistance was given to a national cocoa and chocolate manufacturers' association, and the division cooperated with certain of the large fresh-fruit and casein companies. Among the publications prepared in the division were: World Markets for American Dried and Dehydrated Fruits and Vegetables, World Trade in Vegetable Oils, Foreign Demand for American Malted Milk, World Production and Trade in Figs and Dates, Manufactured Milk Industry and Trade of the World, Latin American and Canadian Markets for Canned Goods.

More than 70 special inquiries have been carried out, through questionnaires and requests to foreign representatives of the Government. The subjects of these inquiries have been extremely varied. To give only three examples out of many, there were investigations of the methods of packing anchovies in France, Spain, Italy, Norway, and Sweden; markets for dried fruits in Chosen, the Philippines, Siam, and the Straits Settlements; and the production and consumption of tobacco in China.

Alfred P. Dennis, who acts as special representative of the foodstuffs division in Europe, has made a large number of reports on the foodstuffs situation and crop conditions.

A staff of seven special research clerks has been established in the division. In cooperation with the statistical division a wire service has been established announcing weekly the exports of grain and flour and shipments of Canadian grains through United States ports. The statistical analyses of the sugar, cotton, and grain trades throughout the world have been brought up to date and much improved. There have been three regular weekly press bulletins, Foodstuffs 'Round the World, Foreign Notes on Meats, Fats, Oils, and Livestock, and World Trade and Crop Notes. As news of particular and immediate importance reaches the division from abroad it is frequently released to the press at once. During the year 95 such reports were placed in the hands of Washington correspondents and press associations, often within a few hours after receipt.

E. G. Montgomery has continued as chief of the foodstuffs division.

HIDE AND LEATHER DIVISION.

The work of the hide and leather division has shown rapid development, its services having more than trebled. A series of articles was published on the important foreign tanning materials used in the United States. There was a survey of resources of domestic raw tanning materials and the production and consumption of domestic tanning extracts. A study of world hide and skin production and movement was undertaken, as was an investigation of the international trade and local consumption of the principal producing countries. The division has been studying the ways of securing more standardized methods in the flaying, curing, and grading of foreign hides and skins that come to this country. This is regarded as a most important problem. There has been a study of the take-off, curing, and merchandising of reindeer skins, of which there is an increasing study in Alaska. Special studies have been made of the increase in tanning production and capacity in Brazil, Argentina, Chile, Great Britain, and France, and similar studies are being made in all the important leather-producing countries. In cooperation with the transportation division practical remedies for theft and pilferage have been worked out.

Through the valuable assistance of the Salvage and Surplus Stocks Bureau of the War Department the division has kept the industry informed as to the inventories, reductions in stock, and proposed auctions of leather and manufactured leather goods. Data have been collected relating to the work being carried on in foreign countries by leather research laboratories. Much information has been supplied to the American Sole and Belting Leather Tanners (Inc.). There has been hearty cooperation with other Government bureaus. Two very valuable trade information bulletins were issued, one on Leather Industry and Trade of the Netherlands and the other on Italy's Leather Market. A survey of the leather industry of the United Kingdom was prepared. A bibliography of the tanning industry was compiled. Wilbur J. Page has continued as chief of this division.

INDUSTRIAL MACHINERY DIVISION.

There has been a very great increase in the amount of work performed by the machinery division. Between June, 1922, and June, 1923, the number of inquiries answered by the bureau on machinery matters more than trebled. A special survey has been made of the machinery dealers of the world by collecting reports showing the qualifications, facilities, and limitations of the dealers in all foreign cities. Efforts have been made to revise the export classification now used in connection with statistics of machinery exports and certain

improvements have been instituted. The division is arranging for the entire revision of the index showing the kinds of machinery produced by various American manufacturers. A number of special studies have been made, including statistical analyses of the world's trade in metal-working machinery, ice and refrigerating machinery, woodworking machinery, flour-mill equipment, and other articles. A survey of the highway-construction programs in all foreign countries, a similar survey of the ice and refrigerating plants of the world, and a number of other tasks of like character have been accomplished. The division has aided American machinery manufacturers in a great variety of ways, especially in the adjustment of disputes. It has facilitated negotiations with officials of foreign governments on many subjects. Walter H. Rastall is chief of this division.

IRON AND STEEL DIVISION.

The iron and steel division has pointed out some of the weak spots in the conduct of American export trade and has recommended correctives. It has urged manufacturers to seek export trade when business at home is good. Promising markets were indicated. The attention of the industry was called to the disadvantages resulting from the necessity of transshipping goods in foreign bottoms in order to reach certain foreign ports. There was an extraordinary growth in the number of inquiries answered. A steel exporters' index was started and grew rapidly. The chief of the division, Luther Becker, made frequent visits to the leading centers. A world-wide investigation of the market for industrial structural steel buildings was carried out. Data involving the manufacture abroad of iron, steel, and copper wire were collected. An investigation was made in European countries to ascertain the character and extent of "redevelopment" work in sheet and pressed metal. Other studies concerned wire rope, special steels, roofing materials, forgings, steel castings, sprocket chain, etc. The division has been instrumental in selecting proper foreign agencies for American manufacturers. Important statistical statements have been issued monthly. Every important foreign construction project has been investigated, and American steel men have been kept informed of progress. Trade information bulletins were issued on such subjects as German Iron and Steel Industry, Areas of Steel-Plant Concentration in Great Britain, and Market for Construction Materials in Brazil. Articles were contributed to trade publications and the press.

Contact has been established with 51 trade associations having to do with iron and steel and their products.

At the beginning of the fiscal year a mineral section, with James A. Stader at its head, was organized as an integral part of the division,

to take over its activities in connection with minerals and nonferrous metals. Many reports resulting from studies of foreign mineral deposits were distributed. Trade information bulletins issued by the section comprised World Trade in Cement, Fire-Brick Markets in Latin America, Austrian Magnesite Industry, Fluorspar Resources of the World, and Grecian Emery. A plan has been initiated for a register of American importers of minerals. The section has linked up American buyers with foreign suppliers of raw products. Cooperation with trade associations was effected from the outset.

LUMBER DIVISION.

The outstanding achievement of the lumber division, of which Axel H. Oxholm is chief, has been the compilation of a series of reports on Methods of Handling Lumber Imports Abroad, obtained by means of a questionnaire to consuls and Department of Commerce representatives. A large amount of statistical data was added by the lumber division to show the United States exports to each country and the imports of each country from all sources. The reports have been issued in a series of trade information bulletins covering, respectively, South America, North America outside of the United States, Africa, Australasia, Asia, United Kingdom and northern Europe, western continental Europe, and southern and eastern Europe.

The lumber division has secured complete up-to-date lists of lumber agents and importers in all important foreign markets. It has also compiled information on arbitration practice in foreign lumber markets, together with lists of arbitration courts. The division has listed 1,160 exporters of lumber and lumber products on its Exporters' Index, and during the year it secured from most of these firms a detailed statement of the precise character of their exports. The division has built up a file of foreign agents of American lumber exporters and has recommended reliable connections in various cases. There was issued the Directory of Exporters of American Lumber and Wood Products, giving details of the business of about 1,500 firms. Another publication in the miscellaneous series was Stave Trade in Foreign Countries. Trade information bulletins included Parana Pine Lumber Industry of Brazil, Export Timbers of the Philippines, and Lumber in Austria and Italy. A pamphlet on Grade Marking of Lumber was prepared for and published by the National Lumber Manufacturers' Association.

Questionnaires were sent out covering such subjects as foreign markets for cooperage stocks, box shooks, and railway ties. An average of more than 125 business problems and questions pertaining to the export of lumber are handled each week by the lumber division, many of these involving much research work.

The chief of the division made recommendations concerning reforestation before the Senate Forestry Committee.

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. Foreign statistics also have been compiled and interpreted. Tables were issued covering the conversion of Petrograd standards and of cubic meters into American board feet.

In May, 1923, the industry formed a lumber advisory committee to cooperate with the division, and its advice has proved valuable.

Mr. Oxholm, chief of the division, plans to sail early in July for a comprehensive 15-months investigation of the lumber markets of the Netherlands, Belgium, France, and Switzerland.

PAPER DIVISION.

The paper division was reorganized at the beginning of the fiscal year, and on August 1, 1922, John Matthews, jr., was appointed chief. There was a marked increase in the amount of work performed, the outgoing correspondence for the year totaling 2,680 communications in answer to inquiries. Two hundred items were prepared for Commerce Reports, and most of these were reprinted in trade journals. The division also prepared for various outside publications original articles on the exportation of paper.

The bureau's monthly statistical statements on exports of paper were enlarged to include certain grades that had not previously been covered, and the mailing lists were revised so that all concerns interested would receive the statements as issued.

The principal work of the year was a survey of the most promising foreign markets for paper. These reports will be published as trade information bulletins, one of which, Market for Paper and Paper Products in Brazil, has already gone to press.

In conjunction with the commercial intelligence division, lists of foreign importers and dealers have been checked up and revised. Advice has been given to numerous concerns as to which of the foreign markets are likely to prove most fertile fields for direct personal solicitation. Others have been given the names of suitable agents abroad. Through a survey conducted under the supervision of the division, the manufacturers of a special composing machine were furnished with information enabling them to conduct a world-wide sales campaign.

PETROLEUM DIVISION.

Henry C. Morris remained as chief and H. F. Fox as assistant chief of the petroleum division when the former fuel division was divided at the beginning of the fiscal year. The division has ob-

tained much new data and is increasing its understanding of the problems of the exporting companies, mainly as a result of the information furnished the division concerning the specific petroleum products shipped by the individual companies and the countries to which they are exported. The special country lists enable the division to distribute data most expeditiously and effectively.

The foreign representatives of this Government have supplied a wealth of detail as to marketing conditions, foreign competition, etc. Trade information bulletins were issued on the petroleum trade and industry of the United Kingdom, France, Spain, Argentina, and the Netherlands East Indies. Press statements have been distributed giving brief summaries of some of the more valuable reports which it was impracticable to disseminate generally in their complete form. There was a steady service in statistics of production and distribution of petroleum products in foreign countries.

The division has started a file of current petroleum legislation in the various producing or prospective oil areas of the world. This file is currently complete for all South and Central American countries, and the work of preparing copies of the petroleum laws of other countries is progressing favorably.

The compilation of data on which to base a comprehensive study of price trends abroad is well started and regular distribution of this information has begun. Special studies of the world's supply and consumption of individual petroleum products are being made. The division is preparing a list of the various designations under which petroleum products are shipped abroad, so that there may be an agreement upon the export classifications.

RUBBER DIVISION.

The work of the rubber division with respect to the crude-rubber situation is indicated in the section entitled "Investigation of raw materials." The investigation of European markets for rubber goods begun by P. L. Palmerton, chief of the division, in April, 1923, enriched the informational files of the division and led to the publication of various special circulars and of trade information bulletins on the Market for Rubber Products in the United Kingdom and the Market for Rubber Products in Belgium. A third bulletin was a reprint of the report of a British committee appointed to advise on measures to alleviate the serious crude-rubber situation in British possessions. A very large number of mimeographed circulars has been issued. Twelve of the division's export handbooks on foreign rubber-goods markets were issued during the past year, bringing the total to 45. Preliminary work on seven others has been completed.

The preparation of rubber-goods tariff schedules and trade lists of foreign importers has proceeded satisfactorily; thus far complete tariff schedules on 40 foreign countries have been issued and kept up to date and 468 trade lists have been distributed.

The division has continued the issuance of advance statements showing monthly, semiannual, and annual exports of various rubber products, by countries of destination. As a result of a questionnaire, the division has been able to advise American tire companies concerning price conditions throughout the world. Cabled data have strengthened this service. Information on tire-distribution methods and trade practices has also been given out. A preliminary survey of foreign markets for canvas rubber-soled footwear has been made.

The chief of the division has made several trips in the United States conferring with persons in the rubber industry. There has been close contact between the division and the Rubber Association of America.

SHOE AND LEATHER MANUFACTURES DIVISION.

The activities of the shoe and leather manufactures division, of which A. B. Butman is chief, increased threefold during the year, with no increase in personnel. A questionnaire was sent out covering production, consumption, competition, etc., in foreign countries, and the information thus obtained from Government representatives abroad has been given to the trade in a variety of ways.

The division obtained data from American manufacturers as to the kind of goods manufactured, whether or not these were exported, the principal countries of destination, and whether or not the firm was listed on the bureau's Exporters' Index or maintained a foreign agency. The names of about 200 manufacturers were added to the index.

The chief of the division held conferences in Boston, Philadelphia, New York City, Rochester, Gloversville, Brockton, Chicago, Sandusky, and Washington. Many persons inspected the bureau's material and were informed of its services. There has been cordial cooperation with the National Boot and Shoe Manufacturers' Association, the New England Shoe and Leather Association, the National Association of Leather Glove Manufacturers, and the Wholesale Saddlery Association. In addition, the division has cooperated with the Chamber of Commerce of the United States, the War Department, the Census Bureau, the Tariff Commission, the Senate Finance Committee, the Ways and Means Committee, several of the foreign embassies and legations, and various Members of Congress.

SPECIALTIES DIVISION.

The specialties division, of which Henry H. Morse is chief, promotes the sale abroad of more than 40 groups of commodities. One important phase of its work has been the grounding of the small manufacturer, inexperienced in foreign trade, in the elements of exporting. Another has been definite assistance to large exporters in finding new and additional outlets in foreign countries for their products. A third has been the study of foreign markets for various commodities included in the "specialties" group. A fourth form of activity has been the handling of the results of an advertising questionnaire. In addition, special work of various kinds has been carried out.

Trade surveys were made of the market for outdoor-amusement devices in Latin America, metal beds in the Far East and Europe, furniture trimmings and cabinet hardware in Latin America, gas water heaters in all important countries, tent and awning hardware in the leading markets, piano parts in important foreign manufacturing centers, school slates in Latin America and the British Colonies, and a large number of miscellaneous articles. A questionnaire was also sent out regarding the character of American motion-picture films abroad.

A survey of foreign advertising media and methods has been made by means of a detailed questionnaire addressed to all American consuls. The American Association of Advertising Agencies has aided in this work, which is now practically completed. A large amount of foreign display advertising material was procured for the convention of the Associated Advertising Clubs of the World.

A world survey of the cutlery market was made. A campaign was instituted with respect to neglected markets. Many of the problems now belonging to the division of domestic commerce were handled by the specialties division, and a conference on the subject was held in Washington.

Under direction of this division an exhibit entitled "Export service, step by step" was prepared, showing by a series of 18 typical letters, together with charts, tables, and a map, how an American manufacturer, by submitting his export problems to the bureau, may obtain information and assistance.

In December there was a conference at which a plan of cooperation between the bureau and export commission houses was worked out. The bureau can now furnish lists of commission houses, showing what fields they cover and what lines they handle.

There has been active cooperation with trade associations, especially in the office appliance, pottery, bicycle, musical instrument, motion picture, jewelry, stove, and hardware industries. A ques-

tionnaire was sent out regarding foreign markets for American bicycles, and in the near future trade information bulletins on the various markets will be prepared.

The 4,337 commercial inquiries which the specialties division answered by letter during the year indicates an increasing interest in its work.

TEXTILE DIVISION.

The textile division has expanded its operations until it now has contacts with about 50 trade associations. During the first quarter of the fiscal year, E. T. Pickard, chief of the division, made a study of textile conditions in Europe, including such centers as Manchester, Liverpool, London, Havre, Paris, Lille, Strasbourg, Mulhouse, Winterthur, Zurich, Milan, Rome, Vienna, Warsaw, Lodz, Bremen, The Hague, Rotterdam, Brussels, and Ghent.

In the course of the year, officials of 20 trade associations visited the Washington office for special conferences. In cooperation with the chief coordinator of the Bureau of the Budget, the textile division has helped the War and Navy Departments to dispose of surplus textile stocks. An estimate of world wool production for 1922 was compiled. Two weekly bulletins are being issued, the Cotton Service Bulletin and the Cotton Piece-Goods Bulletin. Regular circulars are also being issued to the wool, knit-goods, and bristle trades.

Comparisons of the weekly average prices of cotton gray cloth in world markets were made throughout the year and cable quotations from Japan and India have been initiated. Various other important cable reports on textiles are received and published weekly, monthly, or quarterly.

The Washington headquarters of the division and the bureau's district offices answered 64,000 textile inquiries, as compared with 18,000 in the fiscal year 1922. Outgoing letters from the Washington office totaled 14,500.

Certain of the information gathered by Mr. Pickard on his European trip was summarized in brief surveys, by countries, and released to the daily press. The division's trade information bulletins included Textile Market in Cuba, Cotton Industry of Peru, Survey of Czecho-Slovak Cotton Industry, 1922, and Textile Industries of Belgium and the Netherlands.

TRANSPORTATION DIVISION.

The outstanding work of the transportation division during the year was in connection with packing for export and the elimination of theft and pilferage. John F. Keeley, the assistant chief, headed this investigation, visiting 300 plants, in more than 30 industrial

centers of the United States. The best methods of packing in use were checked by scientific bodies. The results of the investigation are being embodied in the form of a manual. Much advice on proper packing was given to exporters.

Five lines of action were developed for the prevention of theft and pilferage: (a) Better packing, in accordance with specifications to be published by the bureau; (b) the bonding of stevedores, receiving clerks, tally clerks, and others who handle valuable shipments; (c) the amendment of Federal legislation so that stealing from a railroad train, truck, warehouse, or other agency of transportation would be a Federal crime; (d) the establishment of a central bureau of information on pilferage cases; and (e) the endeavor to get foreign countries to carry out similar measures.

The division helped to get cars for the shipment, in this country, of wheat, potatoes, apples, citrus fruits, grapes, cattle, etc. Plans were made whereby a day's time was saved on express shipments from the Atlantic coast to middle western points. As regards the ocean bill of lading used in the lumber trade from the Gulf ports, the division was able to get a clause changed to suit southern lumber interests. In connection with the American Railway Association, the division was successful in having the embargo on automobiles for export raised at the port of New York.

The division's routine work of answering inquiries doubled during the year. Two trade information bulletins were printed. The monograph on Steamship Services from United States Ports was completed; Inland Water Transportation in the United States was in page proof at the end of the year; Internal Communications was sent to the printer; the revision of Government Aid to Merchant Shipping was turned over to the editorial division; the manual Packing for Foreign Markets was two-thirds completed; and substantial progress had been made on a handbook of railways of Latin America. Eugene S. Gregg is chief of the transportation division.

INVESTIGATION OF RAW MATERIALS AND AGRICULTURAL PRODUCTS.

In March, 1923, Congress passed a bill—

To enable the Department of Commerce to investigate and report upon the possibilities of developing the rubber-plantation industry in the Philippine Islands and Latin America; to investigate the conditions of production and marketing of other essential raw materials for American industries, including nitrates and sisal; and to investigate related problems in the development of the foreign trade of the United States in agricultural and manufactured products.

Under this act \$357,700 was made available for the Bureau of Foreign and Domestic Commerce, \$42,300 for the Bureau of Stand-

ards, and \$100,000 for the Department of Agriculture. Work was begun immediately after March 4.

The Bureau of Foreign and Domestic Commerce is making a thorough study of the sources of four raw materials—rubber, nitrogen, sisal, and tanning materials.

About \$140,000 will be spent in connection with rubber. The primary purpose is to study areas capable of producing rubber in competition with the plantations in the Far East, where the exportation of rubber is under monopoly control. Field parties are being sent to the Dutch and British plantations of the Far East, to the Philippines, to the Amazon region, and to Central America. The Amazon party is in charge of Commercial Attaché W. L. Schurz; the Department of Agriculture is sending a cooperating party into this region. David M. Figart has been sent to the Far East. For the work in Central America J. T. Treadwell has been engaged. The personnel for the Philippines has not yet been chosen. The results of the work of the field parties are transmitted to the crude-rubber section at Washington, which has been placed in charge of Harry N. Whitford, professor of tropical forestry at Yale University. The Bureau of Standards is conducting studies of the possibilities of reclaiming waste rubber and utilizing it for the manufacture of tires and other products.

The main purposes of the nitrogen survey are to determine, so far as possible, the extent to which our increasing requirements will be supplied by corresponding increases of fixed nitrogen in the coke and coal-gas industries, to study the Chilean nitrate industry from an engineering standpoint to ascertain what changes might be made in machinery or methods that would normally tend to lower the price, and to inquire into the status of the air-nitrogen industry in the United States and abroad. The aim is to lower the cost to American consumers and to determine the possibility of making this country independent of foreign sources. Harry A. Curtis, professor of industrial chemistry at Yale, has been engaged to direct the investigation. J. Foster Bain, chief of the Bureau of Mines, and H. S. Mulliken have been sent to Chile, to stay about three months. A representative of the Fixed Nitrogen Research Laboratory has been sent to Europe to examine present processes and costs of production of fixed nitrogen.

The sisal investigation consists primarily of a study of the present control of production and distribution, although some effort is being made to determine possible places of production other than Yucatan. Louis F. Crossette, who is conducting the work, has gathered certain facts not previously assembled. At the end of the fiscal year he was on his way to Yucatan for a brief field study that

will be shared in by a representative of the Department of Agriculture.

The object of the tanning-material study is to determine the domestic sources and stocks. For the last two or three months of the fiscal year, therefore, this bureau and the Tanners' Council have been assembling, by means of questionnaires, all the facts in connection with the domestic industry. This work has been placed in charge of Wilbur J. Page, chief of the bureau's hide and leather division. By the end of the fiscal year complete figures were obtained on production of domestic tanning extracts; detailed figures as to consumption of extracts and barks were secured from more than 90 per cent of the tanners of the country, and these figures were compiled and reduced to bark tons, so as to be comparable with the production figures. Through the cooperation of the Forest Service, new estimates were obtained as to the stands of chestnut timber. Through the aid of the Bureau of the Census and the lumber division figures and estimates were furnished for the production and consumption of chestnut timber. The advisory committee representing the Tanners' Council decided that it was unnecessary to pursue an investigation of tanning materials outside the United States. The sum of \$12,000 has been transferred to the Bureau of Standards for technical studies in connection with tanning-material compounds and processes.

The international agricultural-products study is founded upon the very apparent need for more accurate information as to the possibilities of selling farm commodities in export markets. Frank M. Surface, who had been in charge of the Survey of Current Business in the Bureau of the Census, was appointed to take charge of the investigation. A committee comprising representatives of agricultural organizations and exporters was appointed to direct the broad lines of this work and to formulate constructive conclusions from the results.

The first phase of the work is a statistical study designed to give a background of fact with regard to our trade in the more important agricultural products. A second phase deals with market practices. Questions of the supply of credit in relation to the demand for it, how exporters are financing their operations, questions of transportation, storage, warehousing, port charges, ocean freight and insurance rates, packing, distribution in foreign countries, etc., are being studied. A third aspect of the work is a study of general economic conditions in the industrial area of western Europe, which forms the chief market for our agricultural products. So far as possible, the staff of the department is being used in carrying on these studies. A considerable portion of the work is being done by divisions of the bureau, such as the division of foreign tariffs, the

transportation division, and the regional divisions. Alfred P. Dennis, who has been special trade commissioner in Europe for several years, has undertaken to interview foreign importers and merchants in the chief markets of Europe to determine the practices employed by them. For the study of general economic conditions, H. B. Smith, who has been trade commissioner at Warsaw for several years, has been assigned to the task of collecting and correlating the information in the various European offices of the bureau and of making additional studies along this line. E. G. Montgomery, chief of the foodstuffs division, has gone to Europe to assist in the investigation. Several experts have been added to the staff at Washington.

REGIONAL DIVISIONS.

GENERAL CHARACTERISTICS OF WORK.

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 special and 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; maintains close relations with the foreign Government; cooperates with the American Embassy or Legation; and constantly facilitates such contacts and connections as will result in increased sales of American goods.

EUROPEAN REPRESENTATIVES' CONFERENCE IN ROME.

The commercial attachés and trade commissioners in charge of European offices (except those in Riga, Bucharest, Athens, and Copenhagen) met in Rome for a conference the latter part of March. O. P. Hopkins, assistant director of the bureau, and Alan G. Goldsmith, chief of the western European division, were present. The economic situation, especially as it affected American trade, was thor-

oughly discussed and reported to Washington. All administrative problems involving the bureau's foreign staff were taken up, and such improvements as could be carried out at once were made on the spot. The Washington representatives brought home with them the recommendations of the group.

The Rome conference was timed to coincide with the meeting of the International Chamber of Commerce, and the American Department of Commerce officials were placed at the disposal of the American delegation in an advisory capacity. At a series of general conferences they outlined the commercial, financial, and economic situation to the American delegation and also assisted individual business men attending the meeting.

The bureau has decided to place subordinate offices in some of the commercial and industrial centers of important countries. During the fiscal year 1923-24 it has been planned to establish one at Barcelona, under the jurisdiction of the commercial attaché at Madrid, and one at Milan, under the attaché at Rome; and to give the commercial attaché in London facilities so that his commodity specialists can maintain contacts with the industrial centers in the United Kingdom.

To an increasing extent the bureau's foreign representatives, during the past year, have assisted not only American business men but also prominent American Government officials. An exceptionally large number of high officials, including Senators and Representatives, have gone abroad on trips of investigation and have been given valuable information and guidance.

EFFORTS AND ACHIEVEMENTS OF REPRESENTATIVES IN WESTERN EUROPE AND SOUTH AFRICA.

Commercial Attaché Charles H. Cunningham was in sole charge of the Madrid office except in January, February, and March, when he had the help of Assistant Trade Commissioner O. S. Payne. He was successful in finding suitable representatives in Spain for numerous American firms. He induced the Spanish Government to send a high official to the United States, instead of to some European country, for the purchase of about \$150,000 worth of machinery. He saved about \$40,000 for American tire exporters by arranging for the entry of shipments arriving without proper certificates of origin. He obtained permission for the reexportation of some American specialties without the payment of Spanish customs duties, thereby obviating the payment of \$14,000 for such duties and preventing the goods from becoming a dead loss, as would have happened had they remained in Spain. He brought about the postponement of the operation of a decree requiring tire manufacturers with branches in Spain

to furnish the Spanish Government with memorandums of all stocks on hand, with identifying serial numbers which could be checked against customs invoices, thus avoiding the payment of heavy fines for noncompliance.

The major reports from the Madrid office included articles on lumber, tariffs, automobiles, chemicals, commercial laws, transportation, foodstuffs, specialties, rubber, electrical equipment, and iron and steel. Of particular importance was a general survey of conditions in Portugal. Several studies were made of Spanish taxation laws, especially those affecting American concerns operating in Spain.

Visits of investigation were made to Portugal, northwestern Spain, and Barcelona. The attaché received considerable assistance from the American consuls in Spain. The American ambassadors have continually called on Mr. Cunningham for assistance in various matters, especially in connection with customs regulations and the negotiation of a new commercial treaty between Spain and the United States.

Commercial Attaché Walter S. Tower has continued in charge of the London office and has been supported, as previously, by Assistant Commercial Attaché Candler Cobb, Trade Commissioners Alexander V. Dye and Hugh D. Butler, and Assistant Trade Commissioners H. B. Allin-Smith and W. M. Park. In addition, Trade Commissioners Leland Rex Robinson and Alan Dawson did special investigation work for a short period. The internal organization of the office was the same as in the previous year. The members of the staff have made frequent visits to the provincial commercial centers of the United Kingdom, thus keeping informed on industrial and trade conditions. In various cases the office has helped to adjust commercial difficulties, while adjustments of outstanding claims were secured in cases involving consignments of portable motors, books, lumber, and machinery. Relief from excessive import duties and refund of duties already collected (amounting to several hundred pounds sterling) was arranged in the case of certain oil products. There were successful intercessions in behalf of the holders of the Chinese reorganization 5 per cent gold loan of 1913. The office also secured, in the interest of the American lumber trade, an official ruling that Oregon pine (Douglas fir) would be acceptable on admiralty contract tenders. In many cases the office was instrumental in obtaining representatives for American firms in Great Britain or vice versa. There were forwarded to the Washington office for publication and distribution about 350 special reports, the character of which may be illustrated by the few titles following: "Representative wages and wage bases in Great Britain," "Foreign-credit facilities in the United Kingdom," "The reorganization of railways

in Great Britain," "Economic position of the British farmer," "Lower trans-Atlantic freights for machinery," "Methods of handling American lumber imports," "The London market for American textiles," "Areas of steel-plant concentration in Great Britain: Their equipment and competitive advantages," "British livestock situation and market for imported fats," and "British market for women's leather wearing apparel." The reports and surveys from the London office covered all the chief commodities, prices, unemployment, legislation, and a limitless variety of topics.

Trade Commissioner Perry J. Stevenson remained in charge of the Johannesburg office. Closer contacts were formed with South African commercial interests, and American business interests relied on the office to an increasing extent. For purposes of trade promotion two trips were made to Cape Town, one to East London (and thence to Port Elizabeth), and another to Bloemfontein. Thirty investigations were made covering various important South African markets. The reports included "Cotton goods in South Africa," "Methods of handling lumber imports in Africa," "Shoe industry and trade in South Africa," "Manufacturers' agents in South Africa," "South African motor trade," "South African market for metal furniture," "Market for slates and slate pencils," "Oil in South Africa," "New customs regulations," "South African banking in 1922," "The asbestos industry in British South Africa," and "Drill-steel discovery in South African gold mines." A report was prepared revising the monograph on markets for agricultural implements and machinery in South Africa. Numerous American manufacturers have been aided in securing agents and distributors for their products. Other concrete results made possible by the office included sales of complete ginning plant, tractors, motor cars, motor trucks, automobile accessories, lantern projectors and slides, cotton goods, and other lines. Mr. Stevenson was especially active in the protection of American trade interests in connection with the South African customs regulations. The office enabled American exporters to conclude 49 agency agreements, the resultant sales (for which the office is directly responsible) amounting to \$750,000.

Commercial Attaché H. C. MacLean has remained in charge of the Rome office, with the aid of Assistant Commercial Attaché A. A. Osborne. The work has resulted in actual savings of considerable amounts to American business houses. Mr. MacLean has been successful in effecting settlement of claims against Italian firms, in one instance obtaining payment of an overdue account amounting to about \$13,000 for an American firm, and in another case obtaining an increase of several thousand dollars in the amount offered by an Italian company in settlement of its account with an American house. At another time a reduction of the excessive rate of duty

charged on a shipment of American specialties was obtained. Through the mediation of the attaché more speedy payment of an account against the Italian Ministry of Posts and Telegraphs was brought about. Notable assistance was given to prominent Americans, including Government officials. Mr. MacLean and Mr. Osborne have made several trips to northern Italy, the center of Italian industry and foreign trade. The subject matter of the 125 special reports from the Rome office included, among many other topics, careful studies of the iron and steel trade of Italy, the automobile, cotton, artificial silk, rubber, and leather industries, and the markets for vegetable oils, lumber, agricultural machinery, automobile accessories, and ready-made clothing. Special attention has been paid to public and private finance, in connection with which several exhaustive reports have been written. The situation of the railways and the merchant marine has been analyzed. With the cooperation of Italian attorneys of high standing, digests of the Italian laws applying to foreign concerns doing business in Italy have been prepared. A large amount of data regarding the citrus-fruit industry and its by-products has been transmitted.

Chester Lloyd Jones assumed charge of the Paris office as commercial attaché on September 25. He has been supported by Assistant Commercial Attaché J. F. Butler and Assistant Trade Commissioners F. G. Singer and D. S. Green. It has been largely through the work of the attaché's office that American firms have been enabled to obtain export licenses for goods bought by Americans in the occupied territory of Germany. The office, in conjunction with the embassy, worked out a plan of releasing these goods for shipment, and Mr. Butler was detailed to take entire charge of the work. Thus American firms have been saved from great financial loss. The office was instrumental in obtaining the admission of an American product to France under a customs classification requiring the payment of a lower rate of duty than that first imposed. Through the efforts of the office, French manufacturers became interested in a new American process for producing a special type of cement; one of the largest factories in France is now making the cement under an American patent. Through the attaché the failure of certain foreign agents to represent adequately an American firm was disclosed and suitable new agents for the company were found, thus replacing a total loss by a lucrative business.

Commercial Attaché S. H. Cross has been in charge of the office at Brussels, Belgium. The office was instrumental in obtaining a radical reduction of the projected duty on automobiles and also negotiated a notable reduction of the proposed tariff on American prunes. The office also secured revision of revaluations made on import shipments of American automobiles, considerably increasing the

sale of the vehicles; one company was thus saved a large amount of money. Another American company obtained control of an important explosive plant in South America as a result of information obtained by the Brussels office in cooperation with one of the bureau's offices in South America. Numerous agencies were successfully placed for American products, including hosiery, cleaning compounds, automobiles and accessories, soap, toilet articles, and other specialties. Apart from 2 semiannual reports on the cotton industry, the 65 special reports from Brussels covered, among other topics: Agricultural-implements production, food regulation, commercial law, Belgian shoe market, Belgian public finance, Government aid to merchant shipping, handling of lumber imports, railroad freight rates, markets for motor vehicles and bicycles, fire insurance, relation of taxation to national income, the Franco-Belgian economic accord, finance and equipment of the State railroads, the lead and zinc industries, foodstuffs consumption, the market for stearic and oleic acids, the status of silver currency, the cement industry, the button industry, and the Belgian iron and steel industry during 1922.

Commercial Attaché C. E. Herring has continued in charge of the Berlin office, being aided by Assistant Commercial Attaché Donald L. Breed, Trade Commissioner Arthur J. Grey, and Assistant Trade Commissioners W. T. Daugherty, O. S. Payne, E. M. Zwickel, M. L. Goldsmith, and F. W. Allport. American business has been kept constantly informed concerning the rapidly changing conditions, correct analyses and forecasts being furnished. Considerable effort was directed toward obtaining the release of American goods held in the Ruhr district. Many American investigators who have called at the office have been aided, especially valuable service being rendered to the representative of a large American electrical company. Of unusual value to the American business man have been the numerous reports from the Berlin office, including, for example, "The German iron and steel industry," "The German industrial situation in June," "Some factors affecting the cotton textile industry of Germany," "Foreign investment in Germany," and "Labor, wages, and unemployment in Germany." An investigation of the German chemical industry proved especially valuable. Mr. Herring, together with Mr. Jones, of the Paris office, visited the Ruhr, and the two attachés prepared a joint report, which has been the basis for much reference in the bureau in replying to inquiries. Germany has been an attractive buyer's market, and the furnishing of information to American purchasers has taken some time. Important services were rendered to the visiting delegates of the United States Chamber of Commerce and to the committee of international economic experts.

At Vienna Trade Commissioner William Ford Upson has been in charge, aided at various periods by Assistant Trade Commissioners

Allport, Zwickel, and Prentiss M. Terry. In a number of cases the trade commissioner's services resulted in definite monetary savings on new business for American firms operating in Austria. He effected the sale of \$50,000 worth of American tobacco after five previous attempts by others had failed. Despite many difficulties he brought about the exhibition of an American cinema film at a return of \$10,000 to the producer. He obtained a reduction of duty on a shipment of American corn sirup. He was instrumental in securing the unloading of several carloads of perishable meat products shipped by an American packer which were held up by a strike of transport employees and were in danger of spoiling; a Government guaranty of protection under similar conditions in the future was obtained. He was able to secure the removal of import restrictions on American typewriters. The Vienna office kept Americans informed concerning the various phases of the scheme.

The Prague office has been for various periods of the year under the direction of three representatives—Assistant Trade Commissioner Owen S. Payne and Trade Commissioners V. A. Geringer and H. Lawrence Groves. Much attention was paid to developing closer relations between American firms and their agents in Czechoslovakia. Disputes were settled, import licenses arranged, and customs duties reduced; permanent reductions are expected in the duties on automobiles, machinery, and certain kinds of leather. American importers were enabled to make connections with sources of supply without the expense incident to a personal investigation. Two trips were made, one to the Skoda works at Pilsen and to the glass factories and breweries in that vicinity, and another to Sub-Carpathian Ruthenia, where negotiations are in progress leading to the investment of \$6,000,000 of American capital in a lumber development.

Trade Commissioner Howard W. Adams was in charge of The Hague office until January, when direction was assumed by Paul S. Guinn. The office has been active in the settling of commercial disputes and was instrumental in the successful arbitration of a claim by an American firm involving \$82,000. Another disputed transaction involving a considerable shipment of furs and skins was satisfactorily terminated. Mr. Adams facilitated the importation of American pumps into the Netherlands. Comprehensive reviews of various Dutch industries have been made, and there have been complete surveys of the shipping and shipbuilding industries, as well as periodic reports on Dutch agricultural activities. Numerous representatives of American firms have called on The Hague office, which has created many financial and industrial contacts.

The Copenhagen office, covering Denmark, Norway, and Sweden, has been in charge of Assistant Trade Commissioner Harry Sorensen. Unusual activity has marked the work of the office, as American firms

have become increasingly interested in Scandinavian markets. About 150 profitable business connections were secured for American firms by Mr. Sorensen. Agencies for the sale of American products were obtained, among which representation for a large American metallurgical concern and for a well-known American food-products company deserve special mention. Several commercial disputes were settled through the services of Mr. Sorensen. The assistant trade commissioner has attended various trade gatherings and fairs. The situation in the important Scandinavian industries has been thoroughly covered by more than 500 reports sent in by Mr. Sorensen during the year.

WESTERN EUROPEAN DIVISION AT WASHINGTON.

Alan G. Goldsmith continued as chief of the Western European division at Washington. Through its advisory committee of bankers and industrialists the division has maintained intimate contact with problems in the European field confronting American manufacturers. Close attention was given to the interallied debt settlement and the reparation issue. The division made a special effort to work up information on fiscal conditions, especially the budgets and the foreign-trade situation in the countries of western Europe. The discussion of budgets of western European countries by Douglas Miller was issued as a trade information bulletin. The demands of American business executives necessitated very specialized work on the labor and unemployment situation in Europe. Such reports as "Labor, wages, and unemployment in Germany," "Representative wages and wage bases in Great Britain," and "Establishment of branch factories in Germany" were in great demand. In addition, special articles in Commerce Reports, such as "Unemployment in western Europe," by the chief of the division, were given wide publicity.

As the Western European division covers not only the countries of western Europe but also the great majority of their dependencies in Africa, information is compiled with a view to determining the market for American products in such dependencies. The trade information bulletin on Tanganyika was very well received and is the forerunner of similar studies.

Almost 300,000 inquiries on western European matters have been handled during the year by the bureau and its district and cooperative offices. Statistics have been prepared for publication in the Survey of Current Business.

Considerable work has been done in order to safeguard the commercial interests of the United States through contact with other departments of the service. Voluminous studies were prepared for the Secretary of Commerce in connection with various missions coming to this country in connection with the interallied debt.

The division has maintained very complete information on developments resulting from the Ruhr occupation and, in cooperation with the Department of State and with the division of foreign tariffs, has aided more than 100 American firms in executing contracts that were held up on account of the occupation, and also in reclaiming goods confiscated by the occupying forces.

Upon the conclusion of the conference of commercial attachés at Rome in March, the chief of the Western European division made a tour of inspection of the European offices. At the same time he discussed economic and commercial problems with leading statesmen, financiers, and business men. Upon his return he made important reports. Mr. Goldsmith has also given considerable attention to the liaison work with the War and Navy Departments.

WORK OF REPRESENTATIVES IN EASTERN EUROPE AND LEVANT.

Acting Commercial Attaché H. B. Smith was in charge of the Warsaw office during the greater part of the fiscal year, but returned to Washington about June 1 in preparation for an assignment in Europe in connection with the world agricultural-products investigation. Leighton W. Rogers will shortly be placed in charge at Warsaw. Elbert B. Baldwin replaced Fayette W. Allport as assistant trade commissioner there in August, 1922. The Warsaw office has found the function of protecting American interests against loss equally important with that of promoting trade. Numerous reports on general conditions have been submitted, together with such important special reports as those on the "Polish timber program," "Precautions to be observed in marketing in eastern European countries," "Eastern Galician question and Polish oil developments," and the "Polish textile industry and American relations to it." Mr. Baldwin prepared a report on the Austrian magnesite industry. The Warsaw office aided important American concerns in conducting business in Poland, and especially in transactions with the Polish Government. One of these cases related to a contract involving several million dollars' worth of goods, and another to negotiations for equipment valued at \$750,000.

The Riga office (whose territory embraces Latvia, Lithuania, Estonia, and Finland) was in charge, successively, of Trade Commissioners H. Lawrence Groves, Leighton W. Rogers, and Carl J. Mayer. The monthly cables and the weekly and monthly mail reports from Riga have been very useful in setting forth economic conditions and the prospects for American trade.

The bureau's office in Bucharest, Rumania, has remained in charge of Acting Commercial Attaché Louis E. Van Norman. The office has submitted economic and statistical information of much value, among

the special reports being "The sugar shortage in Rumania," "Revised Rumanian export and import taxes," "Rumanian-German war reparations negotiations," "Funding Rumania's foreign debt," "Rumania's industries," and various reports dealing with lumber, petroleum, and agricultural products. It has protected American interests, helped to collect claims, and advised as to trade and investment opportunities. Mr. Van Norman made a tour of investigation in the Banat and Transylvania, regions annexed to Rumania as a result of the war.

Trade Commissioner Julian E. Gillespie was in charge of the Constantinople office, but was absent for considerable periods at the Lausanne Conference and on a trip to Angora, at which time the work of the office was directed by Assistant Trade Commissioner H. B. Barton. Mr. Gillespie cooperated closely with the American member of the High Commission. He kept the bureau well informed as to conditions affecting American trade and other interests and has made special reports, such as the one on "Marketing of iron and steel products" and several on the market for flour. Mr. Gillespie's trip to Angora, a region unfamiliar to most Americans, resulted in the obtaining of much instructive information. The Constantinople office helped Americans to collect certain claims long overdue.

After the transfer of Commercial Attaché Paul L. Edwards from Athens to Habana in June, 1922, the bureau had for some time no representative at Athens. Meanwhile Mr. Edwards prepared an extended report on the system of exchange control then prevailing in Greece and reports on other economic, financial, and legal conditions affecting American business men in dealings with Greece. This was distributed as a special circular. In September, 1922, a permanent post of the bureau was established at Athens and Acting Commercial Attaché R. O. Hall took charge. Mr. Hall has built up an efficient organization and has been very active in the promotion and protection of American interests. Among the special reports may be mentioned "American sales in Greece," "Greek exchange restrictions codified," "Bicycles in Greece," "Bankruptcy and insolvency laws," "Survey of Greek lumber market," and "Leather in Greece." Mr. Hall has given special attention to the possibility of American investments in Greece. He has given aid in matters relating to export permits, taxation, exception from exchange restrictions, claims for requisitioned goods, and the like. He has succeeded in effecting postponements of awards upon various railway and other supplies in order to give American merchants an opportunity to put in their bids. Mr. Hall made an inspection tour in Macedonia, Thrace, the Peloponnesus, and the Cyclades Islands.

After the Genoa and Hague conferences it became possible to follow Russian relations adequately through the regular representa-

tives of the bureau in various posts, as well as through Soviet publications; consequently, the special field investigations regarding Russia were largely discontinued. Trade Commissioner Mayer remained in the Far East till February, spending part of his time at Vladivostok, part at Harbin, and making a brief visit to Chita. He obtained valuable information concerning the resources of Siberia and the existing commercial and economic conditions in that region. Among the most significant of his reports were those on "The Chinese Eastern Railway" and "An economic survey of the Russian Far East." Mr. Mayer helped an American concern to obtain an important construction contract in Manchuria, and also protected American rights as regards goods stored at Vladivostok.

Trade Commissioner Barton remained at Tiflis, Georgia, until December. On returning to Constantinople he made an extended general report on economic and commercial conditions in the Caucasian territory. He also furnished a number of special reports as to lumber, manganese, petroleum, and other industries and branches of commerce, translations of official decrees, extracts from local periodicals, and the like.

EASTERN EUROPEAN AND LEVANTINE DIVISION AT WASHINGTON.

As of July 1, 1922, the Near Eastern division was consolidated with the eastern European division under the title "Eastern European and Levantine division." E. Dana Durand continued as chief, and James A. Robertson became assistant chief of the reorganized division and head of its Levantine section. Mr. Robertson resigned in May, 1923.

It has been necessary for Americans to exercise unusual care with regard to credits, terms of contracts, consignment stocks, and investments in the countries covered by this division, which has answered many inquiries, both for general information and regarding particular business problems. Besides revising reports from Government representatives abroad, the division has compiled many articles and circulars on the basis of official statistical and other publications, foreign-trade periodicals, and similar material.

An extended article regarding government debt and note circulation in European countries was prepared by the chief of the division and published in Commerce Reports. The division published during the year about 15 special circulars and trade information bulletins. The Levantine section prepared a handbook of Tunis.

This division maintains an expert staff for the translation, compilation, and analysis of material on Russia from Soviet and other sources. It thus furnishes information that would otherwise be

practically inaccessible. The division aims to avoid controversy and to present fairly statements from both sides, indicating clearly the source.

In April a circular on "Trade with Russia" was issued. During the year, also, an extended abstract was made from a Soviet document relating to pre-war foreign investments in Russia; this will be published as a trade information bulletin. Work was begun on a handbook of Russia and continued on the handbook of Siberia.

Various addresses have been made and conferences held by officials of the division. An extended memorandum as to Rumanian finances was prepared for the Commission on Interallied Debts. The chief of the division has acted, during the latter part of the year, as chairman of a committee for the supervision of work on the new Commerce Yearbook.

FIELD REPRESENTATIVES IN THE FAR EAST.

The commercial attaché to China, Julean Arnold, served for six months on the China Tariff Revision Commission as chairman of the American delegation, which was instrumental in securing the adoption of a number of important amendments to the tariff rules. Following these conferences Mr. Arnold returned to the United States, where he made a five months' tour, visiting about 35 cities and making about 100 addresses.

On the passage of the China trade act Trade Commissioner Frank Rhea was appointed registrar, but he continued to act as the head of the bureau's China organization until the return of Mr. Arnold. Mr. Rhea rendered practical service to a number of American firms in the matter of claims against the Chinese Government for the supply of railway equipment and materials. The Shanghai office of the bureau handled a large number of inquiries from American firms and rendered special assistance to many Americans visiting China. It compiled 85 special trade reports, the more important of which included "Raw cotton imports into China," "Blast furnaces and steel mills," "Electrical equipment in China," "Kinds of lumber imported into China from America," "Siberian pine versus Oregon pine in the China market," "Kerosene oil prices cut," "Bicycles in China," "Motor-bus service in Shanghai," and "Electrical-equipment trade during 1922." Trade Commissioner Lansing W. Hoyt made a special investigation of the iron and steel trade in China. Since his return to China in May, 1923, Commercial Attaché Arnold has assisted the legation in representations to the Chinese Government regarding an agreement for the installation of a powerful wireless station in Shanghai and substations in other sections of the country.

In addition to the officials already mentioned, the bureau's China organization has included Assistant Trade Commissioner A. Bland Calder at Peking and Assistant Trade Commissioners A. V. Smith, Osborne S. Watson, John H. Nelson, and George C. Howard at Shanghai.

The Tokyo office, in charge of Commercial Attaché James F. Abbott, was active in the protection of American trade-marks against infringement. On his own initiative the attaché protested 10 trade-marks registered by persons other than the American owners. The office also brought about the collection of claims by American houses against firms in Japan. It mediated with the Japanese tax office and obtained a reduction from \$45,000 to \$4,000 in the claim for taxes against an American firm. A large cash-register company was assisted in securing a modification of a customs ruling, reducing the tariff rate on roll paper. A large chemical company was aided in a complex situation involving a fraudulent contract. A motion-picture company was assisted in preventing the showing of a stolen film. Many letters were written in response to inquiries. Some of the more important reports prepared by the Tokyo office were "Bicycles in Japan," "Japanese automotive imports," "Agricultural implements," "Market for ready-made clothing," "Japanese trade in iron and steel," "Japanese imports of cotton yarn," and "Foreign paper sales in Japan." The commercial attaché was helpful to a number of American business missions to Japan. He has had the aid during the year of Trade Commissioner Halleck A. Butts and Assistant Trade Commissioner Paul P. Steintorf.

J. W. Sanger, the trade commissioner at Melbourne, Australia, transmitted information on commercial, financial, and economic conditions, political developments, and proposed tariff changes in Australia and New Zealand. He conferred with representatives of important American interests, answered inquiries on a large number of subjects, gave advice and letters of introduction to Australian business men about to visit the United States, and furnished information asked for by Australian Government officials. The Melbourne office mediated in claims made by Australian importers of American goods alleged to be unsatisfactory. An outstanding feature of the trade commissioner's activity was a week's trip in September, covering 1,000 miles by rail and 300 miles by motor car, into the interior of Victoria for the purpose of studying conditions there. Another week was spent in Sydney, the commercial center of Australia, establishing contacts with banks and large importers. The office has carried on a publicity campaign by sending to the Australian press carefully edited material on economic conditions in the United States and Australia. Arrangements were made by which the receipt of New Zealand statistics has been expedited. The following titles may be

mentioned as examples of the special reports submitted by the Melbourne office: "Automotive market conditions in Australia," "Pearl-shell and pearling industry in west Australia," "Australian oil situation," "Market for malted milk in Australia," "Australian market for gas water heaters," "Water-power development projects," "Credit conditions in Australia."

With a view to enlarging the bureau's activities in the Philippine Islands and developing trade relations with the Dutch East Indies, British Malaya, the Straits Settlements, Siam, and French Indo-China, Trade Commissioner John A. Fowler established an office at Manila toward the end of 1922, with Edwin B. George as assistant trade commissioner. Before going to Manila Mr. Fowler made a complete tour of the outlying districts under the jurisdiction of his office, subsequently submitting a special report on the conditions prevailing. Through cooperation with American consuls, the trade commissioner arranged for a monthly cable service covering all his territory. The Manila office was early called upon to furnish data for the information of the Governor General concerning the advisability of establishing a board of trade in the Philippine capital; the trade commissioner became a member of the temporary organization later formed. Close cooperation with the Governor General's office has been maintained. Mr. Fowler made addresses before commercial organizations on "Conditions of business in the tropical Orient" and on the subject of Manila as an entrepôt for American trade in the Orient. He stressed the importance to Manila business men of the port's development.

Trade Commissioner C. C. Batchelder returned to India in October, 1922, landing at Bombay, where he spent a short time studying conditions and establishing contacts. Later, at Calcutta, whither he was called by the arrival of Assistant Secretary of Commerce Huston, Mr. Batchelder's interviews with officials gave him a special insight into Indian conditions. Early in November he opened the bureau's Calcutta office, being joined in December by Assistant Trade Commissioner Charles B. Spofford. In January Mr. Batchelder was called to Madras, where he was successful in aiding an American firm in a dispute over railway supplies. The Mysore silk industry was also studied with a view to a market for tractors. A special investigation of the jute situation was made, eliciting the commendation of American jute firms. Much time was spent in obtaining data on credits and compiling lists for the bureau's World Trade Directory. Among the 75 longer special reports submitted, there may be mentioned "Political conditions in India," "Trade conditions in Bombay, Calcutta, and Madras," "Selling goods in British India," "Motor transport in Burma," "Building construction in

India," "Market for lumber," "The Sukkur barrage," "Paper trade in India," and "Seasonal sales chart for the automobile market." Trade Commissioner Batchelder returned in March to the United States, where he wrote reports, held conferences with bureau division chiefs, and interviewed business firms in New York and Boston. Meanwhile the Calcutta office has been conducted by Mr. Spofford, who has carried out independent researches and secured increased business for American firms.

FAR EASTERN DIVISION AT WASHINGTON.

During the year the Far Eastern monthly cable service was extended to include reports from Siam, Indo-China, British Malaya, the Dutch East Indies, and the Philippines, in addition to China, Japan, India, Australia, and New Zealand, already covered. The reports have been improved so as to cover pertinent developments in such commodity fields as textiles, automobiles, foodstuffs, paper, iron and steel, etc., and more information on stocks, production, import and export trends, and price variation is now being received. Some large banks and business organizations have actually discontinued similar cables from their field representatives and have come to depend entirely on the bureau's service.

Besides maintaining a regular section in Commerce Reports, the Far Eastern division, of which Frank R. Eldridge is chief, has prepared for the press a number of timely articles that have received wide publicity. One of these, on "Investments and sales in the Orient," pointed out the very close relationship between the investment of American capital and the extension of American trade. Several press statements were issued on "Economic conditions in the Orient." An article on "Oriental demand for silver" received very wide publicity. This was followed by an article for a banker's magazine on "How silver price movement affects China's trade." "China's trade in 1922" was accurately forecast soon after the reports for the third quarter were received. The division's research facilities were entirely relied upon in the preparation of an Economic Survey of China, to be published under the auspices of the American Bankers' Association.

During the year the division answered 2,872 direct inquiries on business conditions in the Far East, an increase of 20 per cent.

The committee of prominent business men with interests in the Far East, formed to advise the department on important matters of Far Eastern policy, has held numerous meetings and submitted many recommendations.

ACTIVITIES OF FIELD REPRESENTATIVES IN LATIN AMERICA.

The Buenos Aires office was in charge of Commercial Attaché Edward F. Feely, except from March 4 to May 8, when he was attending the Pan American Conference at Santiago. He was assisted at Buenos Aires by Trade Commissioner George S. Brady and Assistant Trade Commissioner Clarence C. Brooks. This office has become the most important center for commercial information in Argentina. During the year about 1,000 American traveling men, bankers, and other business representatives called there for data and to discuss their problems. The attaché arbitrated many disputes, resulting in satisfactory settlements, and assisted in the adjustment of several claims, one of which involved the sum of \$60,000. Through the efforts of the office many connections between American firms and local agents were made. These included the establishment of an American taxicab company in Buenos Aires, resulting in the sale of cars and taximeters worth \$45,000; the starting of a business in road-building machinery; the importation of fruit from the west coast of the United States; and a connection in the wire trade which resulted in an immediate order for \$15,000 worth of material. Traveling representatives of American firms were assisted in many ways, even to the actual consummation of business. A Government order involving a large amount of money was secured through the intervention of the attaché. Aid was given in negotiations for national and municipal loans.

Through the efforts of the attaché permission was obtained for the sale of an American brand of tooth paste that had been questioned by health authorities. A lower duty on cement was brought about. The proposed petroleum legislation was carefully watched and discreet pressure was exerted to prevent anything prejudicial to American companies; this also applies to the new Argentine tariff, which, as first proposed, would have raised the duty on certain American products, particularly automobiles. Argentine consuls were appointed to Los Angeles and Seattle after Mr. Feely had brought to the attention of the Government the need for officers at those points to facilitate the movement of products by the new Shipping Board steamship service. Authorization also was obtained for Argentine consuls at interior points in the United States to visé through bills of lading on shipments to Argentina.

The work of the Rio de Janeiro office was directed by Commercial Attaché W. L. Schurz, who had the assistance, for longer or shorter periods, of Trade Commissioner R. M. Connell and Assistant Trade Commissioners B. N. Noll, M. A. Cremer, and W. E. Embry. Much time was given to the Brazilian Centennial Exposition which opened in November and to the numerous congresses held at Rio. Mr.

Schurz lent his assistance to assure the success of the United States industrial exhibition by arranging for the showing of various American products. He aided Brazilian Government officials in regard to standardization of products and in the organization of a forestry service. The development of the new Brazilian tariff bill was closely followed. The question of a customs duty on flour sacks was satisfactorily arranged; assistance was given an American company in the matter of duty on razors; authorization for the analysis of an American brand of baking powder (whose importation had been forbidden) was obtained; and much time was devoted to the matter of tariff preferentials on certain American goods. Difficulties in regard to the consignment of steel shipments "to order" were satisfactorily arranged. The attaché aided a large American automobile concern and an American steel company in the matter of the reorganization of their trade with Brazil and their methods of selling. Information and aid were given to an American syndicate investigating the possibilities of developing northern Brazil through large investments.

There were about 1,000 callers at the attaché's office seeking information and advice. The office aided in negotiations for State loans; in arranging for payment for a steel order involving nearly \$500,000; was instrumental in establishing the importation of American fruit to Brazil; assisted in obtaining a large order for machine guns and rifles for an American company; and facilitated a large electrification contract. Through the assistance of the office American companies made local connections for the importation of many varied lines. Contacts resulting in orders for American automobiles, hardware and tools, school supplies, wire machinery, storage batteries, and phonographs worth many thousands of dollars were formed. The commercial attaché successfully arbitrated many claims involving insurance, attended to customs claims, arranged the payment on a large order for locomotives, and protested against certain customs regulations that operated to the disadvantage of American companies.

On September 15 a suboffice to the Rio de Janeiro office was opened in Sao Paulo under the management of Trade Commissioner R. M. Connell, who has closely followed the coffee situation, sending in special reports on the subject and cooperating with the American coffee mission. Numerous reports on other subjects of interest to American business were sent in, notably one on the woolen industry of Sao Paulo. Mr. Connell cooperated with the representative of an American construction company in obtaining the final payment of \$37,000 on certain work done in Sao Paulo, was active in obtaining the settlement of a large insurance claim, and assisted the representative of a large American automobile company in planning a

sales organization for Brazil. He was consulted on many subjects, including sales plans, agency arrangements, loans, electrification supplies, investments in Sao Paulo, and railway conditions. Mr. Connell visited, among other places, Santos, Rio Preto, and Porto Alegre to study industrial conditions.

The office at Santiago, Chile, was in charge of Commercial Attaché Charles A. McQueen until January 23, when he left for the United States, since which time Assistant Trade Commissioner W. E. Embry has been in charge. The activities of the office in settling claims and arbitrating disputes between Chileans and Americans have resulted in saving about \$25,000 for the American firms without disturbing the amicable relations between the parties. Many American commercial travelers have utilized the services of the office, and representatives of companies in the United States have been put in touch with Chilean firms; it is estimated that the business resulting from the contacts amounts to more than \$100,000. American companies have been aided in negotiations with the Chilean Government in connection with construction and other large projects. Much time has been spent in preparing reports desired by the bureau and in answering requests for information from firms and individuals in the United States. A monthly bulletin on economic developments was issued. A great deal of time was devoted to matters connected with the Fifth Pan American Conference, held in Santiago in March. Most of the 400 letters sent to the bureau dealt with commercial subjects, such as legal requirements for contractors, the market for various commodities, mail service between Chile and the United States, the lumber industry in Chile, and the revision of the Chilean tariff.

The Lima office has continued in charge of Acting Commercial Attaché W. E. Dunn. The office has been active in following up petitions on behalf of American firms for the refund of consular invoice fees on orders placed prior to the decree increasing such fees, and also in connection with the Peruvian tariff, continual efforts having been made to protect American interests. The office secured the temporary suspension of the levying of a 25 per cent fine for the omission of consular invoices on parcel-post shipments. Through the efforts of the office an American livestock commission made a visit to Peru which has resulted in an active interest in the United States as a source of purebred stock. The removal of a labor boycott against an American ship was obtained. The office has inaugurated a statistical service showing imports through Callao, thus making detailed information available to American firms. During the year the office handled 24 claims, for a total of about \$41,000; of this number 7 were definitely settled and 17 are still pending. Four trips were made to important sections of Peru to

collect material for a Commercial and Industrial Handbook, on which progress is being made.

Assistant Trade Commissioners John P. Bushnell and H. Bentley MacKenzie have been, successively, in charge of the Mexico City office. The political relations between the two Governments have handicapped the work of this office, which, nevertheless, has accomplished a great deal. A new series of weekly "oil letters" to the bureau was inaugurated and 33 have been sent in. The assistance of the office resulted in the establishment of an American taxicab company in Mexico City and the purchase of 50 cabs in the United States. The office helped in the obtaining of a large contract for the supply of school equipment to the Mexican Government. Several disputes over goods were settled. A number of American lines were placed with local agents and representatives. Contacts made possible by the office have resulted in actual sales in a number of cases. Credit information supplied by this office has been invaluable to American exporters, because of the disarranged banking facilities in Mexico and the liquidation of a number of large banks.

The Habana office has been in charge, successively, of Acting Commercial Attaché Chester Lloyd Jones, Assistant Trade Commissioner C. A. Livengood, and Acting Commercial Attaché Paul L. Edwards, with the aid of Assistant Trade Commissioner Howard H. Tewksbury. Much time was given to matters relating to the disposal of goods remaining in the bonded warehouses, and, through the activities of the office, satisfactory arrangements were made for disposing of a certain amount of these goods. Moreover, American exporters were saved hundreds of thousands of dollars through representations made by the office resulting in a decree providing that rejected merchandise in bonded warehouses could be re-shipped without the payment of duties. The office thoroughly acquainted itself with the activities of the Bank Liquidation Commission, so that it was able to act to protect American interests. Representations were made to the Cuban Government concerning pending legislation against which many American houses were protesting. Seventeen memorandums were presented to the Cuban Tariff Commission. Reports were compiled for, and other assistance rendered to, the other offices of the United States Government in Habana, particularly to General Crowder in connection with the 1 per cent sales tax. Matters pertaining to the Cuban sugar industry were investigated. Through the efforts of the office many disputes were satisfactorily settled, and information was given which resulted in profitable connections.

LATIN AMERICAN DIVISION AT WASHINGTON.

The chief of the Latin American division, Ralph H. Ackerman, made a trip of inspection of the bureau's offices at Lima, Santiago, Buenos Aires, Sao Paulo, and Rio de Janeiro, making suggestions as to improvements in efficiency. The division followed closely the exchange situation in Latin America. Public finances were given careful attention. There were analyses of the reawakened activity in most lines of production, of political conditions as affecting the economic situation, and of foreign trade movement.

Trade Commissioner P. L. Bell made a survey of the west coast of Mexico and on his return to the United States was assigned to duty in Porto Rico and the Dominican Republic; after a careful survey of these countries he will be sent to Central America. Trade Commissioner Carlton Jackson was sent to Caracas and other points in Venezuela to make a general survey of conditions; after completing this work he will open an office at Bogota, Colombia. Trade Commissioner Frank E. Coombs was detailed to Haiti to cooperate with the American administration there and to gather material for a revision of the bureau's handbook on the West Indies; later he was ordered to Cuba in connection with the investigation of sugar production.

An active part was taken in the work to assure success of the United States participation in the Brazilian Centennial Exposition. The division cooperated in an investigation to ascertain the amounts and character of investments in Latin America. A full analysis was made of the effects of the Ecuadorean Finance Commission. Three colonization projects were investigated to prevent losses by American investors. Information was given to contracting firms studying public works and industrial projects. Special investigations were made of land companies in Mexico. An analysis of American marketing methods and terms and of United States import and export statistics was made at the request of the Inter-American High Commission for the Mexican Government. Of far-reaching importance have been a series of budget studies carried on by the division during the year. Much material was prepared for the use of the American delegation to the Pan American Conference at Santiago, on which the chief of the division served as technical expert. The division cooperated in the investigation of world production of sugar. Material was prepared for the use of the Secretary of State on his visit to Brazil. A monthly economic cable service from consular officers in South America where the bureau has no representatives was inaugurated during the year.

A trade information bulletin was published on the Argentine Petroleum Industry and Trade. A report on the nitrate industry of

Chile was prepared and circulated through trade journals. A revision of the handbook entitled "South America as an Export Field" is under way.

TECHNICAL DIVISIONS.

DIVISION OF FOREIGN TARIFFS.

The division of foreign tariffs, of which Henry Chalmers is chief, 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. It studies trade-mark activities abroad and warns of infringements upon, or attempted unauthorized registration of, American trade-marks. 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.

While enlarged facilities and staff have permitted more intensive development of certain types of services, in general scope and range the specific services rendered to American business during the past year by the division of foreign tariffs have been essentially similar to those performed in the fiscal year 1922. There has, however, been a marked increase in the volume of the regular work. The quantity of outgoing mail shows an increase of about 30 per cent as compared with the previous year and of more than 70 per cent as compared with two years ago. The number of requests for information or advice replied to by the division during the past year totaled 6,759, not including about 1,500 telephone inquiries, 600 visitors, or the increasing number of special bulletins, notices, and circulars. Most of the inquiries that were answered by letter necessitated a good deal of research, and the greater number of replies were accompanied by specially prepared statements or memoranda.

DIVISION OF COMMERCIAL LAWS.

There has been a constantly growing demand upon the services of the division of commercial laws, of which A. J. Wolfe is chief. In addition to manufacturers, exporters, and their legal advisers,

other important auxiliaries of foreign trade, such as banks interested in the financing of foreign shipments, insurance companies, and freight forwarders concerned with the problems of liability for damage or loss in the carriage of goods at sea, and trade organizations promoting improved methods in international commerce, have availed themselves of the facilities of the division.

During the year just past the division was able to devote greater attention to the preparation of bulletins dealing with the legal aspects of foreign trade, and to constructive work on important aspects of international commerce. Trade information bulletins published have included the following: Trading Under the Laws of Hungary, Doing Business Under Japanese Company Laws, Insurance Regulations in Mexico, New Insurance Laws of Costa Rica, Powers of Attorney in Argentina, Agency Agreements in Foreign Trade, Legal Aspects of Trade in Portugal, Protesting Drafts in Latin America (four bulletins), Legal Aspects of Construction Enterprises in Latin America, Protesting Drafts in Australia and New Zealand, Legal Aspects of Construction Enterprises in Asiatic Countries, and Contractors' Requirements in France.

Through the efforts of the division, the attention of American manufacturers has been directed to the necessity of closely examining agency agreements for the merchandising of American products abroad. A series of articles on this subject appeared in Commerce Reports and the same topic was discussed in numerous conferences. Many American manufacturers and exporters submitted contracts to the division for review and suggestion.

The vital necessity of truth in advertising has been pointed out in a series of addresses and articles. In the office of the division a conference was held with the representatives of the Export Publishers' Association, and as a result stringent measures were taken by the publishers to eliminate unscrupulous advertisers and inaccurate statements.

The arbitration of commercial disputes in foreign-trade transactions made great headway. A conference on this subject was held in the Department of Commerce. An inquiry into the laws on, and facilities for, arbitration in foreign countries has been initiated by the division, and the findings are being prepared for publication. The division worked out, for the Tanners' Council, a basis for the arbitration of disputes arising from the sale of leather to foreign countries. In various specific cases of importance the division of commercial laws has successfully facilitated arbitration.

The protesting of drafts drawn upon buyers of American goods in foreign countries and unpaid at maturity is a problem presenting many difficulties. An investigation by the division of commercial

laws has resulted in the publication of a series of bulletins which review the subject for every commercial country and offer the credit man the first complete and accurate presentation. A tremendous demand for these bulletins has developed.

The standardization of bills of exchange is a movement that is being followed by the division. A form of trade acceptance was worked out.

The division has kept American trade bodies and individual inquirers currently advised of developments in connection with the proposed adoption of "The Hague rules" determining the liability of cargo carriers in the carriage of goods by sea.

There has been cooperation between the division of commercial laws and such bodies as the Chamber of Commerce of the United States, the International Chamber of Commerce, the National Foreign Trade Council, the Export Publishers' Association, the American Manufacturers' Export Association, the National Association of Credit Men, the Chamber of Commerce of the State of New York, the National Association of Manufacturers, and the American Bar Association. A volunteer committee of American lawyers has been exceedingly helpful not only with advice on foreign laws but also with suggestions as to correct procedure and opportunities of service.

Practically every commodity division in the bureau has enlisted the services of the division of commercial laws. Similarly, the branch offices of the bureau currently refer to the division inquiries on legal problems, collections, etc., and cooperate with it in foreign-trade adjustments. The division has handled 186 trade adjustments of American firms against foreign concerns and 258 complaints of foreign against American firms.

The chief of the division has made numerous addresses before meetings and conferences. The work of the division has been commended, in many instances, in trade papers and in the daily press.

The division has accumulated a collection of codes of all Latin American Republics and a number of European and Asiatic countries. It also has in its files numerous reports from practically all foreign countries on bankruptcy laws, consignment laws, bills of exchange, powers of attorney, and judicial procedure.

The number of outgoing letters on subjects handled by the division of commercial laws increased from 2,957 in the fiscal year 1922 to 10,030 in 1923 (including inquiries answered through district offices).

Approximately 100 separate law firms and more than 500 individual American concerns have made use of the division's facilities in direct correspondence. A number of foreign lawyers have offered voluntarily to cooperate with the division. The work of the division owes

much of its success to the cooperation of consular offices through the courtesy of the State Department, as well as the constant readiness on the part of the bureau's field men abroad to aid in the development of this service.

FINANCE AND INVESTMENT DIVISION.

The bureau's finance and investment division was organized July 1, 1922, with Grosvenor M. Jones as chief. It was determined that this new division should attend to all financial and economic questions that are international in scope and not limited to a specific country, and to matters connected with the flotation of foreign securities in the United States, with the investment of American capital abroad, and with the general aspects of foreign-trade financing. The division acts as the principal liaison of the bureau with banks and other financial institutions.

Much of the division's work has consisted of research in connection with requests from bankers and others for information regarding the public debt, foreign and internal loans, currency, exchange, etc., of foreign countries. Many of these requests have involved extended compilations and analyses of data.

The general economic and financial studies carried out during the year have included the following: Compilation of data on the unfunded credit balances due American bankers and industrial and trading concerns as of July 1, 1921, and July 1, 1922; a study of the balance of the international payments of the United States for the calendar year 1922; manner of funding the debt of Great Britain to the United States; changes in the monetary use of silver throughout the world since 1914; compilation of data on the foreign investments of the United States; public finances of Chile; history and status of the public debt and currency system of the Latin American countries; British investment trusts; foreign-credit facilities of the United Kingdom; foreign policies of British banks; financial review of the United States in 1922.

Numerous circulars were sent to a special mailing list, many of them being confidential and all of them dealing with matters of importance to bankers and other financial agencies. Trade information bulletins comprised British Investment Trusts, Foreign Credit Facilities in the United Kingdom, Financial Review of Great Britain, and British Banking: Foreign Policies of the "Big Five" Banks.

Many of the requests addressed to the division have called for special studies of a detailed character. A number of such studies have been prepared for Members of Congress and for other branches of the Government.

During the year the division wrote 2,236 letters, received 233 visitors, and supplied information over the telephone in 1,248 cases.

DIVISION OF RESEARCH.

The research division continued from the previous year its work of (1) handling general economic and statistical research problems not of a strictly regional or commodity nature; (2) preparation of the annual issue of the Statistical Abstract of the United States; and (3) services of a varied expert and technical character to other divisions of the bureau.

The division began the preparation of the initial issue of a new annual publication, Statistical Abstract of Foreign Countries. For the first several weeks of the year the division handled the trade inquiries from the chemical industry, but since the organization of the chemical division the research division has been relieved of all strictly commodity trade-inquiry work.

Reviews of the trade of the United States with the world and an analysis of world trade in 1922 have been published as trade information bulletins. An article on commercial research as related to the work of trade associations and one on the development and character of trade associations abroad were prepared for the department's handbook on Trade Association Activities. A series of comprehensive reports on the principal tanning materials have been prepared in conjunction with the hide and leather division. Translations of the import and export schedules of Austria, Hungary, Czechoslovakia, Switzerland, Germany, and Argentina have been made and prepared for publication.

The division prepares the foreign-country material included in the Survey of Current Business and regularly furnishes the statistical data relative to the United States published in the Monthly Statistical Bulletin of the League of Nations. It has also furnished the United States statistics appearing in the Statesmen's Yearbook and other similar publications.

The division has prepared the 1922 issue of the Statistical Abstract of the United States. A considerable amount of obsolete and detailed material was eliminated and some new material added.

In the research division has been centralized the preparation and execution of details of the Commerce Yearbook, a descriptive and statistical summary of industrial, commercial, and general economic conditions and developments in the United States and the world as a whole.

A service has been maintained for the development of the graphical presentation of the statistical material of the bureau. Many charts, maps, and display posters have been prepared. "Executive

desk-book services" have been developed for several divisions; these are series of loose-leaf charts and tables of current economic data.

The division prepared reference lists to published material of the bureau and made brief reports of a miscellaneous nature called for by other divisions. Another function has been translation from foreign languages and explanation and interpretation of the characteristics of foreign statistics.

DIVISION OF STATISTICS.

The most important event of the year in the statistical work was the transfer on January 1, 1923, of the Bureau of Customs Statistics at New York from the Treasury to the Commerce Department. This places in the Department of Commerce the full control of the functions of collecting, compiling, and publishing foreign-trade statistics. As a result of this step, figures are being published much more expeditiously, and it will be possible to bring this service up to a higher standard of real utility to the business community.

The statistical division compiles and prepares for publication statements of imports, exports, vessels entered and cleared, and other statistics of United States trade with foreign countries and noncontiguous territories. The division also issues regulations and instructions to collectors of customs regarding the statistical reports. All correspondence and inquiries pertaining to United States foreign-trade statistics are handled in this division.

The final revised edition of the new statistical classification of imports, to conform to the new tariff law, was issued on November 15. Quantities as well as values are required for all items. The number of separate classes in the monthly reports was increased from 710 to 1,000. The increase in the classes shown in the quarterly reports is much greater. A revision of the export classification, effective January 1, 1923, was made by discontinuing a number of small classes and by adding several classes in the machinery, electrical, and other groups.

About 200 special monthly typewritten and mimeographed statistical statements, of more than 1,200 columns, showing complete details of imports and exports by countries, are now issued, as compared with 92 tables, with 440 columns, in the previous year. These statements are mailed to more than 12,000 addresses, comprising trade journals, commercial organizations, and private firms.

The division supplies figures to various other Government departments that need them in their work. The statistical division answered during the year 9,677 inquiries pertaining to foreign-trade statistics, nearly half of which consisted of letters. In addition, 13,853 statistical inquiries were handled by the branch offices of the

bureau. This is approximately double the number of inquiries handled in the preceding year.

Weekly statements showing exports of grain and flour from the principal ports of the United States have been issued since January 1, 1923.

Plans have been completed, subject to the approval of the Post Office Department, to compile statistics of exports by parcel post, beginning January 1, 1924.

In compliance with the demand from the Central and Midwestern States for statistics showing the exports from that region, a compilation of exports by States of origin will be started next year.

John Hohn has continued as chief of the statistical division.

COMMERCIAL INTELLIGENCE DIVISION.

The work of the commercial intelligence division consists in gathering, from all foreign trade centers, authentic information relative to potential buyers of American products, and in locating in the foreign markets exporters of such raw materials as are essential to American manufacturers. The sources of this information are the Consular Service and the foreign representatives of the bureau.

The most notable constructive work of the division during the year has been the development of the Directory of Foreign Buyers, which now contains about 100,000 detailed reports, covering all the data that the American exporter requires for a sales contact. During the past year 250,000 separate trade lists were furnished to American business houses or organizations in response to direct requests.

To serve more satisfactorily the needs of particular industries, the field force abroad was called upon to submit specific data on individual firms; for example, special stress was laid on automotive and lumber industries; lists of foreign importers of automotive products were improved to include makes of cars handled and data as to selling organization, exhibition, storage, and repair facilities; lumber exporters were supplied with data indicating the specific kinds of lumber handled by foreign firms and whether such firms could be classed as importers, commission merchants, consumers, or agents. Similar improvements were undertaken in lists sent to exporters of coal, leather, and rubber goods.

A new service was inaugurated whereby American exporters seeking exclusive agency connections abroad can be furnished carefully selected names of agents qualified to serve them.

The demands for detailed sales information regarding foreign importers increased tremendously, 30,000 requests being received during the past year; the reports furnished in response to these

requests contained valuable data concerning the business, organization, financial and trade references, relative size, and general reputation of the firm, as well as other facts.

Confidential reports on foreign concerns resorting to unfair practices were supplied to trade organizations, banks, and business houses which it seemed expedient to notify.

The National Association of Credit Men in one of its recent publications stated that the activities of this division are unique in Government work, and recommended it without qualification to the attention and use of those members of the association engaged in exporting.

ADMINISTRATIVE DIVISIONS.

EDITORIAL DIVISION.

Commerce Reports, the weekly commercial magazine of the department, has made noteworthy progress during the fiscal year 1923. New features have been introduced. Among these are the two pages of comment and counsel that have appeared at the beginning of each issue since the 1st of January, 1923. A related feature, introduced in the spring of 1923, is that of the brief "messages to the trade" which now appear at the head of sections devoted to commodity or technical divisions. To enable the reader to grasp at once the salient points in the more important informational articles, a system of black-type summaries has been adopted. A department entitled "Queries of general interest," appearing occasionally, enables the bureau to answer briefly such questions as appear likely to interest a relatively large number of readers. At various times a section of "Book reviews" has been published.

At the beginning of June a new method of presenting the "Foreign trade opportunities" in Commerce Reports was adopted. They are now grouped according to the various commodities and are listed very briefly, in tabular form, and in strictly alphabetical order. The number of such trade opportunities published in the fiscal year 1923 was 4,290, as compared with 2,960 in 1922 and 1,926 in 1921.

A new "Finance" department and a department of "Construction news" have been introduced in Commerce Reports, and the regular features of the magazine have been appreciably strengthened.

Between June 30, 1921, and June 30, 1923, the number of paid subscriptions to Commerce Reports nearly doubled, increasing from 4,761 to 9,071.

The number of reports received from the Consular Service (including trade opportunities) rose from 29,535 in the fiscal year 1922 to 37,058 in 1923, and there was a proportionate increase in the reports from foreign representatives of the Department of Commerce.

Probably the most important of the monographs handled by the editorial division was the department's publication on Trade Association Activities, prepared by L. E. Warford and Richard A. May, under the supervision of the director of this bureau. This book of 368 pages describes the constructive work of the associations, in all its branches and aspects. There are discussions of legislative activities, statistical compilation work, simplification and standardization, cost accounting, credit and collection activities, trade disputes and ethics, employee relations, insurance, public relations, traffic and transportation, commercial research, industrial research, and Government relations. The investigation that led to the publication of Trade Association Activities was undertaken jointly by the Bureau of the Census, the Bureau of Foreign and Domestic Commerce, and the Bureau of Standards.

Among the other monographs edited, special mention should be made of the six commercial handbooks on the Netherlands East Indies and British Malaya, on the Mexican West Coast and Lower California, on Rumania, on Tunis, on Palestine, and on Portuguese East Africa. In all, six publications were issued in the special agents series, eight in the miscellaneous series, and three in the special consular series.

Seventy-nine trade information bulletins have been published during the fiscal year 1923. The fact that their contents are of a character to appeal to business men is evident from such titles as The German Industrial Situation, Aspects of British Business, Commerce and Finance in Czechoslovakia, Petroleum Trade and Industry of the United Kingdom, Foreign Markets for Radio-Telephone Apparatus, Protesting Drafts in Latin America, and Selling American Goods in British India.

The work of the editorial division, of which Griffith Evans has continued as chief, was very greatly hampered by the inadequacy of the printing appropriation, and this situation was relieved only by a deficiency appropriation which became available in March.

FOREIGN SERVICE DIVISION.

The work of the foreign service division has materially increased during the year and the staff has been augmented. Harold Dotterer became chief of the enlarged division of district offices early in the fiscal year, and Walter L. Miller took his place as chief of the foreign service division. Norman S. Meese entered the foreign service division as assistant chief to supervise the preparation of the quarterly reviews of the work of the foreign representatives. This work has been systematized and extended until at the present time these reviews serve as the primary guide to the field officers.

During the fiscal year the bureau established new foreign offices in Calcutta, Manila, and Sao Paulo (Brazil), while the office at Vladivostok was closed.

The monthly cabled and mailed reports of economic conditions in the United States, which is prepared in the foreign service division, has become of such value to the foreign representatives that the allotment for this cable service was increased and the length of the cablegram was doubled.

Early in the year a committee was organized, of which the chief of the foreign service division was appointed chairman, to review all inquiries which were being sent to more than one foreign office. The functions of this committee have continued throughout the year, and now all inquiries sent abroad are closely scrutinized in an effort to coordinate the demands made upon the foreign service.

The enormous increase in cable communication between the bureau in Washington and the foreign service has necessitated the establishment of a cable section in the foreign service division.

DISTRICT-OFFICE SERVICE.

The fiscal year was started with 7 district and 23 cooperative offices of the bureau. In July a new cooperative office was established in the San Diego (Calif.) Chamber of Commerce, and in August a regular district office of the bureau was opened in Atlanta, Ga. A new district office was also opened in Philadelphia, Pa., in October, making a total of 9 district and 24 cooperative offices.

There has been an increase of more than 100 per cent in the number of commercial inquiries handled by the district offices, there being 719,365 in the fiscal year 1923, as compared with 338,665 in 1922. The number of callers desiring information mounted from 51,497 to 63,561, while 178,153 trade lists and 325,051 sheets of reserved information on trade opportunities were given out by the district offices.

The need for the new district office in Philadelphia has been demonstrated by the past nine months of its operation; the inquiries have increased from 130 for the first week of October to more than 1,000 for the last week in June. In its work of educating the business community as to the services rendered by the bureau, the Philadelphia office circularized its entire Exporters' Index at least 12 times. This new office has cooperated closely with numerous Philadelphia commercial bodies.

The Atlanta Chamber of Commerce assigned space in its building to the bureau's new district office in that city, and that organization has cooperated most cordially with the district manager.

Many business men from foreign countries were introduced to firms in this country by the district offices, and in numerous instances large orders and important trade connections have resulted.

All the offices are called upon to make special investigations in connection with the trade-complaint work of the division of commercial laws. The endeavor is to effect an amicable adjustment without antagonizing American exporters, and in more than half the cases this result was attained.

The district offices in the port cities have arranged to have the steamship companies display on their bulletin boards notices asking foreign business men visiting the United States to call at the bureau's district offices.

Through arrangements made between district offices and various radiotelephone stations foreign-trade information from the bureau is now being broadcast throughout the United States.

The bureau contributed greatly to the success of the New England foreign trade meeting, held in Boston in May. One day was devoted entirely to addresses and conferences by the director of the bureau and division chiefs.

In the late fall of 1922 the Cleveland cooperative office arranged a foreign-trade meeting for bureau representatives, at which the director and seven division chiefs were present. It was attended by many Cleveland business men and proved very successful. A second meeting was held in April, and a few weeks later a similar meeting was arranged by the Rochester cooperative office.

DIVISION OF CORRESPONDENCE AND DISTRIBUTION.

This division, of which Royal H. Brasel has continued as chief, comprises two distinct sections, "correspondence" and "distribution."

In the first-named section is centralized the supervision of the incoming and outgoing correspondence of the bureau. About 136,000 incoming letters were routed in the division during the fiscal year 1923, as compared with 116,000 during the preceding year. Nearly 120,000 outgoing letters were examined during the year, against 102,000 in 1922.

The division carries on a correspondence of its own, including letters relating to the administration of established policies; the Exporters' Index (a classified file of American firms and individuals interested in foreign trade); requests for bureau publications, general trade opportunities, and other confidential information; mixed inquiries on various subjects; the general services of the bureau; and subjects requiring the attention of three or more divisions.

This division keeps records showing the volume of commercial inquiries answered by the bureau and its branch offices in this country. These show a remarkable increase as compared with the previous year. The inquiries recorded for 1923 numbered 972,702, as compared with 589,533 for the fiscal year 1922.

Requests for the information reserved from "Foreign trade opportunity" announcements totaled 332,127, or more than double the number taken care of in 1922, which was 127,385. The number of trade lists (of prospective foreign purchasers) supplied to American business men increased from 71,900 to 181,049.

The distribution section has maintained mailing lists for the distribution of publications and circulars; has mailed each month nearly 200 separate statistical statements, to more than 12,000 names; has distributed printed and mimeographed material to the bureau's 33 district and cooperative offices; and has supervised the mechanical and physical details connected with the Exporters' Index.

A revision of the bureau's Directory of Commercial and Industrial Organizations of the United States was prepared in this section during the year, the new compilation showing more than 11,000 names.

A revision of the entire mechanical system of handling the Exporters' Index was devised, and the work of changing over the index to conform to this new plan has progressed rapidly during the latter part of the fiscal year. The new commodity classification contains about 10,000 items, while the one formerly in use included 4,200.

Confidential and special circulars sent out during 1923 numbered 1,065,006 copies, comprising 1,184 separate statements, as compared with about 350,000 copies, involving 744 separate statements, in the fiscal year 1922.

The number of copies of "selling letters," inviting attention to special publications issued by the bureau, increased from 106,000 to 187,000.

A task of considerable magnitude completed during the year was the revision of the mailing lists for special monthly statistical statements.

RECOMMENDATIONS.

There are still a number of serious weaknesses in the bureau's service in spite of the extensive reorganization program which has been in process since March, 1921. The following recommendations are offered in this connection:

1. The field force should be considerably strengthened. The present network of 30 offices abroad leaves uncovered by the bureau's

staff at least 30 important trade centers in each of which American merchants are demanding prompt and practical information and advisory service, which we are not now in a position to give.

During the last two years the Washington staff has been developed to a point where it is capable of giving expert direction to the foreign staff in the collection of information desired by American business men and of digesting and distributing such information when it is received in Washington, but in the meantime the foreign staff has not been proportionately strengthened with commodity and other experts to meet the demands of the trades as transmitted by the home office. Funds should be made available at once to enable the foreign offices of the bureau to meet the rapidly growing demands of the business community, which are now coming in at the rate of over 3,300 inquiries a day, as against about 500 a day in 1920. All existing offices are seriously understaffed and new posts or branches are needed at the following points:

Europe:

Glasgow.
Dublin.
Liverpool.
Manchester.
Lisbon.
Marseille.
Lyon.
Hamburg.
Leipzig.
Christiania.
Stockholm.
Helsingfors.
Budapest.
Bilbao.

North and South America:

Ottawa.

North and South America—Continued.

Montreal.
Port au Prince, Haiti.
San Juan, P. R.
Caracas, Venezuela.
Central America.
Guayaquil.
La Paz.
Montevideo.
Valparaiso.
Para.
Trans-Pacific:
Auckland.
Hankow.
Harbin.
Singapore.
Bombay.

The regional divisions, which are charged with the guidance of the field force in their respective areas, should be correspondingly strengthened.

2. The district or branch offices in the United States, the "service stations" of the bureau, are likewise far behind the Washington staff in their expansion to meet the increasing requirements of business. In fact, these offices will in the new fiscal year (1923-24) have the first increase in their appropriations which has been given them since 1921. Consequently they are almost literally swamped with the demands of their local clients. The more than fourfold increase in their work in the past two years, with less than 20 new clerks added to the personnel of the 9 offices in that time, has been borne only because of long hours of loyal devotion on the part of the staff.

It is therefore recommended that a number of new offices be established and that the old offices be strengthened along lines that experience has shown to be urgent. It should be remembered that the function of the district office is to maintain immediate and personal contact with local firms actually engaged in foreign trade and constantly confronted with problems upon which they need prompt advice. The quality of the service rendered by these offices has been improved immensely in the last two years, but the demands upon them seem to multiply out of all proportion to the expansion of their facilities.

3. The \$50,000 appropriated for the creation of the division of domestic commerce during the coming fiscal year will, without any question, demonstrate the need for a service intended to eliminate wasteful practices in domestic commerce along lines somewhat similar to the help now rendered in foreign trade. The ability of the bureau to take an effective part in recent crises in the coal industry and in transportation because it had on its commodity staff highly qualified experts in those lines has been convincing proof that equally well-qualified experts in other commodities could render unique service in the distribution field that would not in any way duplicate or overlap the activities of any other organizations, public or private.

4. The statistical service of the bureau should be speeded up considerably if it is to be of practical value to business. The bureau is now announcing the exact imports of synthetic organic chemicals at New York within 48 hours after the close of the month, and a somewhat similar service is given the manufacturers of certain electrical supplies. This service has been very greatly appreciated by the chemical and electrical industries, but there are 20 or more industries which are entitled to similar service. It is essential that in competitive crises, such as are now apparent both at home and abroad, the American manufacturer should have the speediest possible information on the shipments of his foreign competitors.

Furthermore, our statistical staff should be strengthened so that it might prepare foreign trade figures covering parcel-post shipments and exports by States of origin.

5. Although it is not thought advisable to multiply further the number of independent divisions in the Washington office, it is obvious that certain existing divisions must be enlarged. Additional experts are badly needed to assist in the technical work of the divisions of commercial laws and foreign tariffs, as changes in tariff laws and other legislation vitally affecting American trade abroad are taking place so rapidly that these two divisions are finding it increasingly difficult to keep abreast of the demands made upon them by American exporters. There should also be added to the existing

commodity divisions a number of practical men from the industries who can render specialized service to the exporters of several important commodities which are not yet covered adequately by the staff, such as hardware, musical instruments, dyes and fine chemicals, paints and varnishes, jewelry, and motor cycles.

6. Legislation is needed on several matters of interest to the bureau. Our foreign agents should have more freedom in making leases of office quarters in accordance with the local laws or customs. The department should be authorized to accept contributions from individuals and trade associations to cover in part at least the costs of expensive special pieces of work. The expert accountants furnished to the bureau through the courtesy of the Comptroller General, who have been reorganizing our auditing department, have made valuable suggestions concerning legislation, with a view to simplifying our accounting. The conclusion of my report last year mentions the need of legislation authorizing the bureau to pay the expenses of sending its experts, accompanied by necessary exhibits, to participate in trade conventions, and also the need of legislation authorizing the collection of a nominal fee for enrollment of exporting firms on the Exporters' Index. Such legislation has not yet been obtained.

Very truly yours,

JULIUS KLEIN,

Director, Bureau of Foreign and Domestic Commerce.

BUREAU OF STANDARDS.

DEPARTMENT OF COMMERCE,
BUREAU OF STANDARDS,
Washington, July 1, 1923.

Hon. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request, I am submitting the following condensed report of the work of the Bureau of Standards during the past fiscal year:

GENERAL RECOMMENDATIONS.

It has become more evident each year that there are certain fundamental needs of this bureau which must be met as soon as possible if its activities are to be maintained on the high plane of efficiency which it has always occupied. It, therefore, seems appropriate, before reviewing the year's work, to present for your consideration the following general recommendations, which if carried out would, in my opinion, greatly increase the efficiency of the bureau:

ADDITIONAL LAND.

The main entrance to the bureau's property at present is through privately owned land, and it is urgently necessary to acquire this land between the present site and Connecticut Avenue to gain a suitable entrance and to make adequate provision for future development. This land is increasing rapidly in value, and it is in the interest of economy to purchase it at the earliest possible moment.

POWER PLANT.

In the interests of economy and efficiency in the generation and distribution of power and other facilities it is essential to erect a centralized power plant for the bureau. The present power service is in large part antiquated and is distributed among several buildings, which has been a necessary makeshift accompanying the growth of the bureau. It has long been necessary that a single modern plant be erected and equipped to meet the present needs and development of the bureau.

CARE OF BUILDINGS.

The number of janitors, laborers, and watchmen necessary to care properly for the buildings and grounds is quite inadequate, there being, for example, at the bureau one janitor per 25,000 square feet of floor space, as compared with the average of 1 per 10,000 square feet in the Government service.

PERSONNEL.

The greatest need of the bureau is the securing and maintaining of scientific and technical personnel of high grade to whom salaries should be paid commensurate with those obtaining in competitive occupations. It has been found impossible to fill certain very important positions in the bureau, including several division chiefs, with the grade of men desired because of the low salary scale. It is very important that the proposed new reclassification schedule be put into effect at as early a date as possible to remedy this situation.

PRINTING AND PUBLICATION.

The expansion of the bureau, due to extended activities in the specification field as well as the increase in normal output relating to scientific and technical investigations, will require additional funds for printing, and it is recommended that an effort be made to increase the bureau's allotment for this purpose, as it seems evident that it is highly desirable to make available to industry, satisfactorily and promptly, the results of the bureau's work.

NEW LEGISLATION.

In view of the fact that questions of maintenance, operation, care, and protection are so closely interrelated with the conduct of technical investigations in the laboratories that it is impossible, for example, to distinguish between the fuel used for heating and lighting and that for the conduct of experimental work, it is earnestly recommended that the act of Congress approved February 13, 1923 (42 Stat. 1239), turning over these functions and appropriations to the Superintendent of the State, War, and Navy Department Buildings be repealed in so far as it relates to the Bureau of Standards.

The bureau is also interested in legislation relating to uniformity in weights and measures, the use of clinical thermometers, the betterment of railway track scales, and the uniformity of loaves of bread on the basis of weight.

ADDITIONAL FUNDS FOR RESEARCH.

To keep pace with the urgent demands of industry for the support of fundamental research on which the progress of industry and the prosperity of the country depend, it is highly desirable to urge upon the Congress the need of supporting experimental research on a more extensive scale at the bureau. It is well recognized that the brunt of the cost of industrial research should be borne by industry; nevertheless, there are many important problems of a fundamental nature common to industry which can be handled best by the active participation of a public research institution, such as the Bureau of Standards; and it is in the public interest that many such problems be developed by the participation in their solution of a governmental laboratory. I am, therefore, urging substantial increases in the estimates for the coming year.

RELATION OF THE BUREAU TO AMERICAN INDUSTRIES.

It is particularly gratifying to note the closer relations which are growing each year between the bureau and the industries of the country. Not long ago it was a matter of considerable difficulty to obtain the cooperation of industrial groups in the small amount of research work then carried on by the Government. Now problems are presented to us by almost every industry of the country, and their successful solution depends very largely on the degree of cooperation between those presenting the problem and the bureau. The former are the best judges of the commercial aspects of the question and can give invaluable advice on the practicability of suggested processes, while the latter is best qualified to lay the sound foundation of scientific and technical data upon which the solution of such questions depends.

As an illustration of the desire of industry to cooperate with the bureau I may cite the case of the joint committee on welded rail joints, of which I am chairman, which committee, through the American Electric Railway Association, has raised \$23,000 which is being used to finance the construction of a test track and other apparatus for research at the bureau. I am also chairman of the joint committee for the investigation of the effects of sulphur and phosphorus in steel, a problem of great economic as well as metallurgical importance; chairman of the Annual Conference of Instrument Manufacturers and Users; and of the Annual Conference on Weights and Measures.

The engineering public has also shown its confidence in the bureau by electing me as president of the American Society for Testing Materials, and also of the Society for Steel Treating, and an honorary member of the American Foundrymen's Association.

Approximately 100 conferences were held during the year between representatives of industrial associations, the various branches of the Government, and the Bureau of Standards for the solution of fundamental problems and for the purpose of mapping out and directing cooperative research programs. Several of these meetings were held at the bureau, and in this way, besides discussing the immediate questions at issue, an excellent opportunity was afforded manufacturers and others to become acquainted with the bureau's research facilities.

In line with this policy of closer cooperation a system of research associates has been worked out and several of the most important industries are maintaining such associates at the bureau for carrying out particular investigations in which they are interested. In nearly every case these research associates are supported not by a single manufacturer but by a group through their trade association, and the results which are published by the bureau are available to the public at large. In this way the facilities of the bureau's laboratories and the experience of its scientific staff are made of benefit to the maximum number of people throughout the country, and incidentally men are trained for the industries in research methods. There are at present stationed at the bureau 21 associates representing 18 industries.

SPECIFICATIONS.

FEDERAL SPECIFICATIONS BOARD.

The Federal Specifications Board, of which the Director of the Bureau of Standards is ex officio chairman, was organized under authority of Circular No. 42, Bureau of the Budget, dated October 10, 1921. Its purpose is to coordinate and promote economy in the procurement of materials and services used by the Government under specifications prepared by the various branches thereof, and to avoid duplication of effort between departments, thus making for the better utilization of industrial resources.

The duties of the board are to select or compile, adopt, and promulgate standard specifications for the use of all departments and independent establishments of the Government. Many members of the technical staff of the Bureau of Standards serve on the various committees of the board in the preparation of specifications. At the present time there are 47 technical committees at work on the principal commodities purchased by the various departments of the Government, and 62 standard specifications have been promulgated to date, and many more are in process.

DICTIONARY OF SPECIFICATIONS.

At your suggestion, there was recently started at the bureau the compilation of a dictionary or handbook of specifications for supplies purchased by Federal, State, and municipal governments and public institutions. For this purpose a comparison is being made between the specifications prepared by the various departments and independent establishments of the Federal Government and those used by State and municipal governments, public institutions, and the important national trade associations and technical societies. Correspondence conducted with the purchasing agents of a large number of municipalities and public institutions has given confirmation and emphasis to the findings of the meeting of State purchasing agents held in Washington on May 25, 1923, at which the need of public purchasing agents for reliable, nationally recognized specifications was discussed, and it was voted unanimously to cooperate in the selection, unification, or preparation of specifications for the commodities purchased by the local governments.

In accordance with the recommendation of that meeting the National Association of State Purchasing Agents is making a canvass to determine the more important commodities for which specifications are urgently needed by the State purchasing agents. Statistics are also being gathered to show relative monetary value of the commodities purchased by the Federal Government. As a result of the conference on June 11 of representatives of various technical and other national associations vitally interested in both the preparation and use of specifications, there was organized a committee to act in an advisory capacity in carrying out the plans of collecting material for and publishing the proposed handbook. The work is being carried out in such a manner as not to duplicate any existing machinery for selecting, modifying, or preparing specifications, but rather to utilize fully all such machinery and help it to become more effective.

TRANSLATION INTO SPANISH OF THE STANDARDS OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

The Bureau of Standards, at the request of the American Institute of Electrical Engineers, has completed a draft of a translation into Spanish of the Standards of the Institute (1922 edition). This draft of the translation has been accepted by the standards committee of the institute, which has authorized the printing and sale of the completed translations. The purpose of this edition will be to promote foreign trade through a better understanding abroad of the technical standards on which American electrical practice is based. The trans-

lation will be sold to the profession for use in Spanish-speaking countries.

COOPERATION WITH TECHNICAL ORGANIZATIONS.

NATIONAL SCREW THREAD COMMISSION.

This commission, of which the Director of the Bureau of Standards is ex officio chairman, has been active during the past year, holding monthly meetings, and has in preparation a second report.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

The director represents the Bureau of Standards on this committee, which has the direction of the Government work relating to aeronautics.

There has been active cooperation with the American Engineering Standards Committee and the National Research Council on many questions of national importance in the engineering, scientific, and technical fields. Many members of the bureau are also active on numerous committees of the various technical and scientific societies.

SIMPLIFIED PRACTICE.

The work of the division of simplified practice has progressed rapidly during the year, and it is particularly gratifying to note that this has been carried out almost entirely in response to demands from industry and business. Effort has been made to furnish information which is of national importance, thus serving the maximum number of industries.

Forty-five conferences have been held in Washington, many formal addresses have been given at various other places, and 22 articles published in the news, trade, and general press. In addition, the division has been represented at 50 other meetings of business committees or conventions, and very great interest was shown in the work.

The series of simplified-practice recommendations now includes nine items. Two of these, covering paving bricks and bedsteads, springs, and mattresses, respectively, have been requested in printed form by a very large number of interested purchasers, distributors, and consumers. The remaining seven recommendations are in process of formal acceptance, and it is expected that they will be published in the early fall. The commodities covered are metal lath; paint, varnishes, and containers; hotel chinaware; asphalt; face brick; paper; and wire fence. In each of these cases very great reductions have been made in the number of sizes and styles, which will henceforth be considered as standards.

In cooperation with the lumber industry, work is in progress on the standardization of nomenclature, grades, and sizes, while the

makers of farm implements are carrying on a comprehensive program on the simplification and standardization of their products.

Somewhat similar work is under way in cooperation with the hardware merchants; distributors and users of glass, paper, metal, and wood containers; and flag manufacturers.

A committee of the Hollow Building Tile Association has requested the division's assistance in reduction of types, sizes, and weights of hollow building tile, and the Concrete Products Association and the American Concrete Institute have presented their recommendations for the reduction of variety and sizes of structural and partition units made from concrete.

The formation of the American marine standards committee, at the suggestion of the American Marine Association of New York, N. Y., in cooperation with the division of simplified practice, opens a large field of activity.

BUILDING AND HOUSING.

The work of the division of building and housing has been carried out actively during this second year of its existence. Throughout its activities, and particularly in connection with building codes, plumbing codes, and city zoning, the division has obtained the cooperation of trade associations; professional, scientific, and civic societies; and other bodies of citizens interested in construction, housing, and civic improvement. The cooperation of such organizations has made it possible for the division to accomplish a variety and amount of work which would have been impossible otherwise with the staff at its command, and has also made the results of maximum benefit throughout the entire country. The building code committee published its first report covering recommended minimum requirements for small dwelling construction last January. It is expected that general adoption of the code will result in substantial conservation of materials and the saving of many millions of dollars. The code with its appendix forms a manual of housing construction that can be used as a handy guide to good building practice by anyone at all familiar with construction work.

The plumbing code committee practically completed its report on installations for small houses, which will be published during the fiscal year. It is believed that this report will furnish a scientific basis for small-house installations which, if generally followed, will insure sanitary systems and secure savings over the practice required at present by the majority of codes.

The advisory committee on zoning completed and issued its standard State zoning enabling act which permits cities to zone. This was used as a basis for bills introduced in 11 State legislatures early in

1923, and several of these acts were passed. It is hoped that the more general use of this bill will simplify the legal status of zoning in the United States.

The collection and publication of building-material prices and other current statistics have met with increasing commendation from the industry. A special study was also undertaken of the building situation in March, 1923, and an article was prepared on construction in 1922, with a special section devoted to the housing situation.

At the close of the year an investigation of seasonal operation in the construction industries was undertaken in cooperation with a committee of the President's conference on unemployment.

Assistance was given during last October and June to the "Better homes in America" movement. Demonstration homes were conducted in several hundred cities during each of these periods, and it is believed that they had an important educational effect. A number of articles for the guidance of home seekers was also prepared by the division.

WEIGHTS AND MEASURES.

One of the members of the staff of this division spent the greater part of the year abroad studying the methods and equipment used by other standardizing institutions and obtained information of very great value. The national prototype meter was recompared at the International Bureau of Weights and Measures and was found to have maintained its length within the limits of measurement.

An important investigation is under way on the orifice meter of the type used in measuring large quantities of natural gas. Special equipment was necessary for this work, and this was taken care of by the courtesy of the War Department through permission to use a part of their equipment at Edgewood Arsenal. Preliminary tests have been made and the investigation will probably go forward rapidly during the coming year.

Good progress has been made in producing precision screws and graduated scales. The object of this work is to produce screws of such accuracy and uniformity of pitch as to make possible the construction of a linear dividing engine for ruling scales and gratings of higher accuracy than any now obtainable.

The bureau's scale-testing equipments tested during the year 636 railroad-track scales, 19 master scales, 140 mine scales, and 37 other heavy-duty scales.

The accuracy of the railroad scales shows in general a slight improvement each year which is very gratifying, but there is still room for betterment, particularly in certain sections. The bureau's work along these lines would be greatly facilitated by the provision of a suitable, centrally located depot in which to house the Govern-

ment's master track scale, and it is hoped that provision will be made for this building during the coming year.

Assistance is being rendered to State and municipal weights and measures officials and to manufacturers through the testing and investigation of commercial weighing and measuring devices. Unfortunately the bureau's facilities are not adequate to carry on all the work of this kind, which it would like to do. At present considerable delay is unavoidable in testing devices submitted, while the work, to be of maximum value, ought to be carried out promptly.

A bill has been introduced in Congress, largely through the effort of the Scale and Balance Manufacturers' Association, designed to secure uniformity of types of weighing and measuring apparatus for commercial purposes throughout the United States and giving to the Bureau of Standards the power to approve apparatus of this kind. This would result in increased protection to the general public.

The Sixteenth Annual Conference on Weights and Measures, held on May 21 to 24, was one of the most successful which has taken place at the bureau. Delegates were present from many sections of the country and papers on numerous important subjects were presented. In this way weights and measures officials become acquainted with each other's problems and with the work of the National Government. This goes a long way toward the securing of uniform weights and measures laws throughout the country.

ELECTRICITY.

Particular attention has been paid during the past year to the revival of fundamental investigations, such as the fundamental measurements of resistance, the ratio of the international to the absolute henry, and the use of the absolute electrometer for high voltages.

The importance of the electrical work of the bureau in the industries is well illustrated by the lamp inspections through which the Government's purchases of incandescent electric lamps are controlled, and the investigation and testing work on electric batteries, of which a large amount is now being carried on. Although the Government's purchases of electric lamps were smaller than usual this year, no less than 1,706 lamps, representing orders totaling 1,660,000, were subjected to life tests.

Radio communication is assuming a place of the first importance in the electrical field, and naturally a large part of the time of the division has been devoted to radio subjects. The bureau is endeavoring to aid in the commercial standardization of radio equipment, a progressive step of great importance and for which an excellent opportunity exists in this field owing to the newness of the entire

subject. Progress has been made in the development of precise frequency measurements and other investigations connected with the reduction of radio interference. The work on electron tubes and insulating materials will have a most important industrial application.

Numerous important conferences on radio subjects were held, particularly the one on March 20 to 24, which mapped out a system for administering radio laws.

As has been mentioned in the past, a part of the work of the division of electricity covers allied subjects, particularly those related to public utilities, and along these lines several important conferences were held which, it is hoped, will bring about even closer and more effective cooperation between the Bureau of Standards and State authorities.

The mitigation of electrolytic corrosion is a serious question in many localities, and the work which has been carried out and which includes not only actual field surveys but also the development of an improved earth-current meter is of very great importance.

In connection with safety codes, important progress has been made in preparation of new editions of the National Electrical Safety Code, and in the completion of a code governing logging and sawmill operations, and portions of the aeronautical safety code.

A great deal of attention has been given to gas-service standards and the improvement of the efficiency and safety of gas appliances. Considerable aid was furnished to municipalities by the bureau in solving some of these problems, and it is believed that real progress has been made in the elimination of faulty and dangerous appliances.

A revision of the bureau's circular on electric-service standards has been taken up and a complete survey of electric-lighting conditions throughout the entire country, with the ultimate object of standardizing equipment of this kind, is now well advanced.

The survey of the Bureau of Standards of the telephone service furnished to the various branches of the Government in Washington has resulted in improvement in the service and a saving of over \$62,000 in the amount spent. It is planned to extend this work to cover broader fields during the next year.

HEAT AND POWER.

The investigation of automobile brake linings, begun about two years ago in cooperation with the War Department, has stimulated manufacturers to continued improvement in their products. The average brake lining sold at present has more than twice the useful length of life of those marketed before this work was conducted by the bureau.

In connection with the program for the elimination of waste, work has been continued on the measurement of heat transmission of typical wall constructions. This is one of the important outstanding problems of the building industry, the correct solution of which may lead to very large savings in the cost of building construction. Heat transmission through closed air spaces, such as form a part of many types of wall, is being given special attention.

The establishment by mathematical and experimental means of a sound theory of atomic structure would be of immediate practical value in the whole range of technical research. Direct experimental tests, including measurements of the energy required for the different types of atomic disruption, and the study of the spectra of the resulting radiations have been in progress for five years. The measurement of radiations, beyond the range of spectroscopy, by electrical methods has been continued, and several methods of exciting radiation have been developed. A book on the Origin of Spectra has been published in which a general view of the entire subject is given.

Fire-resistive properties of building materials are being investigated with the object of developing methods for obtaining the required degree of fire resistance at minimum cost and minimum sacrifice of other desirable properties. To be of maximum value, tests must be made under practical conditions. A fire-test house is, therefore, employed which from time to time is fitted out with the various articles to be found in typical occupancies and is then burned out. Measurements are made of the temperature reached and the duration of the fire, as well as observations of the effect of the fire on objects and material in the house.

The results of the fire tests are reduced to terms most directly applicable in the design and construction of buildings and formulation and enforcement of building and safety regulations.

The computation of tables and preparation of four major papers describing previous experimental work on the thermodynamic properties of ammonia have been nearly completed. The portion of the ammonia tables already published has been reprinted by practically every journal devoted to the refrigerating industry, both in this country and in Great Britain.

An investigation of the relative merits of heavy-duty truck axles of 5-ton rating and of various sizes, begun earlier under the auspices of the motor transport division, Quartermaster Corps of the Army, has been concluded and may lead to a redesign of axles for military vehicles.

OPTICS.

Experiments have been carried out which seem to corroborate earlier conjectures that the process of annealing glass is not merely one in which the mechanical stress is relieved, but perhaps primarily one which permits and facilitates the formation throughout of definite molecular aggregates which characterize well-annealed glass.

A number of the chemical elements have been brought into the spectral series class which have heretofore, because of their very complex spectra, eluded all attempts at correlation.

An interferometer method has been developed for measuring refractive indices of samples no larger than 4 by 4 by 4 millimeters to an accuracy of one in the sixth decimal place, thus affording an effective means for investigating optical homogeneity and chemical purity of materials, as also for calibrating standard refractive index samples.

Two instruments of importance in photometry and colorimetry have been completed, tested, and found to function satisfactorily. One embodies the application of the principle of rotatory dispersion in producing what is effectively a specifically variable blue filter for eliminating color difference in the photometry of different light sources, and the other is a very complete monochromatic colorimeter which matches given colors by a given quality of white plus a definite quantity of a pure spectral line.

Cooperation with the American sugar industry has been continued, and progress is being made in solving one of the most important problems confronting the beet-sugar producers, namely, utilization of beet molasses.

Important work has been completed, and a paper is being published on the visibility of radiant energy—that is, luminous efficiency—and valuable work on the color grading of dyes and enamels has been carried out.

A thorough investigation of airplane camera lenses was completed for the Army Air Service, and some interesting data have been secured on the heat absorption and retention of roofing materials. Information has been published on a simple means for reducing the heat radiation into a tent or building by the use of aluminum paint on the inside of the roof.

CHEMISTRY.

The chemistry division has prepared a large number of specifications for paint, varnish, bituminous roofing materials, soaps and other detergents, and rubber. Over 8,000 tests were carried out on bid samples and deliveries by which the Government purchases are

regulated. The saving in money to the Government through this testing of its purchases is one of the most important services which the bureau is able to render the various departments. This work, while in some cases of a routine character, also involves the devising and development of new methods of analysis covering all sorts of materials.

During the past year some important work was also conducted on methods for the analysis of platinum ores and alloys and other metallurgical products.

In commercial electroplating it is important to secure as nearly uniform distribution of the metal coatings as possible, especially upon irregularly shaped articles. Solutions which produce good distribution are popularly designated as having good "throwing power." For copper solutions this property has been defined, and methods of measuring and controlling it were devised. A similar study of nickel solutions is in progress.

The internal structure of electrodeposits is important because it largely determines those properties upon which the usefulness of the coatings depends. Uncompleted investigations have led to the development of a tentative theory of the mechanism of metal deposition and of a simple classification of the crystal types existent in electrodeposition.

The investigation of methods of producing hydrogen for aeronautical purposes has been practically completed as far as its application to aeronautics is concerned. A plant to supply Scott Field is now being constructed by the Air Service according to our specifications. This plant will make hydrogen by the thermal decomposition of oil, which is the process best adapted to the intermittent production of hydrogen on a moderately large scale. Work upon the steam-iron process resulted in the development of an essentially new method of hydrogen manufacture which gives promise of great industrial possibilities.

To meet an important need in the refrigeration and chemical industries, a detector for water vapor was developed which is intended particularly for use in closed pipes. It depends upon the electrical conductivity of a thin film of hygroscopic electrolyte. The present instrument operates successfully over only a small range of vapor pressure, but it appears feasible to make one that will operate successfully over a wide range of humidities.

MECHANICS AND SOUND.

A study of elevator accident statistics shows that about three-fourths of the accidents fatal to the public occur at the hoistway door. A well-designed and reliable interlocking device will practically

eliminate accidents of this character. A series of tests of existing devices has been made on an experimental hoistway at the Bureau of Standards at the request of the city of Baltimore. The preliminary tests showed a surprisingly small number of interlocks capable of meeting reasonable requirements as to reliability and durability. The manufacturers of interlocks have taken great interest in this work and have improved the opportunity to redesign their interlocks to correct weaknesses which were developed, and the safety and reliability of elevator interlocking devices have been greatly advanced as a result.

The great need of information regarding the effectiveness of various building materials in preventing the transmission of sound is evidenced by the volume of inquiries received from architects and manufacturers of building materials. To meet this demand, a "sound chamber" has been constructed in which the sound transmission through panels representing standard types of building construction can be measured. An essential part of the program which has been completed is the development of highly sensitive apparatus for the quantitative measurement of the sound transmitted by the panels.

At the request of the engineering division of the Air Service of the Army an extensive program has been carried on during the year relative to the forces acting on airship models and the distribution of pressure over airship hulls, for use in connection with the design of a semirigid airship now being developed by the above service. From model investigations of this kind, carried out in the wind tunnel, the performance and stability of the full-scale airship can be predicted and the design so modified as to give the desired performance, thus effecting a great saving in both time and money.

At the request of the Navy Department, special attention has been given during the year to the development of navigating instruments for the new Navy airship *ZR-1*. Twenty special instruments have been constructed for use on this airship, including air speed meters, landing altimeters, statoscopes, rate-of-climb indicator, turn meters, gasoline-flow meters, and a pressure-alarm device for indicating excessive pressure in the gas bag.

Government specifications for wood screws have been adopted and 47 per cent of the former sizes eliminated by joint action with the industry. Comprehensive Government specifications for builders' hardware are nearing completion. A number of committees of manufacturers are rapidly standardizing builders' hardware within the industry and including hardware for hollow metal doors. A report of test on the relative wearing value of ball-bearing and steel-bushed bronze butts has been issued.

STRUCTURAL ENGINEERING AND MISCELLANEOUS MATERIALS.

Some very interesting work was conducted during the year on special column sections of the type to be used for the new Delaware River suspension bridge between Philadelphia and Camden. These specimens were submitted by the Delaware River Bridge Joint Commission, and in the testing of them a new form of electrical strain gauge designed and constructed at the bureau was employed. The investigation has resulted in some valuable information on the failure of a stiffened column section and the comparative action of single and double webs in built-up steel columns.

The preliminary arrangements have been completed for a thorough investigation in cooperation with the American Railway Association and the American Bureau of Welding of the tensile strength, electrical conductivity, and impact resistance of various types of welded rail joints. Special grips for use in the large testing machines have been designed, and a circular track, containing joints of the different types over which a truck will operate, is being laid down.

In cooperation with the American Bureau of Welding an investigation has been completed on the strength of welded pressure vessels. This work will be used by the American Society of Mechanical Engineers in preparing a safety code for this class of construction.

The bureau's work on the durability of concrete in alkali soils was continued and several new lengths of experimental drain installed near Montrose, Colo. Examinations were made of other drains and concrete blocks which have been exposed for several years.

Weathering tests are in progress on various typical building stones, and experiments have been carried out to determine whether the disintegration of stones produced by the crystallization of salt can be employed as an accelerated weathering test.

An important investigation, in which commercial cement plants have cooperated, has been carried out on the effect of burning and composition on the properties of finished cement. The work, as far as plant operation is concerned, was completed during the year, and apparently some valuable data have been secured. This work will cover a period of several years, so that all results will not be available for some time, but it is expected that information of value, particularly on the action of alkali on cements, can be reported each year.

Work has been continued on synthetic tanning materials. Observations made during the year have shown that by themselves these substances are not suitable for making leather, since they lack the filling properties of ordinary vegetable tanning materials. In combination, however, synthetic materials have valuable properties, and a thorough investigation along this line will be carried out.

Tests have been made on approximately 100 different makes and sizes of tires to determine the power losses under various conditions. Many tests have also been run on the endurance machines to get some idea of the life of tires under conditions comparable to road service.

Two very important investigations, from the industrial point of view, which will be taken up during the coming fiscal year, and for which research programs have already been mapped out, deal with synthetic tanning materials and the use of reclaimed rubber.

An investigation will be conducted on the production of synthetic tanning materials from coal-tar products, involving actual manufacture and development of processes, with reference to methods of sulfonating, condensing, mixing, and diluting.

A thorough study will be made of the various methods of reclaiming rubber, with the object of developing more efficient production processes and a better quality of product. Investigations leading to a more extended use of reclaimed rubber, involving practical tests of rubber goods, especially automobile tires containing different percentages of reclaimed rubber, will be carried out.

The apparatus to be used in measuring the heat-retaining properties of fabrics has been completed and a description of it prepared. The problem itself will require additional work, but when completed will give results of great value to manufacturers of blankets and clothing.

In cooperation with the Bureau of Foreign and Domestic Commerce, an investigation was made of the use of rubber latex in paper. The results indicated that this material had no definite effect on the strength of the paper, and that certain difficulties existed in connection with its use.

Some successful experiments were carried out on the making of paper from flax straw, vast quantities of which are available in the Northwest and in Canada. It is doubtful, however, if this material can compete with more usual substances, with prices at their present level.

A study has been made of methods to produce the quick setting of lime, so that this material can compete on a more nearly equal basis with gypsum. A mixture of ground quicklime and hydrated lime has been found successful if made into building blocks at the factory, since the mixture will not keep well when shipped.

Work has been continued on improving the plasticity of hydrated lime, and this year special attention was paid to the development of a process for producing finishing hydrate as the original product instead of masons' hydrate. It is believed that the question can be solved successfully.

METALLURGY.

Substantial progress has been made, in cooperation with a joint committee, in the determination of suitable and safe limits for sulphur in steel; the investigation on rivet steel is about completed and the study of plate and forging steels is well under way.

An investigation is being carried out, with the advice of a committee representing industry and the Army and Navy, on the improvement of the durability, permanence, and process of manufacture of precision steel gauges and on the resistance of various gauge steels to wear.

The investigation of thermal stresses in car wheels was completed, and the results published by the bureau.

A thorough study is being made of the corrosion of so-called non-corrodible steels, both in distilled water and dilute hydrochloric acid. The work is still in progress and will be extended to include other kinds of acids during the coming year.

Heretofore there has been a great deal of uncertainty in interpreting the results of the nick-bend test for wrought iron. For this reason an investigation is in progress to determine the exact meaning of the different kinds of fractures which may be obtained from this test.

The mechanical properties of metals at elevated temperatures are being studied, this work including a study of the tensile properties of steels of various carbon content and when alloyed with different metals. Forging and compression tests of steel are also being carried out.

In cooperation with the United States Naval Gun Factory, a large number of lathe breakdown tests were made on high-speed steels and a technologic paper has been issued on the subject.

The study of the resistance of steels to wear is being continued, the various preliminary treatments which affect the wear of steel have been studied, and it appears that maximum hardness does not necessarily give the greatest resistance to wear.

The results of investigations on the mechanical properties in compression of white bearing-metal alloys at normal and elevated temperatures have been published.

Some very important work has been done in connection with the determination of oxygen and hydrogen in metals, and the development of the vacuum fusion method has been brought to a very satisfactory stage. Progress has been made on the method for determining nitrogen in metals by fusion in vacuum and by absorption of nitrogen in the evolved gases by metallic calcium vapors. The metallurgical industries have shown great interest in these researches on gases in metals.

Some very pure platinum has been produced and studies have been made of the various metals of the platinum group. In connection with this work several special studies of the refractories used for crucibles in which the metals are melted, as well as improvement in the furnaces used, have been made.

The investigation of foundry molding sands is progressing with the active cooperation of a joint committee on this subject.

In cooperation with the War Department the erosion of machine-gun barrels has been studied, and a series of physical and ballistic tests was carried out on 25 alloy steels recommended as suitable for service of this kind.

Work has been carried out on the development of light armor plate in cooperation with the War Department, the particular problem being the preparation of specifications which will express in physical terms the properties which such a plate should possess.

CERAMICS.

In cooperation with the United States Potters' Association, an investigation has been started on the effect of different compositions and temperature conditions on finished chinaware. Specimens have been fired at various plants and sent to the bureau for test. These tests have shown the serious effects of under and over firing on the finished bodies.

Service and laboratory tests have been conducted on tableware with the object of preparing specifications for this material. In this work valuable cooperation is being given by the American Hotel Association and sets of china are being tested in service at several prominent hotels.

The first phase of an important investigation of architectural terra cotta is nearing completion. The physical properties of many typical bodies have been determined. Striking differences in permeability have been shown, but no consistent relation between permeability and water absorption values has yet been worked out. The work, which is being conducted in cooperation with the National Terra Cotta Society, will be continued.

Many successful melts of optical glass have been made and at the same time data have been accumulated on the complicated technique of optical glass manufacture. Approximately 12,000 satisfactory optical blanks were molded by the "sticking-up" process.

A study is being made of sheet metal enamels for kitchen ware to determine the resistance of these wares to impact, acids, and quenching, with the object of preparing specifications covering articles of this class.

OFFICE.

The office work of the bureau is much more complicated than is the case in most institutions because of the varied, technical character of the subject matter handled and the extremely valuable property which must be accounted for.

During the year the division handled the accounting for nearly \$2,000,000 receipts and expenditures for equipment, supplies, personnel, travel, and general expense; had charge of the personnel action and records for the staff of more than 900 members; and kept the accountability records and actions affecting more than 100,000 pieces of apparatus, equipment, tools, and furniture, besides the procurement, storing, and distribution of more than 4,000 varieties of scientific and other supplies.

The incoming and outgoing mails of the bureau amounted to over 250,000 communications, and the work of the library, which now consists of 25,000 volumes and 616 scientific and other periodicals, published in 12 different languages, requires an unusual familiarity with the scientific and technical literature of the entire world.

There is maintained a catalogue library of 15,000 volumes giving information on the best sources from which to obtain almost every variety of supplies.

A total of 91 publications in the various series of the bureau were published during the year, and a great deal of editorial work was carried on in connection with the preparation of new papers.

A large amount of general information which does not appear in print is also furnished in answer to special inquiries, and during the past year an unusually large number of questions by mail, telephone, and personal visits were answered directly from the office. Several more or less popular articles were also prepared dealing with the bureau's work.

ENGINEERING AND CONSTRUCTION.

As in the case of the office work, the engineering and construction work carried on at the bureau is of a very complicated nature and requires a plant much more elaborate than would be the case in any manufacturing concern.

During the past year necessary repairs have been kept up and the service considerably improved by the installation of certain electric equipment, new boiler feed and fire pumps, and a refrigerating plant in the industrial and kiln buildings.

The decentralization of the bureau's power plant is, however, a very great disadvantage and substantial improvement can be expected only if a suitable central plant is provided.

A great many repair jobs in connection with the electrical, plumbing, and steamfitting work about the bureau were carried out, and some new equipment has been installed. Some of the construction work completed has been quite elaborate, such as the installation of foundations for the large testing machines in the Industrial Building, the building of a concrete sound screen, and the commencement of the alterations on the bureau's high-tension laboratory.

Some work has been done on permanent roads and on the improvement of the bureau's grounds, but the funds available have not permitted very much progress along these lines.

TESTS.

Approximately 128,000 tests were completed by the bureau during the fiscal year; 30,000 thermometers were tested; 1,608 incandescent lamps, representing 1,640,485 purchased by the Government, were subjected to life tests; and 6,700 weights and 33 balances were examined to see if they complied with the tolerances of the bureau. Sixty-two electrical measuring instruments, 10 wavemeters, 18 decimeters, 455 water current meters, and 100 aeronautic instruments of various kinds were also tested. Cement tests totaled 5,200, and 3,447 tests were made on radium and radioactive materials.

The above listed materials and devices tested in the bureau's laboratories, selected at random from the complete test records, give a very good idea of the variety and importance of this phase of the bureau's work.

Very truly yours,

GEORGE K. BURGESS,
Director, Bureau of Standards.

BUREAU OF FISHERIES.

DEPARTMENT OF COMMERCE,

BUREAU OF FISHERIES,

Washington, July 1, 1923.

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:

COMMERCIAL FISHERIES.

The depression that existed in the fisheries industries in 1921 was to a considerable extent relieved in 1922 and was replaced in the early part of 1923 by decidedly better conditions. In the New England vessel fisheries in the calendar year 1922, 11.9 per cent fewer trips were made than in 1921, but the catch increased 6 per cent. During the spring of 1923 the catch was generally greater than for the corresponding period of the previous year, and the price was materially higher. In the canned salmon industry of the Pacific coast there was an increase of 45.4 per cent in the number of cases packed and 33.1 per cent in the total value of the product. This was accounted for entirely by the large increase in Alaska of both quantity and value, there being a marked decrease in the pack elsewhere. Substantial increases also occurred in the sardine packs of Maine and California, the tuna pack, and the production of fish oil and other by-products.

A market survey was made of our largest fishing port, Boston, Mass., which brought forth interesting and valuable facts. Perhaps the most significant finding was that 56 per cent of Boston's production of fish is consumed in Massachusetts, and 89 per cent in Massachusetts and neighboring States, to and including Pennsylvania, indicating that the great inland potential market is all but untouched and that any material increase in the total consumption of sea foods must come largely from the development of markets in those parts of the country more distant from the seaboard.

The reasons for the absence of a market for fish in the interior appear to be lack of effective organization of the fish industry and inadequate technical methods of delivering perishable fishery prod-

ucts to these markets in such condition that they may command a ready sale. It is for this reason that the work which has been in hand for some time on refrigeration of fish is considered of much importance. The effort to develop a process of freezing fish in brine, mentioned in last year's report, has been carried forward as rapidly as extremely limited resources have permitted. The experimental plant has been constructed and has been undergoing tests to determine its operating characteristics and to develop such changes and improvements as may be necessary for meeting the exacting requirements for commercial use. The plant, which is essentially a tunnel through which the fish are conveyed while showered with very cold brine, operates continuously, and performs washing, freezing, and glazing automatically and in the minimum time. As it embraces radical departures from previous attempts to apply the advantages of brine freezing to fish, much experimentation has been necessary to perfect some of the seemingly minor features.

The technological work on the preservation of nets has gone forward satisfactorily. A new preservative—copper oleate—has been found in the course of these experiments which promises to be decidedly better than other materials previously used. During the present season this preservative is being tried by many fishermen in different localities and close watch is being kept on the results. Certain objectionable qualities that have come to light in practice are being studied with a view to eliminating them. These qualities are the lubricating effect of copper oleate, which causes the knots in the web to slip, and the tendency of the preservative to wash out. It now appears that both difficulties may be satisfactorily overcome by the addition of a small quantity of boiled linseed oil to the solution of copper oleate.

The technological work for the improvement of the methods employed in canning sardines has been continued without interruption. The conclusion having been reached that the fry bath oil, used for frying the sardines, imparts an objectionable taste to the product, the problem was presented of devising means for packing the fish without its use. Three substitutes for the fry bath in removing the excess water from the fish have been suggested by the investigation and tests of their comparative merits are still in progress.

Good progress has been made in the statistical work of the bureau. Heretofore it has never been possible to canvass the fisheries of more than a very small part of the country in any one year with the force available, but the experiment is being tried of detailing for the work men from the various hatcheries and other field stations of the bureau at such times as they may be spared without detriment to their regular duties. By following this course it has been possible simultaneously to carry on canvasses of the Great Lakes, the Missis-

sippi River and tributaries, the Pacific Coast States, and the shad and alewife fisheries of the Potomac River. In addition the canvass of the canned products and by-products of the fisheries was carried out and the results published in a bulletin which has attracted much attention. The usual statistical bulletins were published, and also the special bulletins covering the fisheries of New York, New Jersey, Pennsylvania, and Delaware. The monthly reports showing the amount of fish frozen and held in storage, supplied by the Bureau of Markets and Crop Estimates of the Department of Agriculture, have been published regularly. A quarterly canvass of the production of oils from fish and marine animals, formerly conducted by the Bureau of the Census, has been made by the Bureau of Fisheries for the past year, and the results turned over to the Bureau of the Census for publication in its regular report on oil production.

ALASKA FISHERIES.

The salmon industry of Alaska returned practically to normal in 1922, after the very small output of the year previous, the larger total pack being due principally to the greatly increased production in western Alaska and an unusually large run of humpback salmon in southeastern Alaska. The larger production embraced all lines of the salmon industry, which again yielded 87 per cent of the entire output of the fishery. There were commensurate expansions in practically all other fisheries in the Territory.

In 1922 the number of persons employed in the fisheries industry of Alaska was 21,974, the active investment was \$47,509,138, and the total value of products was \$36,170,948. The output of canned salmon was 4,501,652 cases of forty-eight 1-pound cans each, valued at \$29,787,193, an increase of 72 per cent in quantity and 52 per cent in value as compared with the previous year.

A force of 15 statutory employees, 3 special assistants, 20 members of boat crews, and 60 temporary guards was engaged in fisheries conservation in 1922, the largest number that has ever been employed by the bureau for this work. While funds are more limited for the season of 1923, an equally large force has been placed in the field, but the period of employment of most of the men will be considerably shorter. This staff has been augmented by the detail of employees from other branches of the bureau's work for service during the active salmon fishing season. In all, during the season of 1923, there were engaged in connection with the work of the Alaska service 19 statutory employees, 25 men on vessels, and 69 stream guards and other assistants.

The need for revision of the obsolete and inadequate laws under which the Bureau of Fisheries is functioning in an endeavor to protect the fisheries of Alaska is becoming more urgent and obvious each

year. Laws adopted 17 years ago when the industry was comparatively small, and which were designed to facilitate development with relatively little restriction, do not give broad enough control to enable adequate protection to this natural resource now threatened with depletion through overexploitation. The attention of Congress has been called repeatedly to the need of a new fishery code for Alaska, and bills have been introduced in successive sessions, but none has become law. In the emergency which exists and pending the adoption of adequate laws, the situation is being handled through the power given under Executive orders creating reservations in the districts where depletion of the salmon fisheries was most seriously threatened.

In line with the policy inaugurated by the creation by Executive order of February 17, 1922, of the Alaska Peninsula Fisheries Reservation, a further step was taken by an Executive order of November 3, 1922, creating the Southwestern Alaska Fisheries Reservation, including Bristol Bay, Kodiak and Afognak waters, and Cook Inlet. Regulations governing fishery operations in this reservation were issued, and after the end of the fishing season of 1922 a few minor changes were made in the regulations previously issued for the Alaska Peninsula Fisheries Reservation. Permits were granted for operations in 1923 in both of these reservations. Arrangements were also made whereby applications for permits from local residents of the reservations desiring to fish on a small scale were received and passed upon by the bureau's representatives in the respective districts.

A study of the salmon fishery of the Kuskokwim River was made, and a party remained over the winter in the Nushagak region to investigate the salmon spawning grounds and ascertain the size of the escapement in 1922.

Other investigations of the salmon are mentioned in the section of this report dealing with biological inquiries.

A treaty between this Government and Canada, imposing a close season on halibut fishing in waters of the Pacific Ocean, has been ratified by Canada and, with a reservation, by the United States. Legislation by Congress is required to make the treaty effective. By the terms of the treaty fishing for halibut is prohibited during the period from November 16 to February 15 of each year, a distinctly progressive step in the conservation of this great fishery.

During the session of the Alaska Legislature early in 1923 a number of bills and memorials having to do with the fisheries of the Territory were adopted. One act of the legislature provided for the licensing of all fishermen; another amended previous rates of license taxes imposed on the fisheries industry, considerable increases being made in most instances, and especially in the case of the larger operators;

and a third act imposed close seasons on salmon fishing in certain districts.

ALASKA FUR-SEAL SERVICE.

The estimate of the fur-seal herd of the Pribilof Islands as of August 10, 1922, indicated there were 604,962 animals of all ages in the herd, an increase of 23,519 over 1921. The total take of sealskins in the calendar year 1922 was 31,156.

Before the beginning of killing in the current season 5,000 3-year-old male seals were branded on the back with a hot iron, thus permanently marking the annual reserve of male seals required by law and insuring that these animals may be distinguished during succeeding seasons. In addition 5,000 3-year-old males were given a temporary mark by shearing the hair on the head, so as to insure their exemption from killing in the season of 1923; their size thereafter will protect them, as killings will be restricted to the 3-year-old class. In fact, the entire 10,000 animals will be allowed to develop to normal breeding age, subject only to natural mortality, and will thus amply provide for future needs of the herd.

Improved methods of taking and curing have been extended to practically all of the skins taken on St. Paul Island during the season of 1923.

At two sales of sealskins from the Pribilof Islands held at public auction by the Fouke Fur Co. in the fiscal year 1923, a total of 35,312 dressed, dyed, and machined skins, 164 raw, washed, and dressed skins, and 37 raw, salted skins were disposed of, the gross proceeds being \$1,100,279.80. At the sale on October 9, 1922, 17,194 dressed, dyed, and machined skins brought \$535,967.50, and in addition 164 raw, washed, and dried skins and 37 raw, salted skins were sold for \$87.55; at the sale May 28, 1923, 18,118 dressed, dyed, and machined skins brought \$564,224.75.

In addition, 712 blue and 21 white fox skins from the Pribilof fox herds, taken in the winter of 1921-22, were disposed of at the fall sale in 1922. The gross proceeds of the sale were \$67,310. The take of fox skins in the winter of 1922-23 was 888 blue and 29 white pelts. Twelve live foxes for breeding purposes were sold to fox farmers in Alaska in the fall of 1922. The price was \$175 per animal. Reserves of breeding animals were made on both islands.

A visit was made by the Assistant Secretary of Commerce and party to the Pribilof Islands in July, 1922, for the purpose of inspecting the work on the islands and particularly for observing sealing methods. Visits were also made to the Russian and Japanese seal islands, where the herds now number approximately 18,000 and 20,000 animals, respectively. The Japanese herd is doing well, but a comparison of the Russian herd with the rapidly growing Pribilof

herd strikingly shows the value of the protective measures adopted in respect to the latter under the department's supervision.

BIOLOGICAL INQUIRIES AND EXPERIMENTS.

It is the function of the division of scientific inquiry to determine what, if any, depletion of the fish supply had occurred, or whether the conditions of operation of the fisheries are such as to make such depletion likely, and, having determined such facts, to develop corrective measures.

Correlatively there is imposed on the division the duties of discovering and developing new sources of supply of economic aquatic plants and animals and improving the methods of aquiculture. Its problems are, in brief, those fundamental to the utilization of the natural resources of sea, lake, and stream to the utmost extent compatible with a sustained supply. Their solution involves knowledge of the life histories of not only the useful animals themselves but of those other organisms which, as food, enemies, and competitors, importantly affect their welfare. The interrelations of these biological phenomena and the physics and chemistry of the waters are exceedingly complex, but having regard to the primary purposes of the work the bureau during the past year has confined its investigations almost exclusively to the study of the immediate life histories of the economic animals and direct experiments relating to them. In some cases the choice of fields of study has been dictated by the character of the training and experience of the available personnel, other equally or more important investigations being deferred because of the need of peculiar ability and experience not represented in the small scientific staff.

One of the most important series of studies is that concerned with the life history of the several species of salmons of the Pacific coast, some of which, largely by reason of overfishing, are decimated or even in danger of economic extinction in certain streams. During the summer and fall of 1922 special studies were made of the salmon of the Alaska Peninsula Fisheries Reservation to determine the adequacy of the present regulations governing the fisheries. New information concerning the oceanic migrations of the red salmon was obtained by marking about 4,000 of the fish with aluminum tags and noting the localities at which the fish were again caught. The details of this experiment have been published. In addition, several important spawning areas were investigated and material was collected for continuing the studies of the life histories of the fish.

Investigations of the salmon run in Karluk River were continued and the count of red salmon entering the river indicated that the run was much smaller than in 1921 and there were correspondingly fewer fish on the spawning beds. Counts were made of the salmon ascend-

ing Chignik River. As in Karluk River, this work will be continued over a series of years as a basis for determination of the permissible commercial catch.

During the year many adult fish, resulting from planting 100,000 marked young sockeyes in the Columbia River, were recovered. These fish were hatched and reared from eggs brought from the Yes Bay hatchery of the bureau in 1920, and the number of fish recovered indicates that fish culture, as applied to this species, has a material effect on the total supply in the river. These fish differ from the native salmon of the same species in both external appearance and in the quality of the flesh.

An investigation also was made of the location of the present spawning grounds of the blueback salmon of the Columbia River basin, many of the well-known areas formerly used having been made inaccessible by dams erected for power and irrigation developments.

Canning industries utilizing the native clams and crabs have been recently established in Alaska and promise to develop to considerable importance. While no depletion of the supply of these shellfish has manifested itself, the history of similar fisheries elsewhere has shown the danger to be of such consequence that studies have been initiated for the determination of the steps which must be taken to minimize the danger.

The comprehensive study of the whitefishes and their relatives of the Great Lakes has been continued. The biological problems involved in this investigation are difficult and require much time for their solution, but the economic importance of this family of fishes is so great, the fish-cultural operations applied to them so extensive, and the information previously available so meager that a large program for their study is fully justified.

Work on the compilation of the data accumulated by long continued studies on the Atlantic salmon and smelts was resumed during the year on the return to the bureau's service of the assistant formerly engaged on it.

For a number of years the director of the Museum of Comparative Zoology of Harvard University has courteously lent the service of one of his capable assistants for the study of the biological and physical conditions which affect the fisheries of the Gulf of Maine, a very important reservoir of sea food. Many data on certain phases of the research already have been published, and near the end of the fiscal year a voluminous report on what is known of the life history of the fishes of the region was completed.

During the year about 1,500 drift bottles were dropped on three lines running seaward from Cape Elizabeth, Cape Cod, and Sandy

Hook. The recovery of a large number of these was reported and as opportunity occurs others will be released. The purpose is to obtain more specific information concerning the currents controlling the distribution of fish food and eggs and therefore, to a large degree, of the fishes themselves. Similar work, which will supplement the results of the bureau's activities, is being conducted by the Canadian Government, which is also cooperating informally in the tagging of codfish, haddock, and related commercial fishes, employing methods and for purposes similar to those which have been described in connection with the Pacific coast salmons.

As a part of the same comprehensive project for elucidating the significant facts in the life histories of the important food fishes of the North Atlantic coast, and to serve as a basis for determining the past, present, and prospective effects of the methods employed in their capture, other studies have been inaugurated on both sides of the international boundary line, and the data acquired by the respective investigations will be made mutually available.

Progress has been made on the study of the data and material accumulated in the fisheries survey in Chesapeake Bay, which have been assigned to specialists in the respective subjects. This survey repeats in a more limited but nevertheless important field the general plan pursued in the Gulf of Maine investigations.

Near the close of last fiscal year a hydrographic and biological survey of Long Island Sound was undertaken by the steamer *Fish Hawk* for the purpose of determining, if possible, the reason for the failure of the oyster crop in those waters. For a number of years past the formerly important and remunerative oyster industry in Long Island Sound has labored under difficulties that have threatened its very existence, and investigations directed to the oyster itself have not been conclusive as to the causes. The oyster in this region is on the verge of its natural habitat and any slight adverse change in the conditions of its environment may be sufficient to tip the balance against its survival. The investigations conducted for several years past have shown that the microscopic free-swimming larvæ of the oyster are subject to excessive mortality and it is hoped that the precision of the methods used in the survey may throw light on the causes, and, if they be remediable, suggest measures for correcting them. The direct studies of the oyster referred to in previous reports were continued, and near the close of the year experiments were undertaken to develop a method of oyster culture which might remove the delicate oyster fry from the influence of the untoward conditions which prove fatal in the natural environment.

In cooperation with the Bureau of Construction and Repair of the Navy Department the bureau assumed supervision of investigations

of the nature of the fouling of vessels' bottoms and the conditions which control its character and extent. The work is carried on partly at the bureau's laboratories and partly at the navy yards where vessels are docked.

Complaints having arisen that pelicans were unduly destructive to the trout in Yellowstone Lake and were to a considerable extent nullifying the effects of trout culture there, an investigation was made which indicated the allegation to have substantial basis and that some reduction in the number of these predatory birds is advisable.

The fish pathologist has practically determined the cause of high mortality among fingerling trout at many of the bureau's stations and other hatcheries to be a unicellular organism that infests the intestines and the intestinal lining, particularly of young fish. He has also apparently determined the cause of the sterility of black bass and other fishes at certain of the bureau's pond stations. The more difficult work of finding and applying remedies remains to be done.

Experiments and investigations on mosquito control through the agency of fishes have been conducted, as in several previous years, in cooperation with the Bureau of Public Health Service, resulting in material increase in knowledge of the subject, practical application of which has reduced the prevalence of malaria in certain areas.

The laboratory at Fairport, Iowa, has been operated as usual, but those at Woods Hole, Mass., Beaufort, N. C., and Key West, Fla., have been seriously crippled by lack of both personnel and operating funds.

A number of other activities were engaged in which will be referred to in the commissioner's report to the Secretary.

PROPAGATION OF FOOD FISHES.

During the fiscal year special effort has been made to maintain the maximum production of fishes of commercial importance and, as far as economically possible, to apply the curtailment made necessary by the smaller appropriation to those species which are valued primarily for purposes of sport and but secondarily as food.

Nevertheless the limitation of funds and experienced labor has imposed difficulties which it has not been possible to overcome, and it has been necessary not only to refrain from undertaking operations in certain new and promising fields, but to abandon egg collections in some places which in former years have proved highly productive. The inhibitions thus imposed, together with rigorous weather conditions during the spawning season in certain regions, especially the Great Lakes and the Pacific coast, reduced the output of some species materially below that of the preceding year; but, on

the other hand, the marine stations of New England collected, by far, more cod eggs and planted more young cod than in any previous year in the bureau's history.

For some years the policy of the bureau has been to rear more of the fish it hatches, particularly the salmons, to a size at which they are better fitted to care for themselves when liberated, and in response to the effort to this end the output of fingerling fish was more than 20 per cent greater than in the preceding year.

The bureau's supply of eggs of the commercial fishes, with the exception of the Pacific salmons, whose peculiar life history makes it impossible, is derived almost entirely from fish captured for the market and already doomed to destruction. The eggs carried by these fish would die with the parents, and their salvage through the agency of fish culture is therefore a definite addition to the reproductive capacity of the species affected.

The product of the season's work in the salvage of stranded food fishes from overflowed lands in the upper Mississippi River Valley was about 20 per cent smaller than that of the previous year, owing to the comparatively light snowfall in the drainage basin during the preceding winter and the consequent failure of the river to attain flood stage at the spawning period. Under these conditions practically all of the fishes spawned in the smaller pools in close proximity to the main river. In the fall of 1922 the river was at a lower stage than at any time since the bureau's operations in rescue work were instituted, and the salvage crews followed the receding waters and removed the innumerable fishes left stranded in depressions of the river. The number of fish rescued during the year was in excess of 139,000,000.

An important branch of the bureau's activities on the upper Mississippi River is the infection of salvaged food fishes with the glochidia, or larvae, of pearl mussels. The existence of the pearl-button industry of this region, representing a large invested capital and giving employment to thousands of persons, is dependent upon the maintenance of the supply of fresh-water mussels, and the mussel cultural operations of the bureau are an important agency to that end. During the year mussel glochidia to the number of 2,162,047,000 were attached to salvaged fishes before liberating them in the river.

It is believed that in some parts of the United States the output of the Federal hatcheries has about reached the desirable maximum in the production of game and food fishes for interior waters and that the work with these species begun by the General Government should now, in many instances, be taken up and carried on by the individual States for the maintenance of the supply of fish within their respective boundaries. The greater part of the output of such fishes from the Federal hatcheries should henceforth be applied to stocking

waters of the national parks, forests, and other areas under the jurisdiction of the United States. The existence of a vast area within this classification makes it important that the General Government continue the propagation of fishes suitable for those waters.

A policy of stricter scrutiny of applications for basses and other so-called warm-water fishes has been adopted with the purpose of preventing expenditure for the introduction of the species in waters not suited to them or which already are amply supplied with a sufficient stock for maintaining the supply if adequately protected. This policy has increased the effectiveness of the bureau's work and materially reduced the cost of distribution as compared with former years. In some cases it has involved refusal to supply fish for large streams and lakes which already contain in reasonable abundance the species applied for, and an expression of appreciation is due to Senators and Representatives who have given this policy their support.

In such cases the paramount importance of legislation for the conservation of the fish has been urged on the applicants, and a material improvement in the public attitude toward this matter is noticeable. In some cases fishing reserves have been created, and in some States laws have been passed prohibiting fishing for a period of years in waters recently stocked by the bureau.

The economic and sociologic value of well-stocked fishing streams is becoming more generally recognized by State authorities and the public, and there is more general appreciation of the fact that to maintain or improve the existing supply of fish well-considered effort to that end is essential.

The spirit of cooperation between the bureau and the States, which has shown a marked improvement within the past few years, is now becoming a factor of importance. Very material assistance was rendered during the past year by a number of State fisheries authorities in the propagation and distribution of fish. The bureau has been able in numerous instances to participate in the collection of eggs at valuable field stations established and developed as a consequence of such cooperative assistance.

The services of certain men in the bureau's employ have been temporarily loaned to State authorities from time to time, and also to fishing organizations, for the purpose of assisting in the inspection of hatchery sites and to advise regarding methods to be employed in the propagation and distribution of fish. The incentive to increased fish-cultural effort thus afforded by the bureau is resulting in a most favorable reaction on its work by relieving to an appreciable extent the heavy demands upon the Federal hatcheries for fish.

During the year consignments of eggs of various species of fish were furnished to several foreign governments, with the view of

replenishing and renewing the brood stock in depleted waters, and in several cases surplus eggs of certain species were exchanged for spawn of other species not available in this country in quantity.

Some reorganization of the fish-cultural work was made during the year and a number of changes in methods put into effect. Such changes have enabled the bureau to approximate the average output of recent years, and at a lower unit cost, notwithstanding the prevailing increase of about 67 per cent in the cost of labor and materials required to carry on the operations.

The output of fish of all species during the year amounted in round numbers to five billions, the total being about 10 per cent below that of last year. The reasons for the decrease already have been mentioned.

Very truly yours,

HENRY O'MALLEY,
Commissioner of Fisheries.

LIGHTHOUSE SERVICE.

DEPARTMENT OF COMMERCE,
BUREAU OF LIGHTHOUSES,

Washington, July 1, 1923.

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.

Noteworthy progress has been made during the year in the utilization of radio signals for navigation purposes. Three additional radio fog signals have been established in the United States—Cape Henry, Va.; Diamond Shoal Light Vessel, N. C.; and Blunts Reef Light Vessel, Calif., off Cape Mendocino. This makes a total of eight such stations in commission. Five more stations are being equipped, all on light vessels—Boston, Mass.; Nantucket Shoals, Mass.; Five Fathom Bank, Del., off Delaware Bay; Swiftsure Bank, Wash., off the Straits of Fuca; and Columbia River, Ore. Great interest in this subject is being taken by foreign lighthouse authorities as mentioned elsewhere in this report, and installations of various types of radio beacons have been or are being made in France, Norway, Spain, England, Scotland, and Holland. A large number of foreign ships, including many of the large trans-Atlantic vessels and a number of vessels in this country have been, or are now being, equipped with radio compasses or direction finders. These instruments are in extensive use, furnishing in fog, with proper precautions, bearings approaching the accuracy of visual bearings, and available at greater distances.

Automatic apparatus is extensively used in the Lighthouse Service. Steady progress has been made in the substitution of automatic apparatus at old stations and its installation at new stations, resulting in a large annual saving in maintenance, as well as increased efficiency, as stated elsewhere in this report. At the end of the fiscal year out of the 4,047 coast and lake lights, 1,665, or 41 per cent, were

automatic, an increase from 14 per cent in 1911. Automatic fog bells are also being installed where they will sufficiently serve the purpose of navigation. This Lighthouse Service has in commission more automatic apparatus than that of any other country.

Some portions of the personnel of the Lighthouse 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. The results of this act will not take effect until another fiscal year, but the principles and methods it establishes for the adjustment of the difficult problem of fair compensation should be of great value in improving the civil service, though it does not remove some of the special difficulties and inequalities affecting the Lighthouse Service.

The following are the more notable lighthouse construction works during the year: Automatic lighthouses were built on Molasses Reef and Pacific Reef in two important unlighted stretches of the Florida Reefs. A large part of the improved scheme for lighting Raritan Bay, N. J., was accomplished about a month after the funds were available. Preparations were made for the construction of the lighthouse and fog signal at Cape Spencer, Alaska. Many other important items of lighthouse and depot construction, protection, or improvement were completed or in progress during the year, as detailed elsewhere in this report.

Such progress has been made during the year in meeting the needs for replacement of worn-out vessels of the Lighthouse Service that it is possible to reduce the shipbuilding program. This has been accomplished by the construction of light vessels and tenders for which appropriations have been made in recent years, by the reconditioning as tenders of vessels taken over from the War Department, and by the discontinuance of two light-vessel stations. Shortly after the close of the year, on August 24, 1923, new light vessel *No. 106* was placed on Nantucket Shoals Station. One of the light vessels now under construction will be equipped with a Diesel engine. During the year eight high-grade Diesel engines were transferred to the Lighthouse Service from the War Department surplus property, and the use of these will be an important saving in equipping vessels.

The commissioner visited the lighthouse services of several European countries toward the end of the fiscal year and also at the International Navigation Congress in London met the representatives of other lighthouse organizations. There was a free interchange of information, and the results will be valuable both for the technical data obtained and for the mutual interest developed in the international importance of lighthouse practice and engineer-

ing. A further account of foreign lighthouse work is given elsewhere in this report.

At the end of the fiscal year the Lighthouse Service was maintaining a total of 16,888 aids to navigation, a net increase of 513 during the year. Of the total aids 5,942 are lighted and 8,518 are floating. There are 650 aids in Alaska, an increase of 66 during the year.

LEGISLATION NEEDED.

PROVISIONS FOR RETIREMENT FOR DISABILITY AND OTHER CHANGES IN LIGHTHOUSE SERVICE RETIREMENT LAW.

For the persons in the Lighthouse Service covered by the act of June 20, 1918, it is very desirable that the retirement provisions be extended to cover cases, not due to vicious habits or misconduct, where an employee is found to be disabled for useful service before reaching the age fixed in the act. Because of the responsible and arduous character of much of the work, especially on vessels and at light stations, such provisions will add materially to the efficiency of the service and relieve cases of serious hardship now arising. There is provision for retirement of persons incapacitated for duty in the Coast Guard and in the Army and Navy. In the general civil service retirement law of May 22, 1920, there is provision for retirement, after 15 years' service, for disease or injury not due to vicious habits. Persons coming under the lighthouse retirement act of June 20, 1918, are the only ones in the military or civil service of the Government to whom some such provision does not now apply, and legislation is needed to remedy this. Some other modifications in the retirement law are desirable in the interest of efficient organization.

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 stationed at remote or isolated points. Equal benefits should be extended to all light keepers and legislation is needed to provide medical relief for all, 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 change station permanently, 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 failure to report such injuries, etc. Sums received in payment should also be made available for repair of aids.

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 expenses. Furthermore, in many cases Congress has in recent years 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.

ECONOMIES EFFECTED IN THE LIGHTHOUSE SERVICE.

A general statement on this subject was contained in the last annual report. Additional data and economies effected during the last fiscal year are reported as follows:

INSTALLATION OF AUTOMATIC APPARATUS.

During the fiscal year 1923 the lighting apparatus was changed to automatic at 30 stations (of which 22 had resident keepers) at a cost of \$43,214, resulting in a saving in operating cost of \$34,022, or 76 per cent per annum on the cost of the changes. The number of keepers at these stations has been reduced from 50 to 15, a reduction of 35 keepers. Acetylene apparatus was installed at 27 of these stations and electric at 3 stations (1 light vessel station is mentioned separately and not included above).

More complete figures have now been obtained for the results of the change to automatic apparatus from the commencement of this

work, nearly all accomplished since 1910. Including the fiscal year 1923, 559 stations (of which 98 had resident keepers) have been changed to automatic at a total cost of \$513,570, resulting in a saving in operating cost of \$164,127, or 32 per cent per annum on the cost of the changes. The number of keepers at these stations has been reduced from 473 to 167, a reduction of 306 keepers (of whom 121 were resident keepers). Acetylene apparatus was installed at 431 of these stations, electric at 86, oil gas at 41, and city gas at 1.

The change to automatic apparatus also increased the efficiency of the lights and in some instances the changes were made for greater efficiency, without other saving.

Some particular cases of savings by installation of automatic apparatus are these: August 22, 1922, Sabine Bank Light Station, La., was changed to an unattended light, saving \$5,409 per annum, and discontinuing the services of four keepers; March 17, 1923, Bishop and Clerks Light Station, Mass., was changed to an acetylene unattended light, saving \$3,904 annually, and three keepers discontinued.

REPLACEMENT OF LIGHT VESSEL BY BUOY.

A light vessel in the entrance to Chesapeake Bay was replaced on November 3, 1922, by a specially designed gas buoy, having acetylene gas light and fog bell operated by carbon dioxide gas pressure. The cost of the buoy was \$8,921, but the annual net saving in operation is \$15,000 per annum.

DISCONTINUING OF AIDS NO LONGER NEEDED.

An important saving of \$26,269 annually was made February 17, 1923, by discontinuing Pollock Rip light vessel and Monomoy lighthouse, which were rendered unnecessary by the opening of the new Pollock Rip Channel, dredged by the United States Engineers, giving a straight channel through the shoals off Cape Cod.

The system of anchorage buoys in Philadelphia Harbor was discontinued at a saving of \$500 annually.

The Parris Island, S. C., range lights were discontinued at a saving of \$1,250 annually.

Five of the twin lighthouse stations on the coasts of Maine and Massachusetts are each being changed to a single flashing light of increased efficiency, with an ultimate annual saving of about \$8,000; one of these changes was completed during the year.

Plans have been approved for extensive changes in range lights and other aids to navigation in New York Harbor, which will result in a material saving in annual maintenance, with more efficient service to shipping.

VESSELS.

Two of the mine planters transferred from the War Department, and mentioned in the last annual report, have been actually reconditioned and put into service as the lighthouse tenders *Spruce* and *Speedwell*. The total cost of the work was \$96,743. The cost of building two new vessels of equal value is estimated at \$585,301, representing a net saving to the Lighthouse Service of \$488,558.

From War Department surplus eight Diesel engines have been transferred to the Lighthouse Service and will be installed in light vessels as new vessels are constructed or old power units require replacement, with an ultimate saving of \$288,000 over the cost of new engines.

LIGHTHOUSE DEPOT SITE AND BUILDINGS.

The transfer by the War Department of a site and buildings for a lighthouse depot at Norfolk, Va., effects a saving in the cost of establishing the depot authorized by Congress of about \$155,000 and a saving of over \$200,000 to the Government, considering the value of the old site that will be relinquished.

PURCHASE OF ILLUMINATING OIL.

Economies in illuminating oil, through the purchase locally of suitable grades of commercial oil, the installation of tanks at stations, and the delivering of oil in bulk, have been further extended, the districts reporting savings of \$36,257 this year on this account. This is in part, but not entirely, additional to the saving reported last year.

PURCHASE OF SUPPLIES IN LARGE QUANTITIES.

By accumulating district requisitions, so as to make purchases in large quantities, savings have been effected of \$33,245 on glass buoy lanterns and \$19,644 on acetylene cylinders bought during the year, as compared with former costs.

Numerous other economies are reported by the lighthouse districts, as, for example, the purchase of chain, machinery, and other war surplus property, the use of steel pipe for post light dolphins, the conversion of old buoys to improved types, the substitution of electrical power for fog signals, the use on vessels of refrigerating plants instead of purchasing ice, the use of secondhand equipment and materials in construction, construction by force account instead of contract, the use of motor truck to save time of tender, and other transportation economies.

FOREIGN LIGHTHOUSE SERVICES.

During the latter part of the fiscal year a trip of inspection of lighthouse work abroad was made by the commissioner. Lighthouse service headquarters were visited at Stockholm, Sweden; Christiania, Norway; Paris, France; and London, England, and conferences were held with the supervising officers and engineers of these services. In several instances laboratories and supply depots were shown. The principal plants manufacturing lighthouse apparatus were inspected at Stockholm, Paris, London, and Birmingham, and conference also was held with manufacturers of radio navigational apparatus. The lighthouse exhibits at the exposition at Goteborg were examined.

A number of other lighthouse representatives were also met at the International Congress of Navigation, which was held in London in July, 1923, and which the commissioner attended as one of the American delegates designated by the Secretary of State. One of the topics considered by this congress was "Principal advances made recently in lighting, beaconing, and signaling of coasts. Standardization of the languages of maritime signals." In connection with this lighthouse topic there were representatives present or papers presented from 15 different countries or separate lighthouse authorities: Belgium, Denmark, France, Great Britain, Humber Conservancy, Iceland, Ireland, Italy, Japan, Netherlands, Russia, Scotland, Spain, Sweden, and United States. This is probably a larger number of lighthouse interests than have heretofore come together. Fifteen reports on lighthouse subjects were presented to the congress and printed separately, in both English and French. These included a paper by the commissioner on "Recent progress and improvements in aids to navigation in the United States." Because of the wide interest shown and the international aspects of lighthouse work, the desirability was suggested of more full discussion of lighthouse problems, and of giving more opportunity for this at future meetings of the International Navigation Association, which is the only present means for conference and discussion on lighthouse engineering and practice.

D. W. Hood, M. Inst. C. E., engineer in chief to the Corporation of Trinity House, in his general report on the lighthouse papers, gave the following summary and conclusions:

As regards the luminary for optical apparatus, authorities are generally agreed that for buoy and beacon lighting, and in many instances for secondary lights, acetylene gas, either in an open-flame burner or with an incandescent mantle, is the most popular form of illuminant where electricity is unobtainable. That dissolved acetylene gas, however, should be invariably used is open to question, as where a long luminous period is required or where the light

is watched or semiwatched, the study of economy points to the fact that automatic generation of the gas in situ must be fully considered.

For larger optics an incandescent mantle on a petroleum-vapor burner is the most suitable illuminant, unless electricity can be readily obtained at reasonable cost, when the incandescent electric-filament lamp may advantageously be employed.

The need for continued development in the illumination of lighthouses has not in the least diminished, and in no circumstances must it be neglected in the endeavor to develop Hertzian or acoustic fog warnings. The greater its power the more penetrative will be the beam from the lighthouse, and the greatest security is afforded to the mariner by providing a signal which he may see and recognize with his eyes.

Little has been said in the reports about the combination of aerial and maritime lights, and your general reporter is of opinion that such a study is worthy of this conference in order to avoid separate aerial and maritime lighthouses on the coast.

In connection with acoustical fog signals, authorities generally recognize the superiority of the siren or diaphone over other types.

Position finding by wireless is destined to be one of the most important navigational aids of the future, whether employed alone or in conjunction with sound to obtain synchronous signals.

Various countries have different direction-finding systems of their own; nevertheless the problem of the most effective type should be investigated, not by each country individually, but by common international agreement, and it appears to your general reporter that a system applicable to stations both ashore and afloat which employs a wireless beam whose direction is ascertained by the navigator himself is the primary basis for such investigation and development.

In the matter of standardization of seamarks, your general reporter does not propose to make any comment except to state that several authors are of opinion that the ideal has not yet been reached.

Finally, it is considered that the following questions should be submitted to the Congress for discussion:

1. The uses of reinforced concrete in the construction of lighthouse towers.
2. Modern ideas on the proper length of the flashes of lights exhibited from lighthouses.
3. A uniform method of the calculation of lighthouse intensities.
4. The establishment of combined aerial and maritime lights on the coast.
5. Modern lighting equipment for light vessels.
6. The advantages and disadvantages of dissolved acetylene gas and acetylene gas generated in situ.
7. Primary fog signals and compressing plant.
8. Unwatched fog signals ashore and afloat.
9. The establishment of an international commission to investigate and consider the most suitable radio direction-finding system with the consideration of the most suitable wave length.
10. The reconsideration of the international adoption of a uniform system of buoyage and day marking.

Full technical notes on the observations of this trip and the data presented at the congress at London have been prepared for the information of the engineers of this service. The following are the general facts of most importance:

Radio for fog-signal purposes is the subject of first interest, and there is a general appreciation of the possibility of further important developments. Actual installations of radio fog signals have been made or are in progress in France, Spain, Norway, Scotland, England, and Holland, though in no country has this work gone so far as in the United States. The desirability of having the instrument for getting the radio-bearing located on the ship was emphasized by all. The progress made in this direction is considerable, as about 100 foreign vessels are now equipped or being equipped with radio direction finders.

Automatic lighting apparatus is continuing to be extensively introduced, and this is now being extended to more important stations, though in the latter case the stations are not made entirely unattended, but one keeper retained, and the apparatus is expensive. Dissolved acetylene gas is generally used, and there are a number of service installations where higher illuminating power is obtained by a lens revolved by the gas pressure and by the burning of a mixture of acetylene and air under an acetylene mantle with automatic mantle exchanger.

More complicated systems than in this country have been introduced in the distinguishing characteristics of automatic lights and in light sectors.

Incandescent electric lamps are being greatly developed in some countries for automatic lighting at unwatched or semiwatched stations even of primary importance. Large light bulbs, approximating 1 foot in diameter, are in use with spirally wound filaments in gas-filled bulbs. The large current required is supplied from commercial sources or by automatic power units at the station. In some of the apparatus, particularly that for the coast of Holland, where this system is being extensively introduced, the electric light has a reserve gas light which is automatically swung into focus or set in operation in another lens on the failure of the electric light.

Light vessels in some countries are being more generally equipped with propelling power and Diesel engines are being used, but the installation of propelling power is not universal. The use of unattended lightships does not appear to have materially increased. Expensive apparatus for the obtaining of high candlepower and maintaining the lens horizontal is being installed on some lightships.

Fog signals are recognized as of primary importance for the protection of navigation, but aside from the use of radio the principal advance noted was the further introduction of automatic apparatus for minor signals, such as bells. Explosive signals are used to some extent abroad, but the advantage of small installation cost is offset by the continuous manual attention required.

In incandescent oil vapor lamps the use of the autoform, or soft mantle, has been introduced.

The utilization of coast lighthouses for aerial navigation is being considered, but little has been done as to modifications for this purpose, if any are needed.

On the standardization of seamarks, there was difference of opinion as to its practicability. There is, of course, no doubt that a uniform system for the significance of buoy colors and shapes, light colors, etc., would be desirable, but this value must be weighed against the cost and difficulty of changing systems already widely used and understood. A first step in this direction should be a study and comparison of the existing systems of all countries, which does not now appear to be available.

This trip was made under instructions from the Secretary of Commerce, with credentials from the State Department. Very courteous consideration was received from the officers of the various lighthouse services and the others interested in lighthouse work. In 1845 representatives of the United States visited Europe and brought back valuable data on lighthouse work, and the last inspection trip abroad for this purpose was in 1909 by two representatives of the Lighthouse Board. The commissioner also informally visited Trinity House in London in 1911. The results of the present inspection are considered valuable in the technical data gathered, in the direct contact established with organizations and engineers working along the same lines and meeting similar problems, and in the development of international interest in the improvement of lighthouse systems.

AIDS TO NAVIGATION.

During the fiscal year ended June 30, 1923, there was a net increase of 513 in the total number of aids to navigation maintained by the Lighthouse Service. There was a net increase of 128 lights, 25 gas buoys, and 368 unlighted aids, and a decrease of 2 light vessels, and 8 float lights. On June 30, 1923, there were maintained by the Lighthouse Service 16,888 aids to navigation, including 5,942 lights of all classes and 596 fog signals (not including 153 buoys with whistles and 397 buoys with bells), of which 7 are radio signals, 6 are bells operated automatically by gas, and 46 are submarine signals. A large part of the numerical increase is due to additional minor beacons in the seventh district.

During the year 74 new aids were established in Alaska. Nineteen new lights were established, also 50 unlighted buoys and 5 beacons.

The total number of aids to navigation in Alaska on June 30, 1923, was 650, being a net increase of 66 over the preceding year.

Improvements in aids to navigation in the service generally have been made during the year, as follows: Twenty-five fixed lights were

changed to flashing or occulting; the illuminant of 1 light was changed to incandescent oil vapor; the illuminant of 58 lights (including 1 light vessel and 28 lighted buoys) was changed to acetylene; the illuminant of 27 lights (including 1 light vessel) was changed to electric incandescent; 508 aids to navigation of the various classes stated 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 seven important stations, and the fog signals at eight important stations were improved by the installation of more efficient apparatus.

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. 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 buoys, etc.

ADMINISTRATION.

The general organization of the service remained unchanged during the fiscal year.

The appropriations for annual maintenance of the Lighthouse Service for the fiscal year 1924 were \$54,000 less than for the preceding year and \$134,530 less than the estimates submitted. The reduction of appropriations has necessitated the deferring of much important and necessary repair work which has been accumulating on account of higher costs. The appropriations for public works in the act of January 5, 1923, were for the first time made in a lump sum, subject to the approval of the Secretary of Commerce, instead of separately for specific projects. This method of appropriation permits meeting the most urgent needs within the limit of funds available as they may exist at the time work is undertaken.

Shortly after July 1, 1922, the arrangement was carried out with the Navy Department for transferring to the Lighthouse Service the radio stations, with their equipment, that had been established on light vessels, as mentioned in the last report. This arrangement places the operation of these stations and the entire personnel on light vessels under one control, which tends to increase efficiency. The radio equipment on 44 light vessels was transferred, on 25 of which the Lighthouse Service will maintain radio stations, these

being the outside stations, where communication is most important both in safeguarding the lightships and in rendering aid to other vessels.

With the rapid advance in the use of the radiotelephone lighthouse keepers have been encouraged to install radio sets both for entertainment and for their usefulness. Experts at the bureau have devised an efficient but inexpensive radio set which keepers can readily install, and have prepared and distributed circulars of instructions and advice, with drawings, etc. An amateur radio club has been organized, composed of lighthouse employees interested in the subject, for the assistance and encouragement of the personnel in radio work.

Substantial increases in the pay of officers and crews of vessels were granted in May and June, 1923, by the United States Shipping Board, the Inland and Coastwise Waterways Service, the Lake Carriers' Association, and other shipping interests. To retain its crews the Lighthouse Service has necessarily had to make corresponding adjustments, and increases in pay thus far granted to members of crews alone have amounted to about \$130,000. No general adjustment of officers' pay has been practicable as yet, but this is a matter requiring consideration.

The seventh conference of superintendents of lighthouses was held in Washington October 23 to 26, 1922, and was attended by all the superintendents of the coast and lake districts and other officers of the service. Many technical and business problems in the work of the Lighthouse Service were considered, and the work of the conference was conducted largely through committees designated in advance.

A paper on "Recent progress and improvements in aids to navigation in the United States" was prepared for presentation to the International Congress of Navigation at London in July, 1923, and a new edition of *The United States Lighthouse Service* was issued during the year.

The Lighthouse Service participated in the Marine Show at the Grand Central Palace in New York, N. Y., in November, 1922, with an exhibit featuring some of the interesting apparatus used in the service. The exhibit was under the charge of the superintendent of the third district and his assistants and attracted much favorable attention.

Systematic inspections of the service, both on its technical and its business sides, were continued during the year. The superintendent on general duty and the examiner visited most of the lighthouse districts, and special inspections were made by the commissioner and other officers from Washington.

Various economies effected in the maintenance of the service have been mentioned under that head.

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.

ENGINEERING CONSTRUCTION.

The more important items of construction completed during the fiscal year were the Nantucket Harbor Fog Signal Station, Mass.; purchase of additional gas buoys and equipment for improvement of aids to navigation in the fifth district; the establishment of Pacific Reef Light and Molasses Reef Light, aids to navigation, Florida Reefs, Fla.; construction of a dwelling at Dry Tortugas Light Station, Fla.; improvements to the ranges and construction of dwelling, Guantanamo, Cuba; improvements to aids to navigation, Huron Harbor, Ohio; the transfer from the Shipping Board of a double dwelling and its site for the use of the keepers at Lorain, Ohio; improvements to aids to navigation, St. Marys River, Mich.; construction of a keeper's dwelling at Yaquina Head, Oreg.; improvements to Coquille River Light Station, Oreg.; and the establishment of new aids and improvements to existing aids to navigation, Washington and Oregon.

Other important works in active progress at the close of the fiscal year included the following: Transfer of keeper's dwelling at Ned Point to Wings Neck Light Station, Mass.; 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; constructing wharf and boathouses for the combined use of the third, fourth, and fifth lighthouse districts at Lewes, Del.; 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; preparations for a new depot at Fort Norfolk, Va., to replace the one now at Portsmouth, Va.; establishing and improving aids in St. Johns River, Fla.; repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts; 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 a light and fog signal at Sabine Pass Jetty Light Station, Tex.; placing riprap protection at Sand Island Light Station, Ala.; providing a right of way at Point Borinquen Light Station, P. R.; constructing a new wharf at lighthouse depot, San Juan, P. R.; improving aids to navigation at Conneaut

Harbor, Ohio, and Erie Harbor, Pa.; preparation for completing work in Detroit River; placing protective belt about Spectacle Reef Light Station Pier, Mich.; preparations to place a protective belt about Stannard Rock Light Station Pier, Mich.; improvements at Detroit lighthouse depot; improvements at Chicago Harbor, Ill.; improving aids at Indiana Harbor Ind.; improving aids at Calumet Harbor, Ill.; purchasing a site for a new keeper's dwelling at Manitowoc, Wis.; establishing and improving aids at Ludington, Mich.; establishing new aids and rebuilding Guard Islands and Point Retreat Light Stations, Alaska; preparation for establishing a light and fog signal at Cape Spencer, Alaska.

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 is in progress, with the cooperation of the Bureau of Standards, with a view to lessening or eliminating the effect of interference. To this end a tube transmitter operating with continuous wave will be installed at one of the new stations.

The radio telephones established at Cape Sarichef and Scotch Cap Light Stations, Alaska, are now operating successfully, and have proven very valuable in the maintenance of these stations, facilitating landings, etc. Radio telephones are also being established at two stations in the eleventh district and one station in the eighteenth district.

Automatic lighting apparatus is being extensively introduced, using both acetylene gas and incandescent electric lamps, with a considerable resulting saving, as detailed under "Economies." A trial is being made of the use of compressed acetylene in post lanterns in the fifth district which promises good results.

Investigations and experiments were continued during the year toward the adoption and use of primary electric batteries and small incandescent lamps for minor lighted aids, with so much success that 12 sets of this illuminating apparatus were constructed and distributed for actual trial in service at certain points throughout the United States. An aid of this type was established at Blackstone Island, Md., in December, 1922, and has operated satisfactorily.

The incandescent oil vapor lamp at Cape Henry Light Station, Va., was replaced by an electric incandescent lamp showing a flashing light, increasing the candlepower from 22,000 to 80,000. This increase was effected by the use of a specially designed spherical mirror in combination with the electric lamp, which was adjusted in the old lens so that it approximately inclosed the foci of the different zones. Commercial current is used but there are emergency generating plants in case of interrupted service.

A hygroscopic controlling device for fog signals in use experimentally at Lazaretto Lighthouse Depot has not failed to operate during fog or weather of low visibility during the year. The first service application of this apparatus is being made at Lambert Point Fog Signal Station, Va., in connection with a 1,000-pound bell and electric fog-bell striker.

A large buoy was equipped with a fog bell automatically operated by a gas-pressure striker and established in Chesapeake Bay at the entrance to Craighill Channel, making it possible to convert Baltimore Light, a large attended caisson light and fog-signal station, to an unwatched light without fog signal. Other installations of this automatic fog bell have been made.

Remote-control fog-signal plants at the end of long jetties, on breakwaters, and at isolated places on shore, contiguous to light stations in commission and from which weather conditions at the point to be protected can be observed, are being established as funds will permit.

Improvements have been made to the gong buoy mentioned in the last annual report. It has received favorable comment.

The special can and nun buoys mentioned in previous reports have proven more satisfactory than the spar buoys they are to replace in that they do not lie down in shallow water at low tide, become sodden with water or submerge, and are not liable to damage by ice. They are neater and more distinctive in appearance than spar buoys.

A special type of dolphins, made of steel piping instead of wood, has been developed. They are not carried away annually by the ice, as are the wooden dolphins, which require rebuilding each spring, do not require an unwieldy pile driver to put them down, and are easily and quickly put in place by a gasoline-engine-driven jet pump. Material for three beacons and the jetting outfit can be carried on a 30-foot power boat, whose crew can put them in place and paint them in three hours.

The thermit process of welding was successfully used in repairing a broken casting of one of the bearing piles of York Spit Light Station, Va., which had been damaged by collision. This was accomplished successfully by the Lighthouse Service force without the employment of specialists.

The use of small valveless scaling tools using compressed air, in place of the larger standard tool, has continued to give satisfaction with economy.

Special attention is still being given to the installation of storage tanks for kerosene at depots and light stations and the purchase of kerosene locally in bulk, though most of this work has now been accomplished.

On June 30, 1923, 315 light stations had telephone connections, this being an increase of 14 during the year.

PERSONNEL.

On June 30, 1923, there were 6,020 persons employed in the Lighthouse Service, including 92 technical, 153 clerical, and 5,775 employees connected with light stations, vessels, and depots. This is a net increase of 36 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.

Of the positions in the service, 56 are statutory and 5,964 are paid from lump-sum appropriations. Of the latter, however, the average base pay of the lightkeepers (1,416) is fixed by law at \$840.

The annual report of the United States Employees' Compensation Commission for the fiscal year ended June 30, 1922, gives the number of reported cases of injury subject to compensation for the calendar year 1921 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, 82. This number as compared with that for 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, when it becomes effective, will be of great value in increasing the efficiency of the Lighthouse 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.

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.

Provision is needed for improved depot facilities in several of the districts, in addition to the above, 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.; Ketchikan, Alaska; and Goat Island, Calif.

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 improvement to the wharves at Goat Island depot, Calif.

VESSELS OF THE LIGHTHOUSE SERVICE.

REPLACEMENT OF VESSELS.

Important progress in providing for the replacement of old and worn-out vessels has been made during the year. The five light vessels, *Nos. 106 to 110*, being constructed under the appropriation of March 4, 1921, are nearing completion, and it is expected that they will all be placed on station during the coming year, with a rearrangement of light vessels which will permit of condemning the following vessels which are considered as no longer safe, and not worth the expense of repair: *No. 20*, Cross Rip, Mass.; *No. 11*, Scotland, N. J.; *No. 34*, Charleston, S. C.; *No. 3*, Handkerchief, Mass.; *No. 4*, Relief, second district. The company responsible for the sinking of light vessel *No. 51* on April 24, 1919, has arranged for the building of the hull of a light vessel to replace it; this vessel *No. 111*, is under construction and will be equipped with a Diesel engine now available, and will permit the condemnation of *No. 48*, Cornfield

Point. This provides for light vessels urgently requiring replacement within the next three years, with the exception of *No. 70*, San Francisco, Calif., which is included in the estimates; *No. 23*, Ram Island, Conn., which will shortly be replaced by a gas buoy; and *No. 56*, North Manitou Shoal, Lake Michigan, for which a substitute would be available under the estimate for building a lighthouse on Martins Reef, Lake Huron. Urgent requests have been received for light vessels to be placed off Barnegat, N. J., Grays Harbor, Wash., and St. Johns River, Fla. The first of these was included in the estimates on which Congress acted in authorizing the construction of light vessels in the act of June 5, 1920, and in appropriating for light vessels in the act of March 4, 1921; it is expected that provision can be made for placing one of the older vessels at this station in the rearrangement of vessels above mentioned.

Two of the mine planters transferred from the War Department are being reconditioned, and these tenders, the *Lotus* and *Ilex*, with some rearrangement of vessels, will be used to replace the following tenders worn out in service and not worth further repair: *Lilac*, ninth district; and *Holly* and *Arbutus*, fifth district. The river tenders *Goldenrod* and *Oleander* can be kept in service only a short time longer; these will be replaced by the *Greenbrier*, now being built under the appropriation of June 12, 1917, and the *Willow*, for which plans are prepared, to be built under the appropriation of January 5, 1923.

Four small concrete vessels were transferred to the Lighthouse Service from War Department surplus in October and November, 1922. Each of these vessels is equipped with two 450-horsepower Diesel engines of superior make. These engines with their auxiliary machinery will be of great value in equipping new light vessels and replacing deteriorated power units, and possibly also for lighthouse tenders of suitable size; the value of the engines is estimated at \$288,000. The hulls will be disposed of for other use.

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 provided for by vessels now building, six light vessels and four tenders should be replaced 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 two new vessels and the reconditioning of several others.

LIGHTHOUSE TENDERS.

The lighthouse tenders during the year have steamed a total of 483,881 nautical miles, or an average of approximately 7,700 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.

The reconditioning of two large mine planters transferred from the War Department to this service has been completed and these tenders were placed in commission as follows: The *Spruce* (formerly the *Col. Garland N. Whistler*) in the third district in December, 1922, and the *Speedwell* (formerly the *John V. White*) in the fifth district in April, 1923. The reconditioning of two more is now under way at the third district depot; the *Lotus* (formerly the *Col. Albert Todd*) and the *Ilex* (formerly the *Gen. Edward Kirby*).

No other new tenders were added, but the old tender *Myrtle*, which had been laid up during the year as being unseviceable, was sold for a nominal amount.

The tender *Greenbrier* is under construction for the Ohio River.

The act of January 5, 1923, appropriated \$240,000 for constructing, purchasing, or equipping lighthouse tenders and light vessels. It is proposed to use the greater portion of this amount for the construction of the side-wheel steam-driven tender *Willow*, for use in the fifteenth district on the lower Mississippi River to replace the tender *Oleander* which is now in very poor condition.

Owing to especially severe ice conditions in New England last winter, the tenders of the first district were called on for unusually difficult work, being continuously employed breaking ice, releasing shipping, and transporting mails and passengers, when not engaged in regular duties, and the tenders of the second district had very heavy duty in maintaining the important aids to navigation.

At the end of the year 30 tenders were equipped for radio communication, and 4 tenders were provided with radio compasses; 56 tenders in all were in commission.

LIGHT VESSELS.

The Lighthouse Service maintains light vessels on 47 stations. During the fiscal year 61 vessels were in commission, of which 14 are relief vessels, and they averaged 257 days on station for each vessel. Many of these light vessels have passed the age of useful service, and some of them are in such condition as not to warrant repairs from an economical point of view.

New light vessel *No. 106*, the first of the five light vessels constructed under the appropriation of \$1,000,000 made by the act of March 4, 1921, was completed during the fiscal year, equipped for station on Nantucket Shoals, Mass., and was placed on station on August 24, 1923. The four other vessels appropriated for under

this act were all under construction at the end of the fiscal year and ranged from 81 to 98 per cent completed.

New light vessel *No. 111*, now being constructed by the Standard Oil Co. for the Government, replacing a light vessel sunk by a barge belonging to that company was, at the end of the fiscal year, 15 per cent completed.

Two light vessel stations were discontinued during the year, Tail of the Horseshoe (replaced by a buoy), November 3, 1922, and Pollock Rip (no longer needed), February 17, 1923. Martins Industry light vessel was moved about 14 miles to station off Savannah River, and renamed *Savannah*.

At the end of the fiscal year radio apparatus was maintained on 20 light vessel stations and on 6 relief vessels, the apparatus on 20 vessels having been removed as of no further practicable use. There are 5 light vessel stations equipped with radio fog signals.

The following was the total number of light vessels and stations on June 30, of the years named:

Year.	Light vessels.	Light vessel stations.	Year.	Light vessels.	Light vessel stations.
1910.....	68	54	1919.....	65	50
1915.....	66	53	1920.....	62	49
1916.....	66	53	1921.....	64	49
1917.....	68	53	1922.....	61	49
1918.....	67	52	1923.....	61	47

Of the present light vessels 38 have self-propelling machinery and 22 are provided with sail power only. One has no means of propulsion.

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 115 instances of saving life and property or rendering valuable aid were reported, often at a great risk to the lighthouse employees. Many of these acts were especially meritorious, and the employees were individually commended by the Secretary of Commerce.

Very truly yours,

GEORGE R. PUTNAM,
Commissioner of Lighthouses.

COAST AND GEODETIC SURVEY.

DEPARTMENT OF COMMERCE,
COAST AND GEODETIC SURVEY,
Washington, July 1, 1923.

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 fiscal year, with some of its most urgent needs:

The organic act establishing this bureau was approved February 10, 1807. In it the President was authorized and requested to cause a survey to be taken of the coast of the United States for completing an accurate chart of every part thereof. The provisions of this act have been modified and added to from time to time until at present, broadly speaking, the functions of this bureau are to make surveys of the coasts of the United States, Alaska, and our island possessions in order to produce data for accurate charts which will show the coast lines and such topography as is necessary for the needs of the navigator, the depths of the water along these various coasts, with such accompanying coast pilots, sailing directions, and tide tables as are necessary to enable the mariner safely to travel these waters.

It is also the duty of this bureau to establish magnetic meridian lines, to make gravity observations, and to furnish for surveyors, engineers, and others fundamental elevations and geographic positions in the interior of the United States and its possessions.

I am submitting below a condensed report, subdivided by classes of work as outlined above, on the accomplishments of this bureau during the past fiscal year.

HYDROGRAPHIC SURVEYS.

NEW EQUIPMENT AND APPARATUS.

The steamers *Discoverer* and *Pioneer* mentioned in my report of last year, as having been transferred to this bureau from the Navy Department (the arrangements of the transfer being made by the Bureau of the Budget), have been engaged in survey work during the entire year. These vessels have proven economical and efficient surveying units and better adapted for surveying purposes, even

more so than was anticipated. The other vessel, the *Guide* (transferred in the same manner), has been altered to fit it for surveying duty and is now at the Brooklyn Navy Yard where a sonic depth finder is being installed, as well as a subaqueous sound-ranging apparatus for the determination of the ship's position while sounding.

The problem of making hydrographic surveys along the Pacific coast is difficult, as in the winter time when clear weather exists, gales are severe and frequent and a very small percentage of time can be utilized for survey work. During the summer, fogs are prevalent and the work is greatly delayed and the unit cost increased thereby. Experiments in the past have been carried on for the determination of a ship's position from radio compass stations, but these positions, while adequate for navigation, did not meet the requirements in accuracy necessary in hydrographic surveying. An officer of this service, who had experience in the Navy during the war in the experiments carried on for the detection of submarines, suggested the possibility of the determination of the ship's position by subaqueous sound ranging. This officer made an intensive study of the problem and, with the cooperation of the Bureau of Standards and the Army authorities at Fort Wright, devised an apparatus which is being constructed by the Bureau of Standards. It is believed this equipment will serve the purpose of accurately determining a ship's position while engaged in sounding during foggy weather. This equipment is nearly completed and will be installed on the steamer *Guide*. Experimental work will be done on this coast prior to the sailing of the *Guide* for the west coast. With the installation of the sonic depth finder developed by the Navy, the function of which is the determination of depths by the reflection of the sound waves from the bottom, and the installation of the instruments for determining the ship's position by subaqueous sound ranging, the *Guide* will be the most modern survey vessel afloat.

GENERAL OUTLINE OF HYDROGRAPHIC SURVEYS ACCOMPLISHED.

Along the Atlantic coast hydrographic surveys were made at the entrances to Chesapeake Bay, the Cape Fear River, off the coast of Florida in the vicinity of St. Augustine, and on the Gulf coast, in the vicinity of the Mississippi River Delta and the Chandeleur Islands, and Sabine Pass, Tex.

The completion of the much-needed drag work along the New England coast, the necessity for which was mentioned in my report of last year, was commenced during the latter part of the fiscal year.

On the Pacific coast, surveys were made of San Diego Harbor, and off the coast of southern California, including a detailed survey of Cortez Bank, which is approximately 40 miles offshore. Offshore

surveys were also made in the vicinity of Coos Bay and a detailed survey of Suisun Bay was also accomplished.

A survey of Lake Tahoe, a lake on the eastern slope of Sierra Nevada Mountains, was made during the summer of 1922. This lake is about 21 miles long and 12 miles wide; its elevation is over 6,200 feet above sea level, the water is quite deep, about two-thirds of the water area being deeper than 1,200 feet. The greatest depth obtained was 1,640 feet.

In southeastern Alaska, surveys were made of portions of Clarence Strait, Ernest Sound, and Zimovia Strait; wire-drag survey of Lynn Canal, Cross Sound, and Icy Straits; detailed survey of Icy Bay; and offshore hydrography in the vicinity of Cape Ommaney. In southwestern Alaska, surveys of Shelikof Strait in the vicinity of Portage Bay and work in the vicinity of Cape Pankof were accomplished. A detailed survey of Kachemak Bay was in progress at the end of the year.

In 1914 a wire-drag survey of the main inside steamship routes of southeastern Alaska was commenced. This exceedingly important work will be completed during this summer. At the end of the fiscal year the deep-water channels have been dragged as far west as Cape Spencer. This marks the completion of one of the most important surveying projects of Alaska, as practically all vessels entering and leaving the Territory pass through these waters. In the past, the stranding of many vessels, resulting in the loss of lives and much property, in these much-traveled waters emphasizes the importance of this work. It is reasonably certain that all pinnacle rocks along these routes have been found and accurately located.

In the possessions of the United States, a wire-drag survey of Vieques Sound, P. R. (requested by the Secretary of the Navy), was nearly completed, only two weeks' work remaining to finish this project. In the Philippine Islands, surveys were made in the Sulu Archipelago, off the west coast of Palawan Island, and in the vicinity of Sarangani Bay.

An important accomplishment was the deep-sea sounding done by the two new vessels, the *Discoverer* and *Pioneer*, on their way from the east coast to the west coast. These soundings are of value to science and add greatly to the completeness of the navigational charts. They were accomplished at practically no additional cost over and above that of transferring the vessels to the Pacific coast. The *Lydonia*, on the trip from the west coast to duty on the east coast, also made similar deep-sea soundings. The work of these three vessels has added materially to the knowledge of the depths of waters on the usual track of vessels proceeding from coast to coast of the United States via the Panama Canal.

ADDITIONAL VESSELS.

The addition of the three vessels mentioned gives the bureau an adequate equipment for offshore hydrography. A vessel of about 500 tons is needed to replace an old vessel now being operated on the east coast and unsuitable, on account of age, for survey work. A small vessel of approximately 5-foot draft is urgently needed for the surveys of the inland waterways along the Atlantic coast. The importance of these waterways is increasing greatly and the bureau lacks the proper equipment to make the much-needed surveys of them. In Alaska three small vessels, approximately 70 feet in length, are needed to work in conjunction with the larger survey vessels, the former to do the work close inshore, which is extremely dangerous and expensive to execute with the larger and more expensive vessels.

GEODETIC ACTIVITIES IN 1923.

The field work on geodetic operations followed, as usual, three general lines, namely, triangulation to determine geographic positions, leveling for elevations, and astronomical and gravity observations to be used in adjusting triangulation and in supplemental investigations.

The precise triangulation completed, principally in New Mexico, Colorado, Idaho, Montana, California, Washington, and Alaska, had a total length through the schemes of 720 miles and covered an area of 23,840 square miles. An additional 300 miles of preliminary and secondary triangulation was completed, with an area of 1,740 square miles. Seven precise base lines were measured, with a total length of 74.5 miles, each having a probable error of less than 1 part in 1,000,000.

Lines of precise leveling, totaling over 1,400 miles, were run in 15 different States and in Alaska, and elevations were determined for over 1,000 permanent bench marks.

Each of the parties engaged on precise triangulation determined the astronomic azimuth of a number of lines in its scheme, and in addition an astronomic party was in the field during the greater part of the year observing longitude and latitude and determining the intensity of gravity at a number of points in the United States and Alaska. A gravity party was engaged for four months on special investigations in Kansas, Oklahoma, and Texas to determine the extent to which gravity observations could be used to indicate the subsurface structures of the earth in the vicinity of salt domes and oil wells.

In Washington the office force of the division of geodesy was engaged in computing the final results of the field observations, preparing the resulting data for publication, answering the numerous requests for information, and carrying on special investigations.

Answering the requests for information consumed 18 per cent more time than during the fiscal year 1922 and 60 per cent more than during the fiscal year 1921. This increased demand for geodetic data makes it imperative that the results of the field work be published as rapidly as possible, and 40 per cent more time was spent in the preparation of data for the printer than during 1922. A number of important publications were issued during the year and others are nearing completion.

GEODETIC SURVEYS NEEDED.

The great need for extending the precise triangulation and leveling in the United States in order to complete the necessary control systems is indicated by the presence of large areas within which there is either no precise triangulation or no precise leveling. The sizes of these areas are startling when one considers the recommendation of the Board of Surveys and Maps that precise horizontal and vertical control be extended as rapidly as possible to an extent that no point should be more than 50 miles from a horizontal and vertical control station.

The areas in continental United States entirely lacking in precise triangulation total more than 1,250,000 square miles, and the areas without any precise leveling total more than 950,000 square miles.

This discloses rather poor progress in the making of control surveys of the United States at the present time. It is true that much precise triangulation and precise leveling have been done in the United States, but it must also be remembered that we have 3,000,000 square miles, the covering of which is a large undertaking, and in order to accomplish it appropriations of funds must be in proportion. It has been said that we should not expect this country to be advanced as far in its control surveys as a small area like Japan, France, and other countries. This argument does not seem sound, for certainly a square mile of our area is just as important to us as a square mile of any of the other countries is to its inhabitants. The area of the United States is more than eleven times that of the Japanese Empire and it is about fourteen times that of France. Certainly our country can afford the control surveys, which to complete would require about \$4,000,000. A single enterprise, such as a power or irrigation project, would cost as much, and those projects can not be properly planned and executed without an accurate knowledge of the country such as is given by accurate maps based on precise control.

When it is realized that the completion of the precise control systems of the country could be completed within the next 10 or 15 years at a very moderate cost per year, to the great benefit of the

States, counties, and cities of the country, we are forced to the conclusion that it would be wise administration to have this work expedited. Many millions of dollars are spent annually on highways alone, and yet it has been stated that if the country were completely surveyed topographically and these surveys were based on precise fundamental control systems the saving in a few years in the construction and maintenance of the highway system would pay for completing the topographic map.

There is a branch of surveying, coming into use to a greater extent each year, which has much commercial and industrial importance. This is the surveying from airplanes in conjunction with city planning, water-power development, drainage investigations, extension of highways and railroads, and high tension lines, and for many other purposes.

The office of the Coast and Geodetic Survey is frequently called upon by commercial firms making such surveys and maps from airplanes for control data. In some instances the data in question can be furnished, but in many others nothing is available. Where control data are available it is a very simple matter to make the photographs and place them in their proper geographic positions, thus making a map resulting from aerial photography fit into the general map system of the country. Without control surveys these airplane surveys and maps are not properly coordinated with surveys and maps of the surrounding country.

In the interest of the cities and industrial and commercial enterprises, which are benefited by the surveys and maps made from the air, the control surveys should be carried on at a more rapid rate than has been the case in the past.

The Coast and Geodetic Survey was called on to cooperate with the commissioners named by the Supreme Court of the United States for the Texas-Oklahoma boundary in order that the surveys, made to show the exact location of the boundary, might be made according to the most approved methods. Engineers of the Coast and Geodetic Survey were assigned to the work of carrying precise triangulation along the boundary, the field expenses of which were paid by the funds available to the commissioners. This work was started in the late spring of 1923 and will be completed early in the fiscal year 1924.

This is the first instance of a State boundary having precise control for the detailed surveying operations, but it is believed that the results accomplished by the commissioners in having such control surveys will lead to the employment of precise control in connection with other State boundary surveys which may be made in the future.

There is urgently needed an appropriation with which to pay the salaries of temporary mathematicians and computers to make a computation and adjustment of the triangulation which has been extended along the Mississippi and other rivers by the Mississippi River Commission, the Missouri River Commission, and the Corps of Engineers of the Army. The triangulation in question was executed some years ago in connection with river improvement and control, and while this triangulation has met the requirements for those purposes, it can be made of great value in other engineering work, including surveying and mapping. But, in order that it may be available, the longitudes and latitudes of the triangulation stations, and the azimuths and distances between each two contiguous stations, must be placed on the North American or standard datum. The triangulation data along these rivers would then be in harmony with the general control system of the country, and maps based on the river work would properly fit into the general map system of the country without those gaps, overlaps, and offsets which are inevitable where all of the triangulation of a large area is not coordinated into a single system. Appeals from other Government organizations making surveys and maps indicate clearly that the results of the triangulation of the rivers mentioned above are needed by them in carrying on their operations. The cost of making the computations and adjustments and printing the results of the river triangulation would be very small as compared with the benefits derived. As Congress has charged the Coast and Geodetic Survey with the duty of extending fundamental control systems over the country, it is logical that the Coast and Geodetic Survey should be directed to make the computation and adjustment of the river triangulation in question, rather than that it should be done by some other organization or organizations which are not charged with extending control surveys over the country for general use.

There is immediate and urgent need for a substantial increase in the office force of the division of geodesy of the Coast and Geodetic Survey, in order that the results of control surveys may be made available to the public in published form shortly after the field observations have been made. There has been a decided increase in the money made available for geodetic work in the interior of the country and along the coasts during the past decade, but there has been no corresponding increase in the number of mathematicians and computers who are engaged on the computation, adjustment, and publication of results. The cost of the computation and publication of triangulation and leveling data is very small as compared with the cost of the field work, and it is good business to make the results

available to the public as soon as possible after the completion of the field work.

MAGNETIC WORK.

The magnetic observations 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 necessary absolute observations and scale-value determinations have also been made. These records have been used to reduce the field results to standard values and they also furnish material needed for the study of the yet unsolved problems of terrestrial magnetism.

In the field especial attention has been given to the inspection and replacement of defective magnetic stations for the use of local surveyors in standardizing their magnetic surveying instruments. The magnetic survey of Florida was completed, and similar work was started in Georgia and Tennessee, and will be extended into North and South Carolina during the next fiscal year. Replacement work was also done in Mississippi, Arizona, and California. Special observations were made in cooperation with the Bureau of Mines to determine the practicability of locating so-called nonmagnetic iron ore by precise magnetic methods. It was found that the needle is affected by such masses of ore, but not in such a degree as to provide a reliable method of location. The occupation of repeat stations was carried on in the Pacific Coast States, southern tier of States from Washington to Louisiana, and also in the north tier of States from the Dakotas to Michigan. New stations were established in South Dakota.

Studies in terrestrial magnetism made during the last few years indicate the need for continued observations by existing organizations. This applies to both field and observatory results. The possibility of discontinuing one observatory in order to reduce the expense of operation was carefully considered. It was found that field work could not be properly standardized if any of the existing observatories ceased to function. It was the opinion of this bureau that the work of all the observatories is absolutely essential to the solution of the extremely difficult problems of the earth's magnetism. Various scientists were consulted, and in every case the opinion was that there should be more, rather than fewer, magnetic observatories, operated with the same standard as that maintained by the Coast and Geodetic Survey.

A canvass of county surveyors has been carried to such a point that the bureau is now in correspondence with more than 1,000 county and other surveyors, and has received reports on the state of preservation of 21 per cent of its approximately 3,700 magnetic sta-

tions. This represents a distinct advance in insuring the furnishing of up-to-date information to the public. The need for the magnetic results of this bureau on the part of great numbers of local surveyors has been clearly brought out and the effort to bring this matter to their attention has been much appreciated by such local surveyors.

MAGNETIC SURVEYS IN ALASKA.

During the past fiscal year the magnetic declination was determined at a large number of triangulation stations in southeastern Alaska and areas of local disturbances were investigated. In Lynn Canal and in Ernest Sound, Clarence Strait, an investigation of the areas of local disturbance was made. The latter area has not been mentioned in any existing publications.

Complete magnetic observations are needed along the western shores of Alaska and in the interior. With the increasing development of the interior, magnetic survey methods have in many cases proved advantageous, until more accurate methods can be used, provided the declination is accurately determined. At present, magnetic stations are found only along the main line of travel, and there are vast areas where no observations have been made. Observations are needed in the Aleutian Islands to meet the needs of commerce from the Pacific coast to the Orient, which passes just south of these islands.

The Coast and Geodetic Survey has maintained an observatory at Sitka since 1902. Continuous observations have been made of the magnetic declination, dip, and intensity without break since that time. The disturbances known as magnetic storms which affect the direction and intensity of the magnetic elements occur with great frequency in Alaska. These storms are apparently related to unusual difficulties in submarine-cable transmission and also to operation of radio stations.

SEISMOLOGY.

Since the landing of the early settlers five major earthquakes have occurred within the United States and the adjacent area of Canada, and many minor earthquakes. Major earthquakes have occurred in Alaska and Porto Rico since these regions have come under the jurisdiction of the United States. The occurrence of earthquakes is of vital importance to a portion of the Pacific coast region. Many earthquakes have occurred in regions where they were not expected and where it was the general belief that no earthquakes would occur. The importance of earthquake study is evidenced by a special investigation now being made in California by cooperation with the Carnegie Institution, State universities, and this and other Government

bureaus. It is expected that the investigation will make it possible to predict earthquake occurrence in a general way, and especially to designate areas where special precautions in construction should be used and where buildings of large proportions and great dams should be avoided.

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 the most skilled observers in order that the earthquake records may be correctly interpreted. This bureau has operated seismographs at five widely separated stations for 18 years, but as the work has been supplemental to magnetic work the stations have not been of high class.

It is proposed to equip the magnetic observatories at Tucson, Ariz., and Sitka, Alaska, with new instruments of high grade, thus making them first-class seismological stations. These are selected as being in relatively quiet regions near to regions of great activity in the present or near past.

TIDAL OBSERVATIONS.

For general hydrographic control for navigation, and for the determination of sea-level changes, automatic tide gauges were kept in operation throughout the year at six stations on the Atlantic coast, three stations on the Gulf coast, four stations on the Pacific coast, one station in Alaska, and one station in the Hawaiian Islands. In connection with hydrographic surveys short series of tidal observations were made at various points along the coast. A comprehensive tidal and current survey of New York Harbor was carried out jointly with the United States Army Engineers' Office, first district, New York. In cooperation with the Bureau of Lighthouses current observations were made on six light vessels stationed along the Atlantic coast and one light vessel on the Pacific coast. The new field automatic tide gauge has been fully tested out and is to be used in the field work of the Coast and Geodetic Survey during the coming fiscal year.

TIDAL AND CURRENT SURVEYS OF IMPORTANT HARBORS.

Comprehensive tidal and current surveys of our larger harbors are needs of outstanding importance. The increased size and draft of the vessels of modern commerce make necessary the expenditure of considerable sums in the improvement of our harbors, and this in turn means that the engineer engaged in harbor improvements must have at hand the data concerning the characteristics of the tides and currents in the various harbors. It is important to note that because of the highly specialized nature of tidal and current work the Coast

and Geodetic Survey is the only agency in the Government which is looked to for tidal and current information.

To the navigator a knowledge of the times of slack water and other characteristics of the current in a harbor is of importance in the berthing of large vessels. To meet this need the Coast and Geodetic Survey has begun the issuing of current tables for the Atlantic and Pacific coasts of the United States. These tables give in advance the times of slack water for every day of the year at a number of our most important harbors and differences for several hundred secondary ports. The information in the current tables is based on such data as were at hand; but for really accurate current tables comprehensive current surveys must be made to furnish the necessary data for the predictions.

The concentration of population in our cities bordering the tidal streams of our important harbors makes the disposal of sewage an important matter. In the plans made for sewage disposal a knowledge of the tides and currents in the harbor in question is essential. In this connection the Coast and Geodetic Survey is asked to furnish the tidal and current data which will permit of the calculation of flood and ebb volumes and the characteristics of the currents in various harbors.

NEW YORK HARBOR.

Congress, realizing the importance of this work, made a beginning for the fiscal year 1923 by a modest increase in the appropriation for tides and currents for the purpose of carrying out a comprehensive tidal and current survey of New York Harbor. The field work was carried out during the early part of the fiscal year 1923 in cooperation with the United States Engineer Office, first district, New York, and the computations are now being made in the division of tides and currents of the Coast and Geodetic Survey.

The results of this tidal and current survey are to be embodied in a publication dealing fully with the tidal and current phenomena of the waters constituting New York Harbor. The data will not only permit more accurate advance predictions of the tides and currents, but will also enable the Coast and Geodetic Survey to furnish information of value to the engineer, the mariner, the scientist, and the public generally, information which the public looks to the Coast and Geodetic Survey to furnish as the agency of the Government dealing with tides and related matters.

SAN FRANCISCO HARBOR.

It is planned to take up the various important harbors in turn, and in the early part of the fiscal year 1924 a comprehensive tidal

and current survey of San Francisco Harbor and its tributaries is to be made. The field work of this survey is to be made in cooperation with the United States Engineer Office, ninth district, San Francisco, Calif. In every case it is intended to cooperate fully with the United States Engineer Office, for this cooperation permits more effective and more economical means of carrying out the tidal and current surveys.

SUBSURFACE CURRENTS.

In the investigation of the flow and ebb of the current the velocity and direction of the subsurface currents are important features. Current meters for the determination of the velocity of subsurface currents have been known for a number of years and are well developed, but the determination of the direction of the subsurface currents has heretofore necessitated the use of delicate and expensive instruments. During the past year the Coast and Geodetic Survey has devised a simple and relatively inexpensive device for determining the direction of the subsurface currents, which is known as a bifilar suspension indicator. This was tried out in the New York Harbor current survey last year, and an improved form is now being made for use in San Francisco Harbor.

CHARTS AND PUBLICATIONS.

One of the best evidences of the bureau's service to the public is through the issue of its charts. Although the demand has fallen off somewhat since the war peak, it is still much above that of pre-war times. These charts and other nautical publications of the bureau can be obtained direct from its Washington office, the bureau's field stations at Boston, New York, New Orleans, Seattle, and San Francisco, or through any of the 140 authorized agencies which are located in the principal ports of the United States and possessions, as well as in some foreign countries.

These agencies are placed with commercial firms or individuals directly concerned in shipping interests, marine equipment or supplies and constant supervision is exercised over them through returns and inspections. The greatest effort is made by this bureau to prevent the sale or even free issue by any of its agents of superseded or obsolete charts, and rigid conformation to the terms of contracts is demanded.

An expeditious means for supplying information for correcting charts for all important changes and of advising of new prints and editions of charts and other nautical publications by this bureau is afforded by the weekly Notice to Mariners, published jointly by the Coast and Geodetic Survey and the Bureau of Lighthouses. An

added feature to these notices, instituted in May, 1923, in cooperation with the Bureau of Lighthouses and the Hydrographic Office, consists in publishing in bold-face type the numbers of charts to which hand corrections will be made showing the information contained in each notice.

PRESENT STATUS OF CHART CONSTRUCTION.

ATLANTIC COAST.

The reconstruction chart program for the Atlantic coast is partially accomplished and now awaits completion of additional surveys. The modification of existing charts of the West Indian Islands is dependent on the surveys now in progress, after the completion of which certain harbor charts of the Virgin Islands will be required.

PACIFIC COAST.

On the Pacific coast the existing series conform to the latest specifications, the work on the charts being limited to the correction of the present charts from new surveys by this and other organizations.

ALASKA.

A series of new charts of the waters along the west coast of Prince of Wales Island is being expedited as rapidly as the surveys are received. General reconstruction of Alaska charts is still postponed pending completion and adjustment of the precise triangulation and of various subordinate loops radiating therefrom.

For western Alaska the problem consists in the application of new surveys to existing charts.

PHILIPPINE ISLANDS.

The first charts printed in Manila after the establishment of the printing plant were made in February, 1922. During the fiscal year 1923 no less than 22,200 charts were printed from this plant, in addition to the reproduction of one of the Philippine Islands topographic maps. Since the establishment of this plant new charts and new editions of charts are transferred to aluminum and reproduced long before the smooth drawings could reach Washington for the same process. Thus the charts are placed in the hands of the public at a much earlier date.

SMALL CRAFT CHARTS, ATLANTIC COAST.

For the convenience of yachtsmen and owners of small craft a new series of charts is in project, covering the inside water route from Norfolk to Key West. This series will consist of 10 charts, 22 by 30 inches, printed on bond paper, each containing a number of strips from 6 to 8 inches wide. The strips are assembled largely from the published series of 1:80,000 charts.

The route as described in the inside route pilots will be shown by a heavy red line and the soundings will be charted in feet. Certain outside areas on the coast where the route passes through open waters will also be included.

This series will further meet the demands of the yachtsmen and small-craft owners in that the charts may be cut into strips and carried in folders which will readily adapt themselves to limited spaces.

PURCHASE OF DUTCH HARBOR.

I again urge the purchase of Dutch Harbor as a supply base for vessels of this bureau and other Government organizations operating in Alaskan waters. This bureau has always paid high prices for coal and fuel oil for its vessels in the vicinity of Dutch Harbor and there is always an uncertainty as to whether an adequate supply can be obtained from any source. With Dutch Harbor as a supply base there is every reason to believe that adequate supplies could be stored there for all Government needs and that the ultimate cost would be far less than under present arrangements.

Very truly yours,

E. LESTER JONES,

Director, Coast and Geodetic Survey.

BUREAU OF NAVIGATION.

DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, July 1, 1923.

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, 1923, comprised 27,254 vessels of 18,329,980 gross tons, compared with 27,358 vessels of 18,462,968 gross tons on June 30, 1922, a decrease of 104 vessels of 132,988 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, 1923, as 57,939,000 gross tons, of which Great Britain and Dominions have 21,296,000 gross tons and the United States is second with 12,416,000 gross tons (excluding the Great Lakes).

Of the above tonnage, 902 Shipping Board vessels of 3,813,404 gross tons and 216 privately owned American vessels of 512,587 gross tons were laid up on June 30, 1923.

On January 1, 1923, according to the Chamber of Shipping of the United Kingdom, there were laid up at the principal ports of the United Kingdom 403 ships of about 1,064,000 gross tons. This may be compared with 712 ships of about 1,961,000 gross tons laid up on January 1, 1922.

Following is a brief analysis of our shipping on June 30, 1917, as the United States entered the war, at the close of the fiscal year 1922, and on June 30, 1923:

June 30—	Grand total.		Seagoing.				Great Lakes.		All others.	
			Shipping board (over 1,000 gross tons).		Private owners (over 500 gross tons).					
	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.
1923..	27,254	18,329,980	1,498	6,861,241	2,035	6,242,547	2,720	2,758,401	21,001	2,467,791
1922..	27,358	18,462,968	1,711	7,686,973	1,933	5,664,323	2,745	2,723,857	20,969	2,387,815
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, 1923, there were building in American shipyards, including the Great Lakes, 208 vessels of 173,305 gross tons as compared with 105 vessels of 204,544 gross tons on June 30, 1922.

On June 30, 1923, the tonnage under construction in the world dropped from 7,400,000 in 1919 to 765 vessels of 2,543,856 gross tons, including, according to Lloyd's Register, 1,382,960 for the United Kingdom and British Dominions; 301,199 for Germany; 170,866 for France; and 72,767 gross tons for Japan. Of these vessels under construction 11 are over 20,000 tons, the larger number, 340, being under 2,000 tons; the average throughout the world is a little over 3,300 gross tons.

LOAD LINE.

It is proposed to bring to the attention of Congress during the coming session the growing necessity for load-line legislation.

The question is one which dates back to the Middle Ages. The records of the Italian Republics show that the agitation against overloading was not unknown at that time, and to secure safety for the crew and cargo it was found necessary to place some restrictions on the more careless owners. As stated in Lloyd's Gazette, the more modern history of this question dates from 1875, when the British merchant shipping act prescribed that all foreign-going vessels must have the load line marked on each side. The position of this mark, however, was not specified, but left entirely to the discretion of the owner, who could alter it at the beginning of any voyage. This condition was unsatisfactory. The problem was one of considerable complexity, and after long consideration the load-line committee of the board of trade submitted tables of freeboard giving the maximum loading which could be permitted with safety in cargo-carrying vessels. It was not until 1890 that the British load-line act was passed making it compulsory for the position of the load-line disk to be fixed in accordance with the board of trade tables.

These freeboard tables were revised in 1905, permitting vessels to load deeper than formerly, and as revised are still in force. Meanwhile, various other shipping countries adopted standards of freeboard which are accepted by the board of trade if substantially equivalent to the British standards. In all other cases foreign vessels trading with the United Kingdom are required to have a British freeboard.

The board of trade appointed a committee in 1913 to review the question and frame tables and regulations based on the most recent knowledge and experience. The report of the committee published in 1916 deals with practically every phase of the question.

The bill to establish load lines for cargo vessels (H. R. 3621) passed our House of Representatives unanimously in October, 1919, but was

not reported out of committee in the Senate. It is a measure 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. Solely out of courtesy other nations have refrained from applying to vessels of the United States their laws relating to load lines. These arrangements, however, can not be expected to continue indefinitely.

RADIO COMMUNICATION.

Of the many services performed by radio, unquestionably the marine service is the most valuable, where it is employed as a life-saving device to summon aid in the event of an accident endangering the safety of the vessel. There are numerous instances on record in the department where its use has been the means of saving the lives of the passengers and crew. The radio inspectors of the Department of Commerce are required to give first consideration to the inspection of radio installations on American and foreign vessels clearing from our ports. During the fiscal year 1923 there were 11,298 such clearances and 6,936 inspections, as compared with 10,240 clearances and 6,071 inspections in 1922. The number of inspections should be increased. To do this, additional men are needed at ports not now covered.

An illustration of the value of this inspection work is shown in a recent report from the Boston office. Upon inspection of the radio installation on a vessel about to clear it was found that the emergency source of power (storage battery) was inefficient and a new battery was required. This vessel ran aground on this voyage. It was necessary to extinguish the fires to prevent the boilers exploding, which discontinued the ship's main source of power and left the storage battery as the only means of operating the radio transmitter to send the S O S call and other messages which brought assistance and saved all persons on board. The vessel has been reported as a total loss.

Supplementing the regular ship radio service, there has been established free medical service for mariners. Any ship equipped with radio can secure medical advice from another vessel having a surgeon on board or from a coast station cooperating with the United States Public Health Service. The value of this service and particulars concerning specific cases treated have been noted frequently in the newspapers.

Our transoceanic communication system is materially strengthened by the nine radio circuits across the Atlantic and Pacific and additional circuits to Central America. It is estimated by radio-operating companies that from 20 to 30 per cent of the message traffic across the Atlantic and 50 per cent of the trans-Pacific business was

handled by radio in 1922. Obviously this forms an important service supplementing cables both in peace and war, safeguarding against interruption in service, and is a competitive check which should tend constantly to improve the service at the lowest practicable rates.

Radio broadcasting continues to hold the interest of the public in this country and is to a limited extent gaining recognition in other countries. We have now 573 broadcasting stations, as compared with 382 a year ago. The first broadcasting license was issued in September, 1921. In foreign countries there are but 63, Canada having 30 of these.

The permanency of this means of disseminating to the public news, entertainment, and instruction seems assured. It is not reasonable to expect a continuation of the rapid growth of broadcasting stations. Improved apparatus, greater care in providing high-class programs, and closer supervision by the radio inspection service to minimize the interference should guarantee a continued growth in the audience.

In order to secure the most successful and extended use of radio in the future legislative action along lines recommended to Congress last year is essential. It is becoming more difficult each year to apply the existing law of 1912 to services which not only did not exist but were not contemplated when the present law was enacted. For the purpose of considering what could be done from an administrative point of view to lessen the amount of interference in radio broadcasting the Secretary of Commerce called a conference which met in Washington on March 20. As far as practicable the recommendations offered by the conferees have been put into operation with encouraging prospects of resulting in considerable improvement.

There is no abatement in amateur activity. The number of licensed amateur transmitting stations has increased from 15,504 in 1922 to 16,570 on June 30, 1923. Serious effort is being made by the amateurs to improve their apparatus so as to reduce interference and increase the efficiency of their stations. Annually these experimenters conduct trans-Atlantic tests with European amateurs. The last test was in December, 1922, when 315 were successful in getting their signals across to Great Britain, France, and Switzerland. The record compiled by the American Radio Relay League shows that each of the nine radio districts had a successful representative.

Few realize the importance of our amateur auxiliary communication system which can be put into immediate operation and temporarily provide a means for dispatching trains, giving flood warnings, and transmitting emergency messages to and from sections temporarily deprived of wire facilities.

To perform satisfactorily the constantly increasing duties in this branch of the service it is essential that a larger appropriation be provided. Such work as the inspection of ship stations for the safety of life, the inspection of broadcasting stations to prevent interference and permit simultaneous operation, and the inspection of amateur stations to prevent interference with the broadcast listeners and with commercial and ship stations are some of the important duties which should not be neglected.

MOTOR SHIPS (INTERNAL COMBUSTION).

On July 1, 1923, American documented seagoing vessels of this type of 1,000 gross tons and over (excluding the Great Lakes) aggregated 52 vessels of 139,593 gross tons.

Existing laws covering the inspection and manning of this class of vessels are unsatisfactory. Passed when these vessels were small and not in general use, section 4426 of the Revised Statutes is inadequate to the present large motor ships, especially those carrying only the owners' merchandise, while there is no provision for the inspection of or licensed officers on motor tug boats.

An amendment to these laws will be presented for your consideration, the bureau deeming action along these lines essential to safety and uniformity in our inspection system.

ADMEASUREMENT OF VESSELS.

The highly technical work of this service, handicapped by the necessity of its performance by admeasures and employees selected, appointed, and paid by another department, is increasing in difficulty and volume.

Constant effort is being made by the adjuster of admeasurements and through instructions issued by the bureau to unify and standardize this work. Uniform application of our laws and regulations is essential to prevent discrimination against American vessels and bring our admeasurement system up to the standard of other maritime nations. In order to accomplish this result effectually it doubtless will be necessary, as stated in my report last year, to reorganize this service based on shipbuilding lines rather than on customs districts, and secure the employment of men specially trained for this service.

This service affects over \$2,000,000 direct revenue to the Government in addition to all Panama Canal tolls, all vessels passing through that canal being taxed on the basis of our admeasurement.

Sufficient importance has been attached to this work by maritime nations to justify them in requiring long apprenticeships before permitting the actual admeasurement of a vessel and the establish-

ment of an elaborate system of review by a highly trained central authority. In the United States much of this work is performed by men with a limited knowledge of the law and regulations and less knowledge of ship architecture or the mathematical training to solve geometrical problems often involved.

These officers are appointed primarily as customs officers and selected because of their familiarity with such duties, the work of admeasurement being incidental thereto. They have no reasonable opportunity or incentive to thoroughly acquaint themselves with admeasurement technicalities.

ENFORCEMENT OF THE NAVIGATION LAWS.

The various services of the department and the customs service of the Treasury Department reported during the year 11,251 alleged violations of the navigation laws. The notable increase from 497 reported violations of the steamboat-inspection laws and the seamen's act last year to 1,100 for 1923 is due principally to the seamen's strike on the Great Lakes during the fall of 1922.

The enforcement of the numbering act of June 7, 1918, is continuing successfully, 166,413 undocumented motor boats having been recorded as of June 30, 1923. In the New York district there are 22,776 of these numbered vessels, Tampa, Fla., the next largest district, having 12,309 such vessels. The importance of the act is particularly apparent in the Florida district, where it is estimated by the customs officers that a large proportion of these vessels are engaged in smuggling liquors and aliens from near-by islands. Without these identifying numbers a check on this illegal traffic would be much more difficult. The same conditions apply along the Canadian frontiers.

During the past year I have personally visited many of our ports on the Atlantic seaboard, the Great Lakes, the rivers, and the Gulf of Mexico. On these waters not less than 200,000 motor boats of varying size carry millions of people yearly in commerce and for pleasure. This is perhaps the most dangerous form of navigation. Fire from gasoline, damage from floating or hidden obstructions, and danger of collision with larger vessels all emphasize the necessity for the equipment and navigation of these vessels as required by law. The majority of motor-boat owners, for their own protection, carry this equipment, but there are about 10 per cent of such owners who fail to do so or who navigate their vessels recklessly, without regard to the rules of the road, endangering all others in their vicinity.

The Atlantic seaboard and the Gulf coast are fairly well patrolled by our five inspection vessels, which go into every harbor, inlet, and bay from Eastport, Me., to Galveston, Tex. Last year these five

vessels made 31,691 inspections and reported 5,504 violations of law. In addition to the revenues from fines imposed in these cases these five vessels cooperate with the Internal Revenue Bureau in the collection of taxes on pleasure vessels, thus producing directly and indirectly a revenue, which otherwise would not be collected, at least equal to the entire cost of their operation.

EXTENSION OF INSPECTION SERVICE.

Our inspection service, outlined above, covers only the Atlantic and Gulf coasts. On the Great Lakes, where there are 24,588 small motor vessels already numbered, and doubtless many which have not complied with the law, on the rivers with their 14,145 such vessels, and the Pacific coast with 16,351 numbered vessels, the department has no water facilities for this work.

The employment of our inspection vessels on the coast has proven eminently successful in safeguarding life and the collection of revenue. I believe that a similar service on the Great Lakes, the rivers, and the Pacific will be equally successful.

Because of the short season on the Lakes, the peculiarities of navigation on the rivers, and the long distances between ports on the Pacific, I propose asking Congress for an appropriation of \$250,000 for the purchase and operation for the year of 10 fast 45-foot motor inspection boats, to carry a crew of three men each, and capable of covering a wide radius of action in harbors and the more protected waters. If the experience of these vessels is similar to the results obtained by those already in operation, they should be a source of revenue to the Government, and thus the means of safeguarding without cost the lives of multitudes of our people who use these small vessels for pleasure and business.

In addition to inspecting small vessels they would do much to insure the proper manning and equipment of the large steam vessels and prevent their carrying a dangerous excess of passengers.

This service has directly to do with the safety of lives and property, and I feel justified in strongly urging its extension.

SHIPPING COMMISSIONERS.

During the year 538,755 officers and men were shipped, reshipped, and discharged before shipping commissioners, compared with 541,952 for the previous fiscal year and 378,772 for the year 1914. The average cost per man was 17 cents, the same as for 1922 and also 1914. Collectors of customs acting at ports where shipping-commissioner offices have not been established shipped and discharged during the year 28,642 officers and men, as compared with 47,200 officers and

men during the previous year. American consuls shipped and discharged during the year 52,896 men.

Of 276,093 officers and men shipped before shipping commissioners 116,325 were native Americans, 41,015 naturalized Americans, 156,340 in all, or 56 per cent, compared with 54 per cent the previous year.

For many years it has been the practice of the bureau to recommend the establishment of a shipping commissioner's office at ports where for a consecutive number of years the collectors of customs acting as shipping commissioners have shipped and discharged in excess of 1,000 men. The increase in the work at Mobile, Ala., and Portland, Oreg., has been such as to require shipping offices at those places. At Mobile in 1920 there were 12,340; in 1921, 13,943; and in 1922, 7,505 men shipped and discharged. At Portland, Oreg., 4,688 in 1920, 4,907 in 1921, and 6,362 men in 1922 shipped and discharged. The number of questions arising for adjudication in such a large volume of business requires the attention of a shipping commissioner trained to the law and the customs of the sea. The shipping commissioners serve in a semijudicial capacity, their findings as to questions of fact being by statute made final.

The service at present is underpaid, both shipping commissioners and their deputies. We can not expect to secure men qualified to carry on independent offices requiring intimate knowledge of one of the large titles of our statutes, judicial temperament, unusual judgment, and the assumption of large responsibilities at salaries in many instances less than is being paid to clerks.

The Government service, in order to secure the best material, should hold out to young men the possibility of their making such services their life work. The appropriation for deputy shipping commissioners, however, has for years carried a restriction that no man in that service may be paid more than \$1,600 a year. How can we expect an energetic, ambitious young man to enter and remain in such a service? He has no incentive to perfect himself, to become an expert in his line. It is an antiquated provision and should be removed.

PREVENTING OVERCROWDING OF EXCURSION STEAMERS.

During the fiscal year 1923 passengers were counted on 9,524 trips of excursion steamers, the number of passengers aggregating 6,143,081. Of this number navigation inspectors made 6,579 counts of 3,006,588 passengers. On 403 occasions it was found necessary to stop passengers going on excursion boats, the limit of safety having been reached. This involved the safety of 250,819 passengers.

The importance of this service in its direct relation to safety to life is growing each year. The public is entitled to the protection of

the laws they have placed on the statute books and to a considerable extent rely on that protection. So far as the limited facilities will permit, the work is being well done. The cooperation of the great excursion industry of the country is, of course, general, without which the department and its small force of inspectors would avail little. In this, as in all other laws enforced by this bureau, the steamboat owner is found diligent to comply with such laws, the deliberate violation being the rare exception.

NAVIGATION RECEIPTS.

The receipts from tonnage duties during the fiscal year amounted to \$1,688,786.68, including \$11,957.60 alien tonnage tax and light money, compared with \$1,843,148.34 collected from the same sources last year. These taxes and also the navigation fees and fines are collected by the 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.
1923.....	\$1,688,786.68	\$221,678.56	\$36,914.62	\$1,947,379.86
1922.....	1,818,330.70	200,445.80	56,443.44	2,075,219.94
1917.....	1,393,743.16	159,808.03	49,962.37	1,603,513.56

The Bureau of Navigation is a revenue-producing bureau. The collection of this revenue, however, is but incident to the great work of enforcing the laws under its jurisdiction. The figures are interesting in showing a source of revenue and also the close relation of the bureau's work to the shipping industry of the country.

NAVIGATION APPROPRIATIONS.

The appropriations for the bureau for the past fiscal year compared with those for the years ended June 30, 1922 and 1917, were as follows:

June 30—	Bureau.	Shipping service	Tonnage adjustment.	Counting passengers.	Navigation laws.	Wireless laws.	Total.
1923.....	\$42,789	\$110,600	\$3,760	\$10,250	\$60,000	\$130,000	\$357,399
1922.....	42,780	115,200	3,760	15,250	60,000	80,000	316,990
1917.....	37,780	74,425	3,000	18,250	26,500	45,000	204,955

It will be noted that the only material proportionate increases in these appropriations are for enforcement of the navigation laws due to acquiring three additional inspection vessels from the Navy at the close of the war and that for the enforcement of the wireless law due to the unprecedented development and use of this means of communication, especially for broadcasting. Congress through new legislation has considerably increased the scope, responsibility, and importance of the work, while the clerical force and compensation rolls have remained nearly stationary. This has resulted in the loss of most of our trained men and the bureau is more and more handicapped by the inexperience of most of its administrative force. This work, however, is thoroughly systematized and I feel justified in reporting to you that the Bureau of Navigation, with its limited forces, is carrying on its functions with a degree of efficiency perhaps never excelled in its history.

Very truly yours,

D. B. CARSON,
Commissioner of Navigation.

STEAMBOAT INSPECTION SERVICE.

DEPARTMENT OF COMMERCE,
STEAMBOAT INSPECTION SERVICE,
Washington, July 1, 1923.

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:

ORGANIZATION.

The following positions were embraced in the Steamboat Inspection Service at the close of business on June 30, 1923:

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.....	92
Total.....	361

The boards of local inspectors at Burlington, Vt., and Apalachicola, Fla., and the supervising inspectorship at Pittsburgh, Pa., have been discontinued by the department, and efforts are being made to have these positions abolished by congressional action. On July 1, 1922, four additional assistant inspectorships were made available, the same having been created by law, two at Mobile, Ala., and two at Galveston, Tex.

STATISTICS.

The force inspected and certificated 7,653 vessels, with a total gross tonnage of 14,982,850, of which 7,316 were domestic vessels, with a total gross tonnage of 11,659,374, and 337 were foreign passenger

steam vessels, with a total gross tonnage of 3,323,476. Of the domestic vessels, there were 5,941 steam vessels, 790 motor vessels, 19 passenger barges, and 566 seagoing barges. There was an increase of 110 in the total number of vessels inspected and an increase of 1,050,973 in the total gross tonnage of vessels inspected as compared with the previous fiscal year. There were 755 cargo vessels examined to carry persons in addition to crew under the provisions of the act of Congress approved June 5, 1920. Letters of approval of designs of boilers, engines, and other operating machinery were granted to 32 steam vessels, with a total gross tonnage of 971. There were inspected for the United States Government 50 hulls and 1,983 boilers. There were 2,774 reinspections of steam vessels, motor vessels, and barges.

Licenses were issued to 25,052 officers of all grades. There were examined for visual defects 7,917 applicants for license, of whom 23 were found color blind or with other visual defects and rejected. Certificates of service were issued to 10,456 able seamen and 890 were rejected. Certificates of efficiency were issued to 14,913 lifeboat men and 4,234 were rejected.

Steel plates for the construction of marine boilers to the number of 2,689 were inspected at the mills and a large amount of other boiler material was inspected. There were examined and tested 166,434 new life preservers, of which number 4,398 were rejected. There were 478 wooden life floats inspected, of which none was rejected. There were inspected 6,860 cork ring life buoys, of which number 149 were rejected. There were inspected at factories 425 new lifeboats, of which 9 were rejected. There were inspected at factories 104 new life rafts, of which 1 was rejected. There were tested by firing 20 line-carrying guns, all of which passed.

The total number of accidents resulting in loss of life was 197. The total number of lives lost was 247, of which 59 were passengers. Of the lives lost 166 were from suicide, accidental drowning, and other similar causes, leaving a loss of 81 as fairly chargeable to accidents, collisions, foundering, etc. There was a decrease of 19 in the number of lives lost as compared with the previous fiscal year.

Passengers to the number of 323,130,362 were carried on vessels required by law to make report of the number of passengers carried. Dividing this number by 59, the total number of passengers lost, shows that 5,476,785 passengers were carried for each passenger lost. The number of lives directly saved by means of the life-saving appliances required by law was 907.

STABILITY TESTS.

The rule adopted by the board of supervising inspectors in January, 1922, with reference to stability tests has proved most valuable

and efficacious, and it is not a question open to debate or dispute as to the wisdom of this rule. Eighteen stability tests were conducted by the traveling inspector who has headquarters in the central office, and in the conducting of these tests as little inconvenience as possible has been occasioned the vessels, the very best service possible being rendered.

WORK OF TRAVELING INSPECTORS.

There are at present three traveling inspectors in this service. One has his headquarters at San Francisco, Calif., one at Cleveland, Ohio, and one in the central office at Washington. The traveling inspector with headquarters at San Francisco, Calif., during the fiscal year made reexaminations of vessels on the Pacific coast in the local districts of Seattle, Wash., Portland, Oreg., and San Francisco and Los Angeles, Calif., and at the end of the fiscal year was ordered to report at New York City to conduct inspections of vessels along the upper Atlantic coast. The traveling inspector having his headquarters at Cleveland, Ohio, made reexaminations during the fiscal year of vessels on the Great Lakes and at the end of the fiscal year was ordered to the south Atlantic coast. The work is arranged in this manner so that the traveling inspectors may not only take care of their own work but may gain a perspective of inspection in the different parts of the country and be in a position to make reports to the central office, enabling it to improve the standard of inspection and increase uniformity.

OIL POLLUTION.

A question that has received the attention of this service has been the matter of oil pollution of the navigable waters of the United States. This matter has been receiving the attention not only of authorities in this country but of those in Europe as well. This service has cooperated and collaborated with the Bureau of Mines, Department of the Interior, with a view to obtaining data that will put the authorities of this country in possession of facts that will enable them to make intelligent recommendations at any international conference that may be held, having in mind the thought of preventing pollution of navigable waters. This question touches the interests of all of the people, especially from the standpoint of health.

GRADUAL EXPANSION.

Reference was made in the last annual report to the necessity, proceeding in conformity with the wishes of the President, of this service doing its part in the matter of retrenchment, and of the discontinuing of 39 assistant inspectorships, as well as the supervising inspectorship at Pittsburgh, Pa., and of the closing of the

offices of the local inspectors at Burlington, Vt., and Apalachicola, Fla. That procedure resulted in a saving of \$83,475.06 without impairing the efficiency of this service. While that be true, it is to be remembered that shipping is gradually recovering, and just as rapidly as it does recover it will be necessary to have increased numbers in the inspection force to maintain the efficiency of this service.

So far as the clerical force of this service is concerned, it has always been undermanned; and were it not for the faithful service rendered, this service would not be able to keep abreast of the work and give efficient service to the public. There will be three additional clerkships for the field available July 1, 1923, and it is possible that more will have to be asked for in the near future.

REAPPOINTMENT OF ASSISTANT INSPECTORS.

In discontinuing the 39 assistant inspectorships in this service it was necessary to discontinue the services of 36 assistant inspectors, and as vacancies occur these men are being given preference in the matter of appointment. Since July 31, 1921, when these men were dropped, 22 have been reinstated, 3 have declined reinstatement, and there are still 11 to be reinstated. It is hoped that within the next year or 18 months it may be possible to reinstate this remaining number. This possibility may come about as a result not only of the usual turnover of force but also as the result of possible gradual expansion of the inspection force.

DESIRABLE LEGISLATION.

There is certain legislation that is desirable for this service.

That which is very essential is the amendment of sections 4433 and 4418, Revised Statutes, in regard to the working and hydrostatic pressure of boilers. It is necessary that the rules and regulations in this respect be made modern, but they can not be made modern until authority is given by Congress.

It is also desirable that section 4404 of the Revised Statutes be amended so as to provide that the supervising inspectors of this service be included under the classified civil service.

Again, it is desirable that sections 4404 and 4414, Revised Statutes, be amended so that the number of supervising inspectors be reduced from 11 to 10 and the offices of the local inspectors at Burlington, Vt., and Apalachicola, Fla., be abolished. The object in reducing the number of supervising inspectors from 11 to 10 is to abolish the office of supervising inspector of the seventh district located at Pittsburgh, Pa., for the reason that this office is not necessary. The work of the seventh district since the death of the last supervising inspector of

that district has been satisfactorily performed by the supervising inspector of the sixth district, located at Louisville, Ky.

On account of the small amount of work in the district of Burlington, Vt., it could easily be taken over by another board of local inspectors. When vacancies happened in the positions of the two local inspectors by the retirement of one and the death of the other the work of the office was taken over by the local inspectors at Albany, N. Y., in March, 1922, and has since been carried on by that board without impairment of the efficiency of the service and with an estimated annual saving of \$5,500.

This same condition is also true of the work in the district of Apalachicola, Fla.; and the work of that office was taken over by the local inspectors at Mobile, Ala., and has since been performed by that board without impairment of the efficiency of the service and with an estimated annual saving of \$4,500.

Very truly yours,

GEO. UHLER,

Supervising Inspector General.

INTER AMERICAN HIGH COMMISSION.

INTER AMERICAN HIGH COMMISSION,
Washington, July 1, 1923.

HON. HERBERT HOOVER, Chairman,

United States Section, Inter American High Commission.

MY DEAR MR. CHAIRMAN: In the period comprised between July 1, 1922, and June 30, 1923, the United States section of the Inter American High Commission held two meetings, one on October 14, 1922, the other on January 10, 1923.

The first one was devoted to the study of the program to be followed during the winter, with special attention to some of the major problems, like exchange and protection of trade-marks.

No acceptable plan for the stabilization of exchange in the American Continent has yet materialized, but the educational results of the discussions on this matter have been considerable. The disastrous effects of unsecured issues of paper money upon exchange are now generally recognized, and it is agreed that a depreciated currency is never beneficial in the long run to the domestic industries of a nation. Opinion is practically unanimous that exchange can best be improved by rigid economies in both Government and private expenditures.

In view of the existing difficulties in having the convention for the protection of trade-marks, signed in Buenos Aires in 1910, put in force in all the American countries, a special study was made of that document with a view to reform it, taking into account the objections submitted by Latin American countries.

The section also studied the subjects of The Hague Rules of 1921 on bills of lading, enforcement of commercial arbitration awards, customs and port procedure, standardization of commodity classification and mechanical specifications, and the cooperation of the Inter American High Commission with the Fifth International Conference of American States, which was to meet in Santiago de Chile in April of this year. In the meeting of January 10, further reports on exchange and banking, trade-mark protection, commercial arbitration award treaties, and The Hague Rules of 1921 on bills of lading were submitted, as well as special reports on customs and port procedure and industrial and commercial standardization.

A letter from the Secretary of State requesting suggestions in relation to the Fifth International Conference of American States was:

read, and it was decided to send the Secretary of State memoranda along the lines of work done by the commission and to concentrate the efforts of the United States section in the preparation of material for this conference.

The report on trade-mark protection was accompanied by a proposed convention to take the place of that signed in Buenos Aires in 1910. This proposed convention was accompanied by explanations of the changes suggested. Through the central executive council it was distributed among the other national sections, and in this way the field was prepared for a profitable discussion of the subject at the Fifth Pan American Conference.

As a result of the resolutions taken at this session, memoranda were prepared on Topics I, V, VI, and XI of the program of the Fifth International Conference, to wit:

- (a) Convention for the protection of trade-marks.
- (b) Convention on literary and artistic copyright.
- (c) Improvement of ocean transportation facilities.
- (d) Intercontinental railroad and motor transportation.
- (e) Policy, laws, and regulations concerning commercial aircraft; the advisability of an international technical commission on the location of standard landing places, the determination of aerial routes, and the formulation of special customs procedure for aircraft.
- (f) Cooperation of the Governments of the American Republics in reference to all kinds of wireless communication in America, and by means of agreements for its regulation.
- (g) The uniformity of customs regulations and procedure.
- (h) The uniformity of shipping and insurance documentation.
- (i) The uniformity of principles and interpretation of maritime law.
- (j) The uniformity of nomenclature for the classification of merchandise.
- (k) Uniform parcels-post procedure and consideration of the Pan American parcel post convention.
- (l) Advisability of adopting conventions in order to make effective Resolution XVII, voted by the Second Pan American Financial Congress which assembled at Washington in January, 1920.¹
- (m) Consideration of the best means to promote the arbitration of commercial disputes between nationals of different countries.

Mainly as a result of the efforts of the Inter American High Commission, a new convention for the protection of trade-marks was signed in Santiago de Chile. It is incumbent on the Inter American

¹ This resolution reads as follows: "Resolved, That it being in the interest of all nations that there should be the widest possible distribution of raw materials, the importation of such materials into any country should not be prevented by prohibitive duties."

High Commission to promote its ratification and enforcement in all the Continent. Resolutions recommending the publication of uniform statistics of foreign trade and the publication of a handbook on customs regulations are the result of studies of the Inter American High Commission; the handbook referred to is to be published by the central executive council of this organization.

The Fifth Pan American Conference passed a resolution which reads:

Resolved, To ask the Inter American High Commission to cooperate toward the drawing up and enforcement of the program of the International Conference of American States in so far as it bears directly on purposes and work of the Inter American High Commission.

On account of this resolution the Inter American High Commission has had to enlarge its original program, adding to it the resolutions taken by the conference in all matters having economic implications. In this connection special mention must be made of the preparation for various technical conferences to be held at dates and places to be determined by the governing board of the Pan American Union. The most notable of these are, respectively, conferences on motor roads, on standardization of specifications of merchandise, on electrical communications, and on commercial aviation.

The staff of this office has continued to work on the preparation of a report on company laws on the American continent. The part covering the laws of Latin America is complete. It was necessary to suspend the publication of the part corresponding to the United States on account of the probability that important changes will be made in the law of the State of New York this fall. The information relating to Latin American laws will be published separately from that dealing with the laws in the United States.

The staff was also engaged in studies preparatory to a report on admiralty law. It is expected that this report will be ready by the middle of this fiscal year.

The United States section is also engaged in the collection of economic information for the members of the different group committees and for other persons who might be interested in it. The secretary is more and more frequently called upon by the other sections for material, opinions, or suggestions relating to the economic, financial, and commercial problems which form part of the field of activities of the Commission.

Respectfully,

GUILLERMO A. SHERWELL,
Secretary.

