TWENTY-THIRD

ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

▼

1935

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1935

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CONTENTS

REPORT BY BUREAUS

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OF THE

SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, November 1, 1935.

To the CONGRESS OF THE UNITED STATES:

I have the honor to submit herewith the Twenty-third Annual Report of the Secretary of Commerce, covering the fiscal year ended June 30, 1935.

EXPENDITURES

The Congress directly appropriated a total of $36,133,439 for the regular expenditures of the Department of Commerce for the fiscal year ended June 30, 1935. During this period, funds transferred from other departments, in addition to the regular appropriations, brought the total disbursements to $45,780,281. Miscellaneous receipts totaled $9,032,473, making a net outlay of $36,347,808.

The data in the following section of this report show the special emergency appropriations granted to the Department and how these funds were allotted to the various bureaus.

PUBLIC-WORKS ALLOTMENTS

All items relating to public works and construction activities were eliminated from the regular annual appropriation for the Department with the understanding that applications would be submitted to the Federal Emergency Administration of Public Works for such funds for work of this character which might be deemed necessary.

The following allotments were granted by that organization to this Department and obligated by June 30, 1935:

Bureau	Allotments, fiscal year 1934	Allotments, fiscal year 1935	Total allotments	Obligations to June 30, 1935
Air Commerce	$2,058,803	$993,075	$3,051,878	$2,561,065
Coast and Geodetic Survey	6,503,120	1,429,800	7,932,920	6,770,353
Fisheries	639,500	1,500	641,000	599,485
Lighthouses	5,620,334		5,620,334	5,391,527
Navigation and Steamboat Inspection	33,043	60,000	93,043	90,973
Standards	100,000		100,000	99,601
Total	14,954,800	2,484,375	17,439,175	15,513,004

The work performed by the various bureaus under allotments from this agency is discussed in greater detail under the chapters of this report dealing with the activities of the respective bureaus.

CHANGES IN ORGANIZATION

The activities of the Minerals Division (Bureau of Foreign and Domestic Commerce) concerned with economic and statistical analyses of mineral commodities were transferred from that Bureau to the Bureau of Mines, Department of the Interior, pursuant to the provisions of Interior Department Appropriation Act for the fiscal year 1936, approved May 9, 1935.

Owing to the failure of the Congress to appropriate funds, the Federal Employment Stabilization Office went out of existence at the close of June 30, 1935.

FUNCTIONS OF THE DEPARTMENT

The functions of the Department of Commerce are directed toward the promotion of industry and commerce and the protection of life and property in the air, on the land, and on the sea. During the past year the greater part of the budget of the Department was spent in guarding the interests and welfare of human life and property.

This protection is one of the chief concerns of several of the Department's bureaus. In the year covered by this report, 65 percent of the funds appropriated to the Department were devoted to the maintenance and operation of lighthouses; to marine inspection; to the interest of safe navigation of coastal and inland waters; to aeronautic inspection, and the regulation and protection of air traffic; and to the safeguarding of the public against false weights and measures.

In addition to these regulatory functions, the Department has promotive services in the interest of industry and trade in general. These include aids in simplifying procedure for increasing and improving output; in eliminating waste in production and distribution; and in relieving the unemployment situation. It promotes the conservation and growth of the country's fisheries; aids and protects inventions through the issuance and registration of patents; collects and tabulates population figures and other statistical data useful to the public, business, and the Government itself through the activities of the Bureau of the Census. The shipping interests of the Nation are guided and assisted in their operations; and finally, trade information and data valuable to American business are collected from all parts of the world, classified, and distributed for the use of American business and industry.

ECONOMIC REVIEW

The fiscal year 1935 marked the second year of sustained recovery from the depression which reached its depth during the fiscal year 1932–33, after an almost continuous decline since 1929. Perhaps the outstanding feature of the fiscal year just past was the better balanced relationship established in our whole national economy, following the irregular improvements which characterized the pre-

ceding year. As a result, the qualitative changes were of a significance comparable with the quantitative gains of the year.

The visible evidence of the enhanced individual welfare and security in the past year is supported by the statistical indicators of progress. Taking only the most inclusive of these data—the estimates of national income—it is significant to note that a considerable increase was registered during the fiscal year. Complete data are not available for fiscal periods, but in the calendar year 1934 national income paid out amounted to $49,440,000,000, an increase of approximately $5,000,000,000, or 11 percent, over the preceding year. Each of the major industrial classifications, with one exception, and all major types of payments, except interest, shared in the rise. At the present time, sufficient data are available to estimate the current trend of national income with reasonable accuracy. On the basis of these data, it is estimated that the national income paid out during the first half of the calendar year 1935 was between 5 and 10 percent higher than in the corresponding period of 1934. Especially noteworthy was the fact that net business losses, which were estimated at approximately $10,000,000,000 in 1932, were reduced to about a fifth of that figure in 1934, and available evidence indicates that these have been almost entirely eliminated during the current calendar year.

Among the qualitative changes witnessed during the fiscal year may be mentioned the following: (1) The further improvement in the agricultural industry; (2) signs of revival in the capital-goods industries, notably in the residential-construction field in the latter part of the year; (3) wide-spread improvement in consumer purchasing, resulting in a somewhat better balance in production and distribution than existed in the preceding year; (4) a better balanced price structure, with farm products and raw materials advancing and prices of finished products remaining approximately unchanged; (5) an improved banking structure capable of meeting all demands for credit; (6) a reopening of the capital markets to the flow of funds, although refunding issues have predominated; (7) a strong bond market; and (8) considerable improvement in the real-estate field. To summarize, the year brought a strengthening of many weak spots in the national economy and laid a basis for further progress toward satisfying the vast accumulation of needs which had been built up during the depression years.

Profits in business generally have substantially increased, and earnings of industrial corporations in the latter half of the year reached the highest level since 1930. An exception to the general increase in profit gains is noted in the earnings of railroad and public-utility industries. The railroads have recently been operating with a larger deficit than the year previous while profits in the public-utility field are comparatively the same.

A tabulation of the profits of 388 industrial corporations for the latter half of the fiscal year show a total of $437,600,000, compared with $380,700,000 in 1934 and $77,000,000 in 1933.

Major economic indexes

[Based on calendar-year average 1923–25 as 100, except cash income from farm marketings which is based on calendar-year average 1924–29 as 100]

Year ended June 30 and month	Industrial production [1]	Manufacturing production [1]	Cash income from farm marketings [1]	Class I railroads, ton-miles freight carried	Electric-power production	Department-store sales, value [1]	Factory employment [1]	Factory pay rolls	Wholesale prices	Construction contracts awarded, value
1920	89	91	-------	96	-------	88	112	112	152	77
1921	74	73	-------	90	70	92	92	97	123	51
1922	74	75	-------	79	72	84	84	74	93	70
1923	98	98	-------	96	88	94	99	95	101	83
1924	98	97	-------	98	95	99	102	102	97	89
1925	99	99	99	98	102	100	96	96	100	101
1926	105	106	103	105	116	104	101	103	102	130
1927	109	108	100	111	129	107	100	104	96	130
1928	106	106	100	104	138	107	98	100	95	133
1929	118	118	100	110	154	110	103	107	96	127
1930	110	110	98	104	163	108	101	102	92	107
1931	87	86	72	86	155	99	84	77	79	76
1932	70	69	51	66	146	80	71	56	68	40
1933	67	66	45	57	136	64	62	42	63	23
1934	83	82	57	67	149	72	78	60	72	34
1935	81	80	61	67	156	76	79	65	78	28
Percentage change:										
1935 from 1933	+20.9	+21.2	+35.6	+17.5	+14.7	+18.8	+27.4	+54.8	+23.8	+21.7
1935 from 1934	−2.4	−2.4	+7.0	-------	+4.7	+5.6	+1.3	+8.3	+8.3	−17.6
Monthly trend, fiscal year 1934–35:										
July	76	74	73	65	152	73	80	61	74	27
August	73	72	66	68	154	77	79	62	76	27
September	71	69	56	69	144	75	74	58	77	29
October	73	72	58	71	156	73	77	61	76	31
November	75	73	56	64	152	74	77	60	76	31
December	80	85	56	62	161	78	79	63	76	31
January	90	90	55	67	167	74	81	64	78	27
February	89	88	58	65	149	75	82	69	79	28
March	88	86	60	74	160	82	82	71	79	26
April	86	86	69	63	156	73	82	71	80	27
May	85	84	64	66	160	76	81	69	80	27
June	86	84	60	70	157	80	80	67	79	29
Comparison final month of fiscal years 1929–35:										
June 1929	125	127	94	109	155	113	106	111	95	126
June 1930	98	97	89	92	155	103	93	92	86	99
June 1931	83	82	58	76	150	96	79	70	72	63
June 1932	59	58	39	50	131	69	62	43	64	27
June 1933	91	93	70	64	144	68	67	47	65	18
June 1934	84	83	66	68	149	74	82	65	74	26
June 1935	86	84	60	70	157	80	80	67	79	29

[1] Monthly figures adjusted for seasonal variation; cash income from farm marketings does not include rental and benefit payments.

Movement of commodity prices

The even trend of commodity prices, other than foods and farm products, during the fiscal year was in sharp contrast to the violent movements of the preceding fiscal period. On the whole, the year was characterized by a rather remarkable stability of prices of industrial articles at the level established in 1933–34. Business interests have enjoyed whatever advantages are to be derived from a relatively stable general price level for more than a year and a half, with prices of many individual commodities tending to reflect the influences of the demand-supply condition pertaining to particular products.

Farm and food prices rose substantially during the year. The 27-percent increase in prices of farm products and the 20-percent

rise in wholesale food prices advanced the general price index 8.3 percent above the average for the preceding fiscal year. The year's changes, in general, brought a better balanced relationship as between farm and industrial commodities. On the basis of 1926 as 100, the various wholesale price indexes for the final week of the fiscal year were as follows: All commodities, 80.5; farm products, 79.2; foods, 86.0; and "all other", 78.1.

The increase in food prices was a major factor in the increased cost of living. However, the advance in living costs was moderate, and was more than off-set by greater purchasing power. Average weekly earnings of factory workers, for example, were up 6.3 percent while their living costs advanced 4.7 percent, according to figures from the National Industrial Conference Board. As compared with 1932–33, the rise in the income of factory workers has been much more rapid than the advance in their living costs.

The trend of retail prices, other than foods, tended to follow the even course of wholesale prices of the corresponding types of merchandise. Fairchild's index moved slightly lower during the year, but averaged the same as for the preceding period, and was 21 percent higher than in the fiscal year 1932–33.

Agricultural income higher

The improvement in rural areas has been one of the major factors in the recovery experienced to date. Whereas, in 1932 the farm population was struggling with extremely low prices, an unbearable debt burden with its resulting train of foreclosures, bank failures, general unrest and insecurity which reduced the consumption of industrial commodities in rural areas to a minimum, in the past year income has been expanded to a point which not only provides some margin above existing obligations but permits the purchase of new equipment and supplies. The extensive refinancing of farm mortgages on easier terms has also been influential in easing the burden of fixed charges.

Notwithstanding the effects of one of the most severe droughts in history, which drastically cut the yield of agricultural crops and reduced the number of livestock, cash-farm income (including rental and benefit payments) for the fiscal year was 26 percent higher than in 1934 and 60 percent above that for 1933. Income from crops was about 6 percent larger than in 1934, while the increase in the income from livestock amounted to almost one-fifth. Cash rental and benefit payments of $712.000,000 were 129 percent larger than in the preceding fiscal year and were the equivalent of 12 percent of the farm income from marketings.

The yield of 1934 crops was the lowest in 40 years, according to data of the Department of Agriculture, and on a per capita basis was the lowest since 1866, the first year for which data are available. In the calendar year 1935, a considerable gain in crop production is indicated by the crop estimates, but the yield is expected to be below normal.

While the crop disasters of 1934 bore heavily on individual farmers and particular areas of the country, they resulted in a considerably higher price level for farm products and also a marked decline in the large agricultural surpluses. Stocks of the principal farm products,

with the notable exception of cotton, did not present a problem at the close of the fiscal year.

Prices of farm products rose rapidly during the year, the Department of Agriculture index advancing from 85 in June 1934 to a high of 111 in February, following which there was a recession to about 102 in the final month of the fiscal period. Prices averaged 27 percent above the preceding fiscal year.

Industrial production still low, but increasing

The opening month of the fiscal year brought a sharp downward readjustment of industrial production as a result of the overexpansion in operations in the final quarter of the preceding fiscal year. The trend was downward until October, when the adjusted index of the Federal Reserve Board stood at 71 percent of the 1923–25 average as compared with 86 in the preceding April and May, but in the four months ended January the index rose to 90, from which point it receded to 86 by the final month of the year.

Industrial output for the year, as measured by the Federal Reserve Board's index, was slightly less than in the preceding period but was 21 percent above the fiscal year 1932–33. The failure of the Board's index to advance further was due to the inability of certain major industries to maintain the fast pace set in the initial recovery year. Thus, while pig-iron production was double the output in 1932–33, it was 14 percent less than in 1933–34; similarly, steel-ingot production was 74 percent above that of 1932–33 and 16 percent below that of 1933–34. It should be noted, however, that since a considerable stocking of raw steel occurred in the latter part of the fiscal year 1934, it would be incorrect to assume that there was an actual decline in the consumption of steel. The trend of production in many steel-consuming industries was generally upward during the year.

Other important manufacturing industries showing declines included the cotton textile and shoe industries. The former industry experienced another difficult year. Improvement in the silk industry was minor, but the further gain in rayon deliveries established a record for this industry.

Among the outstanding increases in the production series were those recorded for consumers' durable goods. Automobile production was up one-fourth; vacuum cleaner sales, 18 percent; electric refrigerator sales, 5 percent; and oil burners for household use, 13 percent. As compared with the low year of the depression, the gains have been much larger—automobile production, for example, was 122 percent above the year 1932–33. For the calendar year 1935, it is expected that production of automobiles will be the largest since 1929, with the output of trucks possibly exceeding the record for that year.

Considerable variation was still evident in the operating rates of the larger industries in 1934–35 in comparison with 1928–29, despite the broadening of the recovery movement. Pig-iron production, for example, was less than 40 percent of the level of the earlier year, while steel production was less than half as much; automobiles less than two-thirds and cotton consumption about three-fourths. On the other hand, some leading industries were able to produce in larger volume than in 1928–29. Among these were the woolen, rayon, leather boot and shoe, electric power, cigarette, and petroleum refining

industries. Production and consumption of commodities in the aggregate were considerably below the 1928–29 level; on a per capita basis the showing was even less favorable, as a result of the increase in population during the past 6 years.

Construction industry improved

Among the favorable developments of the year was the improvement in the construction industry. A resumption of residential building, based on an improved mortgage situation, an upturn in rents, and the general enhancement of economic security, was a feature of the contract statistics of the second half of the fiscal year. However, activity in the construction industry is still low when compared with that of the post-war period, and unemployment in this industry is still of serious proportions.

Residential contracts awarded during the latter months of the fiscal year were at a rate approximately twice that of the preceding year; however, the index at the end of the year was still less than one-third of the 1923–25 average. The value of residential contracts awarded in the 37 States covered by the F. W. Dodge Corporation statistics was 21 percent higher than in the preceding fiscal year, but the total was only 14 percent of the comparable 1928–29 figure. Awards for all types of construction were less than in the preceding year, owing to the decline in the volume of public works contracts from the exceptionally large volume of the earlier period.

The Federal Housing Administration actively pushed its campaign for repairs and renovizing and also its insurance of mortgage loans. The results were reflected not only in a loosening of mortgage funds, but in a downward tendency in financing charges. Government operations, through the Home Owners' Loan Corporation, were responsible for relieving the burden of refinancing mortgages. The volume of the Corporation's loans outstanding at the end of the fiscal year was $2,660,677,012 compared with $1,039,002,540 a year earlier. The reopening of loan applications in May 1935, after the suspension in November of the preceding year, was not met with the flood of applications which featured the first few months of the fiscal year. This was in line with the indications of a turn for the better in the mortgage and real estate field.

Railways still in difficulties

The past year was another difficult period for the railroad industry. While passenger traffic improved with the upward trend of income and with the efforts made by the carriers to stimulate this business through the use of improved equipment and fare reductions, the volume of freight traffic, upon which the main reliance for revenues is placed, failed to expand. The number of cars loaded was slightly less than in the preceding fiscal period and was but 10 percent above the depression low registered in the fiscal year 1933. The Federal Reserve Board's index for the fiscal year was 61.4, on the 1923–25 base, which was 42 percent below the 1928–29 figure. This showing is undoubtedly influenced to some degree by the increased volume of merchandise moved by trucks, but current data on this movement are not available.

Gross revenues of the class I carriers for the year amounted to $3,277,139,000, a decrease of 1 percent from the preceding year.

There was a decline of 1.8 percent in freight revenues which was partially offset by the 2.1-percent gain in passenger revenues. The decline in gross revenues, coupled with an increase in operating costs, reduced the net railway operating income by 22 percent to $428,000,000. This amount was insufficient to meet the fixed charges of the roads, thus contributing further to the deficits piled up during the earlier years of the depression.

The Interstate Commerce Commission, on petition of the carriers, granted a rather broad freight rate incease which went into effect in April. These higher rates, it was estimated, will yield a substantial amount of revenue, and they did aid revenues in the latter part of the year.

Retail trade shows a larger spending income

Retail sales reports for the year reveal the existence of a larger spendable income than in 1933–34, and possibly a disposition to purchase articles more freely on the installment plan in anticipation of future earnings. Consumers' durable goods, which are purchased largely on time payments, have shown some of the widest gains.

Consumer expenditures for the purchase of new passenger automobiles were estimated to have been 31 percent larger last year than in the preceding period and more than double those of 2 years earlier. A large number of the cars purchased have gone into rural areas and such regions have also reported the largest increases in sales of general merchandise. The index of rural sales of general merchandise showed an increase in comparison with 1933–34 and 1932–33 of 18 percent and 54 percent, respectively. The improvement in urban trade, as reflected in the department store sales figures, has been smaller, the gain over 1933–34 being 5.6 percent and over 1932–33, 19 percent.

Employment and pay rolls

Employment conditions improved further during the past fiscal year as the gains of the preceding year were consolidated and extended in some industries which had not felt the original impulse in the early stages of improvement in 1933. Total labor income, including the income of salary and wage earners, was higher than in the year 1933–34, although data are not available to measure the extent of the rise. In the calendar year 1934, the increase was 14 percent in comparison with 1933, but the increase in the fiscal period was probably relatively less since the calendar year comparison had the benefit of the exceptionally low first quarter in 1933.

Factory pay rolls, based on one pay roll reporting period a month, averaged 8.3 percent higher than in the preceding year and were 55 percent above the low year 1932–33. Weekly earnings of factory workers averaged about 6 percent higher than in 1933–34, according to sample data, while hourly rates of pay of factory workers rose above the 1929 average. This trend accompanied a rise of 1.8 percent in the average number employed in factories, a gain resulting from the 5-percent increase in employment in the durable goods industries. For the year, employment in the durable goods industries averaged only two-thirds of the 1929 level as compared with 89 percent for the nondurable goods industries.

Employment in the 16 nonmanufacturing groups, as reported by the Bureau of Labor Statistics, registered changes for the year varying from the gain of 11 percent in metalliferous mining to a loss of 2.9 percent in quarrying and nonmetallic mining. Only three of the groups, however, suffered a decline in employment. Pay-roll changes in these industries varied from a loss of 12 percent in anthracite mining (the only one to show a decline) to a gain of 17 percent in metalliferous mining. Gains of more than 10 percent were made in the pay rolls of the hotel, crude petroleum, and bituminous mining groups.

In comparison with the depression low of 1933, there has been a gain in employment of approximately 4⅓ million persons, nearly half of whom were absorbed by manufacturing industries. Another million was absorbed by trade and agriculture. Unemployment was not reduced to the same extent, by reason of the increase in the employable population. Therefore, a major problem still pressing for further solution is that of unemployment and relief.

Financial developments

In the financial field the principal developments were continuations of trends and movements under way during the previous year, with the exception that during the latter part of the fiscal year there were evidences of a reopening of the capital market. Flotations were mainly for refunding purposes, although there was a larger volume of new capital raised by public issues. The banking system was relatively free from failures for the second successive year.

Bank deposits continued to rise, but the rate of turn-over remained very low. Net demand deposits of reporting member banks in 91 cities increased $2,919.000,000, or 23 percent during the year, largely as a result of heavy gold imports and the enlarged volume of investments, particularly Government bonds, held by banks. The net gold importation of over a billion dollars raised our monetary gold stock to the record high of $9,100,000,000 on June 29, 1935. Total investments of reporting member banks increased $1,396,000,000, or 14 percent, and investments in Government securities increased $742,000,000, or 11 percent. Loans on securities for these banks declined $468,000,000, or 15 percent, while "all other" loans at the end of last year were at practically the same level as a year earlier. These figures reflect the writing off and liquidation of old loans, as well as the failure of a substantial demand for funds on the part of desirable clients.

Despite the increase in legal reserves required for the enlarged volume of bank deposits, member bank reserve balances in excess of legal requirements rose to record heights during the year. The principal factor accounting for the rise in member bank reserves was the heavy gold inflow noted above. The volume of reserve bank credit outstanding remained practically unchanged throughout the year.

The activities of governmental credit agencies designed to strengthen the weak points in the financial structure and to assist in the refinancing of mortgage obligations were continued throughout the fiscal year. The Reconstruction Finance Corporation, the principal lending agency, authorized loans and security purchases to the amount of $1,454,931,638, of which $308,462,217 represented loans

to banks and trust companies (including loans for distribution to depositors of closed banks and loans secured by preferred stock), and $173,399,730 represented purchases of preferred stock, capital notes, and debentures of banks and trust companies. Loans to other financial agencies were authorized to the amount of $72,422,460.

Commercial failures were lower than for the preceding year, and made a very favorable comparison with the figures for a decade and more. The number of failures fell from 14,161 to 11,876, or about 16 percent, while liabilities involved fell from $327,033,000 to $222,737,000, or about 32 percent.

Easy money conditions, resulting from the large volume of idle funds in banks, enabled corporations and governmental units to effect substantial reductions in interest charges through refunding operations. Several corporate issues were refunded at rates below 4 percent, and municipalities were able to secure funds at rates as low as 2 percent. Total domestic capital issues, largely for refunding purposes, amounted to $3,138,000,000. This total was approximately double that of the preceding year, but only about one-third of that for the year ended June 30, 1929 New capital issues amounted to $1,294,000,000, or 27 percent above those of the preceding year, but were only 15 percent of the volume for the fiscal year 1929. Corporate issues made up less than 15 percent of the total. the balance going to States and municipalities (58 percent) and to Government credit agencies.

The gross debt of the Federal Government rose from $27,053,000,000 at the end of June 1934 to $28,701,000,000 at the end of June 1935. The net balance in the general fund at the end of the year was $740,576 701 below the figure for a year earlier. The major portion of the remaining war-time debt was converted into lower interest-bearing obligations, and short-term obligations were issued during the year on terms yielding only a negligible rate of return. The average interest rate on the outstanding interest-bearing debt was reduced from 3.18 to 2.70 percent, with the result that the computed annual interest charge on the national debt was reduced in the face of a rise in the total debt.

General revenues increased about $685,000,000 over last year and general expenditures increased about $621,000,000. Emergency expenditures amounted to $3,654,590,531, resulting in another large deficit. A part of these expenditures represents investments which will be repaid in due course, and in this connection it may be noted that repayments to the Reconstruction Finance Corporation during the fiscal year exceeded the amount disbursed.

Foreign trade gains

Following the expansion in our foreign trade in 1933–34, there was a further increase in the value of exports and imports of 4 percent during the past year. However, in terms of quantity, exports declined 4 percent while imports remained practically unchanged.

Among the more significant changes were the increase in exports of manufactured products and the decline in agricultural exports. On a quantity basis, agricultural exports for the fiscal period were the lowest since 1877. Exports of foodstuffs in 1935 fell below those

of the preceding year, owing partly to price increases. The unit price of crude foodstuffs exported increased a little more than 10 percent. In terms of quantity, exports of crude foodstuffs fell off 28 percent, while the total value of these exports was 20 percent less than last year. Wheat, formerly exported in large quantities, almost disappeared from the export list of the United States in 1935.

Manufactured foodstuffs exported, in unit value, increased approximately 19 percent, but declined 23 percent in quantity and 9 percent in total value. One of the most important groups of this class, packing-house products, decreased approximately 49 percent in quantity and 22 percent in total value.

Foreign trade of the United States

Year ended June 30—	Millions of dollars						Quantitative indexes (1923–25 calendar year average 100)	
	Exports		General imports	Excess of exports (+) or imports (−)				
	Total	U. S. merchandise		Merchandise	Gold	Silver	Exports	Imports
1929	5,373	5,284	4,292	+1,082	−155	+17	[1] 136	[1] 125
1930	4,694	4,618	3,849	+845	−223	+18	121	121
1931	3,983	3,932	2,432	+651	−297	+5	98	101
1932	1,948	1,908	1,730	+218	+714	−5	80	91
1933	1,440	1,413	1,168	+272	−264	−27	65	76
1934	2,042	2,008	1,721	+320	−576	−29	75	91
1935	2,121	2,085	1,786	+335	−1,039	−153	72	92
Percentage change:								
1935 from 1934	+3.9	+3.8	+3.8				−4.0	+1.1
1935 from 1933	+47.3	+47.6	+52.9				+10.8	+21.1

[1] Estimated by fiscal year, for calendar year indexes see Statistical Abstract of the United States.

Exports of crude materials, many of which were agricultural products, fell off sharply in 1935. The unit value of products of the crude-materials class increased approximately 18 percent. Exports of this class declined 24 percent in quantity and 11 percent in total value. Exports of raw cotton were approximately 37 percent less in quantity and 25 percent less in total value. Exports of unmanufactured tobacco declined 21 percent in quantity, but increased 21 percent in value.

Semimanufactures and finished manufactures were little changed in unit value, but increased substantially in quantity and total value. The increase in quantity for semimanufactures was 12 percent and for finished manufactures 18 percent. Although the increase in exports of finished manufactures was fairly evenly distributed among the products of this class, the increase in the exports of some commodities was particularly large. The exports of passenger automobiles and motor trucks, for instance, increased approximately 37 percent in quantity and 40 percent in value.

The domestic shortage and the increased prices of certain foodstuffs were reflected in the imports in 1935. Imported crude foodstuffs increased 9 percent in unit value and 17 percent in quantity. Manu-

factured foodstuffs increased 12 percent in unit value and 16 percent in terms of quantity. The total value of foodstuffs imported, crude and manufactured, increased 27 percent.

Imports of finished manufactures increased 4 percent in quantity and only a negligible amount in value. Imports of both crude materials and semimanufactures declined moderately in quantity and value.

During 1935, foreign nations generally did not relax the restraints which have tended to stifle international trade in the past few years. This has been responsible to a degree for some shifts that have occurred in our trade. Although Europe continued, by a wide margin, to take a larger proportion of our exports than any other geographic area, exports to Europe declined 11 percent in the fiscal year 1935, compared with 1934. The largest percentage increase in our exports occurred in the trade with Oceania and Africa. In absolute amounts greater increases occurred in exports to Latin America, Canada, and Asia. Imports from Europe, Asia, and Africa were less than a year ago, while those from Latin America and Canada increased substantially.

RECIPROCAL TRADE AGREEMENTS PROGRAM

Negotiations in connection with the Reciprocal Trade Agreements program, authorized in June 1934, as a major effort to revive American foreign trade, have necessitated a considerable extension of activities in the Department of Commerce through the Bureau of Foreign and Domestic Commerce.

Prospective negotiations for trade agreements, looking to the reciprocal reduction of tariffs and the removal of other trade barriers now unduly restricting the sale of each country's products in the market of the other, have thus far been announced with 18 foreign governments. Collectively, the areas involved account for more than 40 percent of American foreign trade. They comprise: Eight countries of Europe (Belgium, Finland, France and colonies, Italy, Netherlands and colonies, Spain, Sweden, and Switzerland); 9 of Latin America (Brazil, Colombia, Cuba, Haiti, and the 5 Central American Republics); and Canada. In addition to these the Bureau of Foreign and Domestic Commerce has been called upon to make preliminary studies of the trade relations with several other countries that are being considered for possible negotiation.

Thus far six Reciprocal Trade Agreements in this series have been concluded by the United States—Cuba, Brazil, Belgium, Haiti, Sweden, and Colombia. The first 9 months under the new Cuban-American trade agreement—the only one which has been in operation for a sufficient period to allow a judgment as to results—have witnessed a marked revival of trade in both directions, with gratifying benefits to the producers in each country that have come to depend upon the other's market.

The various studies required by the trade-agreements program naturally constituted a major activity for the Bureau's Division of Foreign Tariffs, second only to its regular services. The Division was called upon for special tariff studies in connection with each one of the countries with which the State Department had announced its

intention to negotiate trade agreements, and a number of preliminary investigations in connection with other countries. In addition, its staff has been called upon for numerous studies of a broad scope required in the general formulation of the trade-agreements program. To supply basic data for these agreements, the Bureau's Division of Regional Information has made extensive statistical and economic studies. The Finance Division of the Bureau prepared the financial sections of the "country studies" which the Bureau made for the use of the interdepartmental committees, and was frequently called upon to furnish financial data to other agencies of the Government. The Division of Foreign Trade Statistics also rendered indispensable service, while every one of the industrial divisions of the Bureau has performed a variety of noteworthy services in furtherance of the Department's efforts to bring the trade-agreements program to a successful consummation.

Also, in connection with the consideration of each trade agreement, the district offices have made available to their respective business communities, the data and information required by firms desiring to submit briefs to or attend hearings before the Committee for Reciprocity Information.

The trade-agreements program of the administration threw a particularly heavy burden on the foreign service of the Bureau. In order to coordinate the preparatory work done by the Bureau and present these data to the interdepartmental committees most effectively the Bureau recalled from the field its commercial attachés to each country listed for reciprocal trade negotiations. These commercial attachés have remained in Washington on this work for a period of from 6 months to more than a year in each case. They have had to coordinate the studies of the various sections of the Bureau, write analyses of our export trade with each foreign country in all commodities of interest, and present this completed material before the interdepartmental committees for final consideration and decision. The ability of the Bureau to bring back from the field specialized men who through their intensive experience in their respective foreign posts hold the confidence of the business community has undoubtedly strengthened the reciprocal trade-agreements program.

FOREIGN AND DOMESTIC COMMERCE

The processes of economic recovery in this country during the past year—with a consequent increase of interest in new commercial endeavors and a greater demand for business data—have been immediately reflected in the faster tempo and the more extended scope of the work performed by the Bureau of Foreign and Domestic Commerce. For example, the number of trade inquiries answered by the Division of Foreign Tariffs showed a growth of 35 percent over the preceding year. The sales-information reports on foreign firms requested from the Commercial Intelligence Division increased 30 percent. The number of inquiries addressed by business men to the Bureau's district offices exceeded by a large percentage the number in recent preceding years. The first print of a world survey of chemical developments in 46 countries, issued by the Bureau at the

close of the fiscal year, was exhausted in 3 days, necessitating a reprint at once. Another indication of the increasing demands upon the Bureau of Foreign and Domestic Commerce is that the number of paid subscriptions to the Bureau's publication entitled "Domestic Commerce" has doubled within the past year. These few examples are indicative of the growth in and utilization of the Bureau's services.

The Bureau has consistently rendered assistance to other agencies of the Federal Government. It has helped the Agricultural Adjustment Administration in connection with processing taxes, problems of market agreements, and such specific questions as the development of so-called "exotics" in the chemical field. It has rendered significant assistance to the Federal Emergency Relief Administration—especially the Divisions of Land Utilization, Subsistence Homesteads, Rehabilitation, and Economic Security. It has supplied information to the Tennessee Valley Authority as to possibilities in electrochemical production. It has frequently been brought into consultation with the Reconstruction Finance Corporation with regard to conditions in different branches of American industry having a bearing on loans to individual firms. It has given the Treasury Department the benefit of its data on dumping, taxes, narcotics, alcohol procurement, and similarly vital matters.

There have been many notable instances, also, of mutual assistance and cooperation between the Bureau, on the one hand, and private commercial and industrial organizations on the other.

Having been assigned the administrative work in connection with the Foreign Trade Zones Act, the Bureau has acquainted citizens and municipalities with the terms and conditions under which such zones will be established, and has also cooperated closely with the Treasury and War Departments in preparing rules and regulations under which they will operate. The Bureau has carried out extensive research as to foreign-trade-zone developments abroad, so that zones in this country may have the advantage of utilizing new and accepted practices.

The Finance Division investigated, more intensively than ever before, a number of vital aspects of the balance of international payments of the United States—phases of the subject on which the need for additional information had been very keenly felt. There was initiated, for example, a census of foreign investments in the United States. Since students of economic trends had expressed the desire for a presentation of balance-of-payments data oftener than once a year, the Bureau prepared and issued a statement covering the first half of the calendar year 1934.

The facilities of the Bureau's Division of Commercial Laws have been employed to the utmost to keep American interests abreast of new legal developments abroad and to make the necessary special studies of current taxation affecting the conduct of American business with or within foreign jurisdictions.

At the request of the Treasury Department, the Bureau took over from collectors of customs the compilation of the monthly report on foreign trade in gold and silver. Weekly reports showing this trade, by country of origin and destination and by customs districts, were initiated.

A study of the long-term debts of individuals, firms, and governmental units in this country has been in progress during the year.

The Bureau's Marketing and Research Division was reorganized in November 1934, being set up with specialized sections which now number 6—Market Data, Wholesale Trade, Retail Trade, Consumer Market, Marketing Service, and Trade Association. The valuable Retail Credit Survey has been expanded to include data for 1934 on 12 trades in 79 cities, instead of 6 trades in 29 cities as in former years. The Retail Trade Section has cooperated with the Federal Housing Administration and 15 universities and colleges in a rather elaborate study of store modernization.

The Specialties-Motion Picture Division has been cooperating with a recently organized group which seeks to develop additional recreational facilities for children in congested areas (expecting to command a fund of several million dollars for this purpose). Though this movement is essentially one for social betterment, its trade-stimulating possibilities have led the Bureau to encourage these activities.

During the year the Bureau's Conferences and Expositions Section has been active in connection with more than 30 conferences, covering a broad field of commercial, educational, and scientific activities, and more than a dozen expositions, several of which were international in character.

AIR COMMERCE

Outstanding among the activities of the Bureau of Air Commerce during the fiscal year 1935 were: Expansion and improvement of the Federal Airways System; strengthening of safety regulations applying to air lines and investigation of accidents; initiation of a series of projects aimed at the development of flying equipment suitable for private owners.

On the Federal airways the Bureau provides lights, intermediate landing fields, and radio directional and communications service. The Federal airways system, comprising 17,315 miles of routes at the beginning of the fiscal year, had been increased to 20,769 miles by June 30, 1935.

Under Public Works Administration allotments, the Bureau had under construction during the year the following routes:

Omaha-Chicago, relocation, 388 miles.
New York-Boston, relocation, 318 miles.
Louisville-Indianapolis, 109 miles.
Galveston-Waco, 212 miles.
Tulsa-St. Louis, 351 miles.
New Orleans-St. Louis, 511 miles.
Fargo-Pembina, 143 miles.
Northern Transcontinental, from Seattle to Twin Cities, 1,504 miles.
Nashville-Washington, 584 miles.

All were in operation at the end of the year, with the exception of the Spokane-Bozeman section of the Northern Transcontinental, and the entire Nashville-Washington airway, which were still under construction.

Besides the foregoing, the Bureau used funds from its regular appropriation and surplus material from warehouses to partially equip airway sections from Boston to Portland, 98 miles, and Boston to Concord, 63 miles, and to begin a similar project on a 106-mile section from St. Petersburg to Orlando in Florida.

Of technical advances on the airways system, an outstanding development of the fiscal year was the progress in radio assistance

for landings. The Bureau's instrument approach system was adapted from the Army Air Corps blind landing system. After thorough tests, the system was found to be practicable, and, on June 30, equipment was being installed for regular service at two airports, Washington-Hoover Airport, Washington, D. C., and Newark Airport, Newark, N. J. Arrangements were being made for additional installations.

Simultaneous transmission on the same frequency channel of radio directional signals and voice was further developed during the year and a station placed in operation for practical service trials at Pittsburgh, Pa.

In regulation of air commerce, the Bureau placed in effect a revised set of air line regulations requiring, among other things, multi-engine aircraft for all night flights and for all flying over difficult terrain; operations manuals covering specific methods of operation for divisions of air line systems, these manuals to be approved by the Bureau of Air Commerce; multi-engine aircraft, two-way radio equipment, and an approved operating procedure for instrument flying in or above clouds.

A proposed draft of Special Requirements for Air Line Aircraft, covering structural requirements, equipment, operation and maintenance and performance tests was sent to aircraft manufacturers and air line operators for comments and suggestions. These would apply in addition to the general airworthiness requirements governing construction of all licensed aircraft, a revised edition of which was issued with October 1 as the effective date. Completely rewritten in the new edition, the airworthiness requirements for aircraft have been brought into line with the many advances which have been made in aerodynamic research and in design practices and procedures since the publication of the previous edition.

A new procedure for investigating and reporting on accidents in civil aeronautics, made possible by the wider powers granted under an amendment to the Air Commerce Act, was put into effect. Two important powers given to the Bureau by this amendment are the authority to conduct public hearings on accidents, and authority to issue public statements on causes of individual accidents, with a provision of law prohibiting the use of these statements, or of the reports of investigations and hearings, in any suits or actions growing out of the accidents.

The Bureau's development program during the period covered by this report was concentrated on a program fostering the design, construction, and development of safer, easier-operated, more comfortable, and lower priced airplanes for private owners. Contracts were awarded for construction of five new types of airplanes with various features designed to bring about improvements along the lines indicated. Other contracts are for two conventional airplanes powered with automobile engines, a test of a belt drive proposed for use instead of gears in connection with automobile-engine-powered airplanes, an aviation engine of a new type, and a steel propeller. Experiments have been conducted also on cooling of in-line air-cooled engines.

Many new sectional aeronautical charts, for use in air navigation, were issued during the year as a result of the expanded program

made possible by a Public Works allotment. The charts are compiled and printed for the Bureau by the Coast and Geodetic Survey.

LIGHTHOUSE SERVICE

The retirement of George R. Putnam, Commissioner of Lighthouses, on May 31, brought to a close a career which was notable for the advances along administrative and technical lines that were accomplished over the long period while he was in charge of this important technical service. Mr. Putnam had served continuously as chief of the Lighthouse Service for a period of 25 years. The office of Commissioner of Lighthouses has since been filled by the appointment of H. D. King, formerly Deputy Commissioner, and for a number of years superintendent of important lighthouse districts along the Atlantic coast.

The introduction of modern mechanical devices and equipment has been the normal result of the development of such equipment to a point where reliability was assured. This transformation has been most marked during the past 2 or 3 years. This mechanization has brought about a constant improvement in the effectiveness of the aids to navigation. Growth of the Service has been facilitated thereby, while the costs of operation have been kept at a minimum, and there has been a gradual reduction of operating personnel.

Through the medium of funds made available by the Public Works Administration, which have totaled slightly over $5,600,000, the Lighthouse Service has been enabled to carry out many important plans for the improvement of its system of navigational aids over the past 2 years. Included among these were the erection of 10 major light stations, the overhaul of 6 lightships, the improving of housing conditions at 10 light stations, and the purchase of new fog signal and radiobeacon equipment for a number of light stations. The plant, by means of which the Service operates, has also been improved by means of funds from this same source. Five new lighthouse depots have been provided and substantial improvements made at 10 others, 2 new district office buildings have been constructed, 3 new lighthouse tenders have been built, and 16 other tenders extensively overhauled. This construction program, which is now nearing completion, has been effective in the relief of unemployment, as well as in bringing about economies in the operation of the Lighthouse Service.

A system of flashing lights for buoys, to indicate their purpose, has been developed and tried out experimentally, and probably will be put into effect in all lighthouse districts by the close of the present calendar year. By means of definite flash characteristics, mariners will be apprised of such salient points as junctions, turns between successive reaches of narrow but important channels, wrecks, and other isolated dangers. This is expected to prove a valuable addition to the present system under which number, color, and shape, have a definite significance, which characteristics are often not readily recognizable at night.

Outstanding among the improvements of the past year is the provision of radio control for an important lightship upon the Great Lakes. This ship is now operated entirely without crew, its mast-

head light and auxiliary fog bell functioning entirely automatically, while the radiobeacon and principal fog signal are controlled by radio from a shore station 8 miles away.

Another improvement in the field of radio has been the establishment of an auxiliary warning radiobeacon of short range aboard Nantucket Shoals Lightship, supplementing the regular station radiobeacon. A new lightship for this station is now under construction, to replace *No. 117*, sunk by collision in May 1934. This vessel will embody all the latest improvements in lightship equipment.

At the close of the fiscal year there were in operation 24,459 aids to marine navigation, this being a net increase of 862 over the previous year. There were 1,013 aids discontinued during the year as being no longer necessary or as having been replaced by more effective aids.

ENFORCING NAVIGATION AND STEAMBOAT INSPECTION LAWS

The work of the Bureau of Navigation and Steamboat Inspection is a considerable factor in the ceaseless effort to make ships more seaworthy and their crews more efficient.

Since the series of disasters to American shipping that have occurred during the past year or so, the Bureau has formulated various activities designed to prevent the recurrence of marine casualties to as great a degree as possible. Among these activities are the following:

A small force of the personnel has been engaged since last February in investigating the construction of American vessels with reference to stability. In the case of the stranding of the S. S. *Dixie*, these studies were of great practical assistance in the salvaging of the vessel. This is the first time that any maritime Government has undertaken such work.

The Fifty-Second Supplement to General Rules and Regulations was published on June 18, 1935, by the Board of Supervising Inspectors. The amendments included in this supplement embrace rules governing tests and inspection of boilers and equipment, bulkheads, lifeboats and equipment, various buoyant lifesaving apparatus, fire apparatus and fire alarms, steering gear, and other items tending toward the added safety of ships.

The regulations covering licensed officers and crews have been considerably strengthened and rules for the holding of lifeboat and fire-station drills have been promulgated with a view to making ships' personnel efficient and disciplined in times of emergency.

The work of the Bureau's patrol fleet is being extended rapidly, inspections greatly increased, and at the same time a friendly cooperation with the small motor-boat operator is being built up, all to the end that the operators of this class of boats may be educated in safety matters. This will tend to reduce the large number of annual accidents and explosions which occur on such craft.

A new system for the collection of data on marine casualties and violations of the navigation laws from the field has been set up after much study of the Interstate Commerce Commission's casualty reports. This system will make possible a detailed analysis of these casualties with a view to their reduction.

The Coastwise Loadline Act provides that the Secretary of Commerce shall make differentials for different types of vessels and the

trades in which they are engaged, in conjunction with the mandatory direction that no loadline shall be above the line of safety.

The act further makes it possible to require that passenger ships shall have a greater margin of safety than would be necessary in the ordinary cargo carrier.

The Fifty-First Supplement to General Rules and Regulations, known as the "Boiler Code", was published on January 1, 1935. These regulations are the result of a great deal of study on the part of experts on the subject both in the Bureau and the various technical societies interested in marine engineering.

SURVEYING AND MAPPING

The work of the Coast and Geodetic Survey for the year is a record of achievement in the vigorous prosecution of nautical and aeronautical chart-making activities, geodetic control surveys, tide and current work, and magnetism and earthquake studies; essentials in the protection of life and property on sea and land as well as important cost-reducing factors in many engineering and industrial enterprises.

These accomplishments, far in excess of those permitted by the Bureau's regular appropriations, were made possible by substantial allotments of public-works funds. The principal considerations which influenced the granting of these funds were that the regular activities of the Bureau could be expanded materially, that such a course would produce valuable results for which there was urgent need, and that the proposed projects were admirably adapted for the relief of unemployment and particularly to provide work for unemployed engineers and men of similar training for whom the problem of relief has been especially difficult.

Many long-delayed hydrographic surveys of coastlines, intracoastal waters, and harbors of the United States and its dependencies, suitable for today's needs, were completed or are nearing completion; the product from the triangulation and leveling parties during the past 12 months was greater than for any like period in the history of the country and exceeds by far any one year's output by any other country in the world: and encouraging strides were also made in cooperation with other agencies in the collection, analysis, and publication of earthquake information, toward the end that buildings, dams, bridges, and other structures may be better built to withstand shocks.

It is especially gratifying to note that the information resulting from these activities, in addition to its normal value, has been of material assistance to a large number of other governmental agencies engaged in recovery measures.

The services rendered by the emergency personnel employed on this work, some 2,300 in number, were of a high order, making it possible to carry on all activities with the economy and efficiency which characterize the Bureau's regular operations. Every effort was made to provide employment in cases where it was most needed, and the improvement in morale of these emergency employees, many without previous work for long periods, arising from their knowledge that they were engaged on useful work for which their education and experience were of real value, was most heartening.

There is one phase of this matter which is causing some concern, arising from the fact that it was desirable to continue field activities and employment thereon as long as possible. As a result, upon the

termination of this work there remained a very large accumulation of field data which should be office-processed without delay in order to make the results available for use and thereby to obtain the full benefit of our expenditures for these operations. The volume of this material is so great that it cannot be handled expeditiously by the small permanent office force of the Bureau. It is hoped that means will be provided to meet this situation.

In reviewing the work of the Bureau for the year, aside from its emergency operations, it is gratifying to note the favorable results of its efforts for internal improvement through the development of new or improved methods and equipment as well as the growth of its cooperative relations with other agencies which undoubtedly is of material benefit to all concerned.

FISHERIES

Conditions in the fishery industry have been far from encouraging during the past fiscal year, as indicated by partial statistics on various branches of the industry. In some cases prices received by fishermen have dropped. As a consequence, while some fishermen have expended a greater fishing effort and have landed larger catches, their incomes from fishing have shown little improvement. This decline in prices is in direct contrast to the rise in the prices of other food products.

Another alarming condition is the apparent decline of certain popular species. In one instance intensive commercial fishing has so depleted the supply of haddock that our fishermen are forced to fish on the banks off Nova Scotia, some 600 miles from our ports. Formerly this fish was abundant on the banks directly off Cape Cod. It is believed that the strain on these fisheries, which are showing depletion, may be eased by educating the housewife as to the food value of many lesser known species which can be taken in larger quantities. In this connection an exceedingly popular pamphlet entitled " Practical Fish Cookery " was compiled from recipes developed in the Bureau's laboratories. It gives methods for cooking practically every variety of fish and shellfish taken in our commercial fishery harvest, as well as suggestions for the economical purchase of fishery foods.

One of the bright spots of the year was the increased cooperation with the States, particularly in fish-cultural work. This has brought about a much higher degree of efficiency than has ever existed before. Not only has it allowed more economy in operation for both the Federal Government and the States, but it has brought about an actual increase in production of the more popular game fishes.

During the year with funds provided by Public Works 16 field parties have been making surveys of the streams of the national forests and parks with a view to providing an inventory of the conditions in these streams affecting fish life. This aids in determining what species of fish are best adapted to these waters and the number that can be supported to the best advantage. One-sixth of the waters of the national forests have been surveyed. The survey has shown that some streams formerly stocked are incapable of supporting the species planted and others, formerly neglected, are suitable.

Extensive investigations to provide for the control or eradication of oyster pests was started late in the fiscal year. The pests being studied are the starfish in the North Atlantic section, the drill in

the Middle Atlantic, and the wafer, or the leech, in the South Atlantic and Gulf.

The technological investigations of the Bureau have been concerned with the utilization of the waste products of the fisheries, home canning of fishery products, the nutritive value of fish, and the handling and care of the harvest to maintain quality. For example, studies on salmon cannery wastes have demonstrated that high quality, vitamin-active, edible oils can be recovered from this material. Commercial application already has been made of this work, and products formerly wasted in the salmon canning industry are now finding a market.

During the 1935 season just ended the take of fur sealskins at the Pribilof Islands was 57,296, the largest number in 46 years. The herd of seals has increased from 130,000 animals to 1,500,000 in the last 25 years. The annual rate of increase is about 8 percent, and it is expected that it will be possible to increase the herd by another million.

NATIONAL STANDARDS

The purchasing of Government supplies on the basis of specifications with free competitive bidding is now well recognized as necessary and advantageous. To insure the success of this procedure, two principles must be rigorously observed: (1) Adequate specifications must be developed setting forth clearly the desired properties of the commodity, and these properties must be capable of quantitative measurement; (2) the delivered supplies must be tested to determine whether they meet the requirements of the specification.

In carrying out both of these activities for other Government agencies the National Bureau of Standards is performing an important and extensive service. Through the cooperation of technical men from all branches of the Government, including a large number from the Bureau's staff, nearly 1,000 specifications have been prepared under the supervision of the Federal Specifications Executive Committee, of which the Director of the Bureau is chairman. This committee reports directly to the Procurement Division. It is essential that these specifications shall provide supplies which are satisfactory in service, and to this end they are frequently revised and strengthened in the light of information gained in the laboratories of the Bureau and other Government agencies.

The testing of supplies to determine whether they meet requirements is an equally important service. In this work the testing facilities of the National Bureau of Standards are being utilized more and more each year by other Government agencies. The testing of 4,400,000 barrels of cement during the year for use in numerous construction projects of the Government and of approximately 110,000 clinical thermometers, largely for the United States Veterans' Bureau, are examples.

When a Government order for 15,000 pounds of white lead for paint is found to contain no lead at all, and another order for 5,000 pounds of zinc oxide contains no zinc oxide, the necessity of testing is vividly realized. No matter how excellent the purchase specification may be, it is fruitless unless its requirements are established by adequate tests.

The demand upon the Bureau for technical information has increased so rapidly in recent years as to necessitate its recognition as an important service function to Government agencies, State and municipal officials, industrial firms, and citizens the country over, who look to the Bureau as a source of up-to-date information on technical matters within its field. In cases of special importance where the necessary information is not available, a laboratory study is made, such as the recent investigation carried out at the request of the cities of Dallas and Fort Worth, to determine whether the dilution of west Texas natural gas before delivery is necessary for its use in domestic burners.

The testing and information service of the Bureau, the development of safety codes and building codes, the establishment of trade standards and specifications all must rest for their success upon a firm foundation of fact. These facts often can only be established by laboratory measurements. Research thus becomes a vitally important part of the Bureau's work, not only in these features, but in the basic functions involved in the development and maintenance of the Nation's standards of weights and measures. Its encouragement and support are not only essential for the development of new and better ways of doing useful things, but it constitutes in fact the very foundation of further advancement.

CENSUS

The principal inquiry undertaken by the Bureau during the past fiscal year was the quinquennial census of agriculture. Not only are the data from this census of special interest in that they show the major changes which have occurred in agriculture during the past 5 years, but the census itself represents a distinct improvement in the speed and completeness of enumeration, and in the expeditious handling of schedules in the office, resulting in the prompt release of primary tabulations. The first tabulation showing the number of farms, total acreage and total values by counties for the United States was released in less than 7 months from the first regular enumeration on January 2, 1935.

The completion of the Census of American Business and of the biennial Census of Manufactures, both for the calendar year 1933, and the improvement of a number of monthly and quarterly industrial reports, are evidence of the efforts of this Bureau to meet the increasing demands for accurate, complete, and up-to-date statistics in the field of trade and industry. Active cooperation with the National Recovery Administration in an effort to expand current industrial reporting also characterized this year's activities in this field. Several special surveys of business and industrial establishments were conducted for other Federal agencies, and for trade associations.

Applications have been made to the Works Progress Administration for allotments to enable the Bureau to undertake: (1) A complete Census of Business for the calendar year 1935, including several groups of concerns and services omitted in the 1933 inquiry; (2) a survey of retail trade in selected areas, to determine more accurately the trend of retail distributions and supplement current information on chain stores and large independent concerns; (3) an indexing of

the individual population returns of the census of 1900, to make readily available accurate age information on applicants for old age pensions, to facilitate the operation of the Social Security Act; and (4) a general census of Population, Occupations, and Youth, to satisfy one of the greatest needs of this country—accurate, up-to-date information on the location of our population, and of their occupational characteristics. Each of these projects, if approved, will yield data of great value to the national administration and to the numerous nongovernmental groups which depend on the Bureau of the Census for reliable information.

Attention is called to the reorganization of this Bureau in line with the increasing demands upon it. Two new divisions have been created—the Division of Religious Statistics, General Information, and Records, and the Division of Territorial, Insular, and Foreign Statistics. The functions of other divisions have been thoroughly examined with the aid of the Central Statistical Board, the Advisory Committee to the Director of the Census, and the Municipal Finance Officers' Association. Typical of the changes which have taken place in the reorganization of personnel, functions, and policies of the Bureau are: (*a*) Trained medical statisticians have been added to the staff in charge of Vital Statistics; (*b*) a policy of allocating births and deaths by place of residence of the person involved rather than by place of occurrence of the death or birth has been adopted; (*c*) thorough training courses for office and field personnel were conducted in connection with the Agricultural Census; (*d*) a general recreational and welfare program for both permanent and temporary employees has been instituted.

Special study is now being given to the Bureau's problem of a severely fluctuating work load and its serious effects on personnel and general administration.

PATENTS

Increase in all but one of the principal activities of the Patent Office, which for a hundred years has an accurate reflex of economic and industrial conditions, may safely be taken as betokening a general improvement in business. A greater number of applications was filed in 1935 than in the previous 12 months; the volume of correspondence was larger; more printed copies of patents were sold; more deeds of assignments were recorded; there were more demands for certified copies and photostats. Only the receipts of final fees showed a decline.

A grand total of 81,248 applications was filed in 1934–35, compared with 79,690 in the preceding year, a gain of 1,558, or 2 percent.

For the second year in succession the Patent Office operated within its income. Receipts from all sources were $4,264,874.67. Expenditures were $4,153,591.21. The surplus of receipts over expenditures was therefore $111,283.46.

From 1923 to 1933, both inclusive, the expenditures of the Office exceeded receipts by amounts ranging annually from $85,535 to $827,342.

Concurrently with an increase in the number of applications received in the Office, there was a gain in the disposition of pending cases. In fact, the work of the Office has been brought more nearly

to date than it has been for many years. The work of all the clerical divisions is current; that of the Design Division is within 30 days; that is, virtually current. Seventeen of the 65 examining divisions in charge of mechanical patents are within 2 months of current; 56 are within 3 months, and all are within 4 months.

In the course of the year the number of applications awaiting actions was reduced from 39,226 to 31,920, or by 18.6 percent. There was final disposition of 64,599 applications, either by their issuance as patents or through their abandonment. Pending applications at the close of the year were 6,241 fewer than on June 30, 1934.

Notwithstanding lack of appropriations for the purpose, classification of patents was undertaken during the year and has progressed measurably even in default of adequate space and personnel. Fourteen examiners and 25 clerks are engaged in this work, which will undoubtedly prove helpful to the Office and to industry.

Since the last previous report of this Office changes in the Rules of Practice have been made with the view to simplifying the procedure and shortening the interval between the declaration of an interference and its final determination. Other significant changes designed to expedite the prosecution of cases have also been adopted.

This improvement in the Rules of Practice is in large part to be credited to the long and painstaking labors of the Patent Office Advisory Committee appointed by the Secretary of Commerce in July 1933. This Committee's membership has been increased from 8 to 15.

Some 270 junior examiners who had served from 3 to 6 years have been promoted from grade P–1 to grade P–2, with additional compensation. This recognition of their just claims will, it is believed, assure better morale and higher efficiency in the examining corps.

Since the several divisions have become more nearly current in their work the need for advancing the examination of applications has grown less imperative, but the Office nevertheless has continued its practice of expediting the prosecution of an application upon a showing that the issuance of a patent would result in immediate investment of idle capital and in the employment of labor.

The revisions of the International Convention for the Protection of Industrial Property made in London in 1934 have been ratified by the United States Senate. Additional nations must yet approve it.

MERCHANT MARINE

During the fiscal year 1935 the Shipping Board Bureau has continued the administration of the functions created by the various shipping acts with respect to the development of the American merchant marine. Of particular importance has been the Bureau's activities under the regulatory provisions of these laws. Numerous important proceedings were conducted, two of which deserve special mention. One related to the unfair methods and practices found to be employed by certain foreign-flag carriers to the detriment of American overseas shipping and commerce, and the other related to the practices and charges of common carriers in the United States intercoastal trade. Orders have been issued which it is expected will go far to stabilize rate structures and require fair and reasonable practices in both the domestic trade and the foreign trade.

The new financial policy has materially assisted in the amortization of overdue accounts and has strengthened the financial position of many steamship companies. Obviously the improved status of these accounts will simplify the adjustment or modification of existing Government aids to shipping.

Investigations conducted by a special committee of the Senate, the Postmaster General, and the Interdepartmental Committee on Shipping Policy, disclosed that abuses had developed in the administration of the existing system of providing Government aid to shipping. The President on March 4, 1935, addressed a special message to Congress in which the undesirable practices under the mail contract system were condemned and recommendation made for the enactment of new legislation to provide a system of direct aids based upon the actual requirements of the industry. Bills were introduced in both Houses of Congress on April 15, 1935. The Department cooperated with the Commerce Committee of the Senate and the Committee on Merchant Marine and Fisheries of the House of Representatives in these studies of the requirements of the American merchant marine, and in anticipation of new legislation made preparation for the administration of the new system of Government aid by the agencies which will be charged with the development of the merchant marine. In pursuance of the injunction of the President, no additional loans were made from the construction loan fund but large collections have been made on account of prior loans and preliminary applications have been examined with a view to expediting new construction when Congress determines the policy to be followed.

The Department has continued the declared policy of liquidating the Government-owned shipping properties. A thorough survey was made of the 229 vessels, comprising the Government-owned fleet of vessels which are held in reserve in lay-up, and the survey committee and a board of survey appointed by the Board of Trustees of the Merchant Fleet Corporation, classified the vessels as follows:

Class I: A first reserve for restricted operation, charter, or sale.
Class II: A second reserve for national emergencies.
Class III: Vessels of insufficient value for commercial or military operation to warrant further preservation.

During the fiscal year there were five remaining Government-owned steamship lines being operated in foreign commerce. With a view to effecting a more efficient and economical operation a consolidation of three of the lines was approved. These lines served North Atlantic ports and United Kingdom and continental European ports. It is proposed that by the consolidation under one managing operator it will be possible to serve economically and satisfactorily all ports with fewer vessels and at the same time reduce administrative and operating expenses. It is expected that this consolidation will become effective during the early part of the fiscal year 1936.

The Bureau has continued the administration of the terminal properties at Boston, Brooklyn, Hoboken, Philadelphia, Norfolk, and Charleston, which are owned by the Government and leased through the Merchant Fleet Corporation. The properties have been kept in a good state of repair.

During the fiscal year 1935 American overseas shipping registered some improvement, in general warranting the hope that if conditions in foreign countries improve, substantial gains may be expected in

the future. The stability of foreign exchange and improved purchasing power both abroad and at home will stimulate exports and imports which will inure to the benefit of the American merchant marine.

With an improved business outlook for American shipowners there is one outstanding concern. That is the continuing obsolescence of the vessels of the American merchant marine. There is an urgent and immediate necessity for the replacement of vessels of our merchant marine, many of which were constructed during World War days and are reaching the condition where they can no longer compete with new and modern tonnage of their foreign competitors. The speed and design of our cargo vessels must be improved in order to maintain the American flag on what are considered the essential trade routes to adequately serve the United States foreign commerce. There must also be constructed additional vessels of the cargo-liner type to maintain our position in the highly competitive trade routes.

FOREIGN-TRADE ZONES

On June 29, 1935, the Foreign Trade Zones Board, created by act of Congress, June 18, 1934 (48 Stat. 998, 1001), formally approved and promulgated the regulations and rules of procedure for the establishment, operation, maintenance, and administration of foreign-trade zones in ports of entry of the United States. These zones are designed primarily to aid our transshipment and reexport trade.

Previous to the issuance of the regulations, the Board published an informational bulletin containing an explanation of the law and the requirements and conditions incident to the proper filing of applications for grants to operate foreign-trade zones. The Board, as established by the legislation, consists of the Secretary of Commerce, chairman; the Secretary of the Treasury, and the Secretary of War.

The regulations provide for a committee of alternates which will act for the Cabinet officers named on the Board in the preliminary investigations attendant upon the establishment of such zones and also in the supervision of any zones that are authorized. The Director of the Bureau of Foreign and Domestic Commerce will act as alternate for the Secretary of Commerce.

An examiners' committee, consisting of a representative of the Department of Commerce, the collector of the port, and the Army engineer of the district in which the proposed area is to be located, will conduct the investigation incident to the establishment of a zone.

The regulations contain a detailed list of exhibits which are required to accompany formal applications. The data submitted by the applicant will be carefully studied, not only for the Board, but also to advise communities and individuals of the responsibilities that they will be required to assume, and to assist them in appraising the benefits.

Since the issuance on June 29, 1935, of Board regulations governing the establishment, operation, maintenance, and administration in the United States of foreign-trade zones, an application for a grant to establish a zone on Staten Island has been filed with the Foreign Trade Zones Board by the mayor of New York and is now under consideration.

A number of other municipalities and localities have informed the Board that they are now engaged in studying the question of the establishment of a foreign-trade zone in their respective ports of entry with a view to filing applications for grants. It is possible that these studies will result in the filing, in the near future, of additional applications.

BUSINESS ADVISORY COUNCIL

In order to better meet the provisions of the enabling act of the Congress which authorized the Department of Commerce "to foster, promote, and develop foreign and domestic commerce", a Business Advisory Council, composed of representative business leaders, was organized in June 1933, to make available to the Department of Commerce seasoned judgment and experience on matters affecting the relation of the Department and business.

The council addressed itself particularly to these questions: First, how the facilities and activities of the Department could be organized and directed to serve business most effectively; and second, to study and report on specific problems of economic and business importance looking forward to safe and needed planning under the facilities of the Department for a long-term business promotional program.

The recommendations of the council committees specifically concerned with the activities of the Department of Commerce have been of valuable assistance in the conduct of the Department's affairs throughout the year. Important phases of the departmental program have come up before these groups for review and suggestions. The Department has had the benefit of business men's advice on questions involving its services to business. Before the initiation of new services or changes in the existing program have been effected, counsel and advice was secured from this advisory group of representative business men, thus providing business with a direct voice in the affairs of the Federal department representing it.

It is the desire of the Department of Commerce to further cooperation between Government and business to the fullest extent. It is felt that the culmination and highest point in this endeavor is to be found in the work of the committees of the Business Advisory Council and of the council as a whole with reference to Federal activities affecting trade and industry. A score of small organized groups within the council have devoted their attention during the past year, and are at this time continuing their efforts, to the presentation, through the proper channels, of the "business man's point of view" on subjects of current significance. In this manner the careful judgment and practical experience of industrial leaders are made available to the Government.

Since many council members are also members of other Federal advisory groups, the council has developed into a body of business representatives, a clearing house and a center of coordination for industrial views on governmental matters which affect business. For this result both business and the administration may be gratified. From its past record, the Department is confident of the continued invaluable assistance of the council.

In view of the remarkably hearty cooperation of these business men, their participation in these important conferences at the De-

partment at a time when undoubtedly their own affairs must require the closest attention, and as they defray their own expenses and the Government has not reimbursed them in any respect, I believe that the names of the members of the council should be recorded in this report.

GENERAL COUNCIL MEMBERS

Charles A. Cannon, Kannapolis, N. C.
David R. Coker, Hartsville, S. C.
Karl T. Compton, Cambridge, Mass.
F. B. Davis, Jr., New York City
Henry S. Dennison, Framingham, Mass.
R. R. Deupree, Cincinnati, Ohio
Ernest G. Draper, New York City
Gano Dunn, New York City
Pierre S. du Pont, Wilmington, Del.
R. G. Elbert, New York City
John H. Fahey, Worcester, Mass.
Lincoln Filene, Boston, Mass.
T. Austin Finch, Thomasville, N. C.
Ralph E. Flanders, Springfield, Vt.
James D. Francis, Huntington, W. Va.
Walter S. Gifford, New York City
A. P. Greensfelder, St. Louis, Mo.
Lew Hahn, New York City
Henry I. Harriman, Boston, Mass.
W. A. Harriman, New York City
Henry H. Heimann, Niles, Mich.
Wetmore Hodges, Santa Barbara, Calif.
William A. Julian, Cincinnati, Ohio
H. P. Kendall, Boston, Mass.
Fred I. Kent, New York City
de Lancey Kountze, New York City
Morris E. Leeds, Philadelphia, Pa.
C. K. Leith, Madison, Wis.
Thomas H. McInnerney, New York City
George H. Mead, Dayton, Ohio
James H. Rand, Jr., New York City
E. T. Stannard, New York City
Robert Douglas Stuart, Chicago, Ill.
Gerard Swope, New York City
Myron C. Taylor, New York City
Walter C. Teagle, New York City
Edmond C. Van Diest, Colorado Springs, Colo.
W. J. Vereen, Moultrie, Ga.
Thomas J. Watson, New York City
Sidney J. Weinberg, New York City
R. E. Wood, Chicago, Ill.
William E. Woodward, New York City

FISHERY ADVISORY COMMITTEE

Another effective channel of cooperation between business and Government has been opened through the organization and appointment of the Fishery Advisory Committee, by the Secretary of Commerce on March 22, 1935.

The primary function of this committee is to advise and counsel the Secretary of Commerce and the Commissioner of Fisheries on the broad problems of the development, promotion, and regulation of the fisheries of the United States and its territories.

In selecting the personnel of the committee it was the endeavor to have represented all segments of the fishery industry as well as related fields of activity. We have been most fortunate in this regard and have secured the services of outstanding fishermen, processors, canners and distributors of fishery products as well as representatives from the fields of science, medicine, refrigeration, and transportation.

The members of the committee serve without remuneration and bear all expense which they incur incidental to attending meetings. In view of the valuable service these people are rendering and the spirit of unselfish service that has been demonstrated by them, I take this opportunity of recording their names. They are as follows:

E. B. McGovern, Seattle, Wash., Chairman.
Gardner Poole, Boston, Mass., Vice-Chairman.
Dr. Henry B. Bigelow, Cambridge, Mass.
Howard W. Beach, New Haven, Conn.
Nick Bez, Seattle, Wash.
A. F. Cleveland, Washington, D. C.
E. H. Cooley, Boston, Mass.
O. G. Dale, New York City.
R. P. Fletcher, Chicago, Ill.
Nelo J. Gonzales, Mobile, Ala.
Mrs. B. F. Langworthy, Washington, D. C.
Capt. A. E. Lathrop, Seattle, Wash.
H. G. Maxson, San Francisco, Calif.
H. A. McGinnis, Philadelphia, Pa.
Capt. Val O'Neil, Boston, Mass.
L. H. Smith, Port Washington, Wis.
Harden F. Taylor, New York City.
Dr. R. V. Truitt, College Park, Md.
J. C. Veatch, Portland, Oreg.
William Weston, M. D., Columbia, S. C.
A. G. Willford, Waterloo, Iowa.

EX-OFFICIO MEMBERS

Senator Royal S. Copeland, New York.
Congressman Schuyler O. Bland, Virginia.
Congressman Ralph O. Brewster, Maine.
Delegate Anthony J. Dimond, Alaska.
Commissioner Frank T. Bell, Bureau of Fisheries, Washington, D. C.

It is estimated that the fishery industry is worth almost a billion dollars in normal times to the industrial structure of the nation; it becomes a matter of serious consideration, therefore, that this industry has not as yet experienced a degree of recovery comparable to that realized by other important economic segments. A major contributing factor to this condition is believed to be the lack of unified action by and cooperation of the various phases of the industry. Thus the Fishery Advisory Committee assumes a position of commanding importance for it marks the first time that virtually all branches of the fisheries are united in action for the welfare of the entire industry.

NEW LEGISLATION RECOMMENDED

A study of the needs of different department units reveals the desirability for certain new legislation. As suggested by the various Bureaus, the Department submits the following for the consideration of the Congress.

Air commerce

The Bureau regards it as highly desirable that it be permitted to purchase equipment for experimental purposes on a negotiated contract basis, and in view of the similarity of work by the Army, the Navy, and Bureau of Air Commerce relative to aeroplane developments, it is believed that the Department of Commerce should be included with the Army and Navy in legislation relative to procurement.

Census

The Census Bureau is considering legislation which is expected to be necessary over an extended period. It recommends the submission to the next session of Congress of a general census bill to accomplish the following objectives: (1) Codify the legislation which has been enacted since the Permanent Census Act of 1902, and provide the legal basis for a unified program of statistical inquiries; (2) coordinate the work of this Bureau to the end that related inquiries are conducted at the same time or for identical periods; (3) provide an increasing amount of data on a quinquennial and on an annual basis, particularly with regard to the activities of trade and industry; and (4) reduce the severely fluctuating work load now imposed upon the Bureau.

More specifically, it is proposed that complete quinquennial inquiries be conducted by the Bureau and be supplemented by annual inquiries (or estimates) of manufactures, mining, wholesale and retail enterprises, communication and transportation, financial statistics of State and local governments, agriculture, and population. Some of these inquiries are now on a biennial basis, others on a quinquennial, and others still decennial. This presents severe administrative problems as well as statistical problems of attaining strict comparability. It has been suggested that the major economic inquiries—the censuses of manufacturers, business, mines, and electrical industries—should be taken concurrently for years ending in 2 and 7; and that the major social inquiries—the census of population, occupations, employment, religious bodies, and agriculture (because

of its close relation to farm population)—be taken for years ending in 0 and 5.

Consideration should be given to the numerous proposals received by the Bureau for the taking of a census of unemployment.

Foreign and Domestic Commerce

The legislation, regarded by this Bureau as desirable, includes the following: (1) The Comptroller General having ruled that the provisions of the Department's appropriation acts, since that of April 29, 1926, make it mandatory for the Secretary to charge for special services (such as lists of buyers, statistical services, commodity news bulletins, and world trade directory reports), the Bureau feels that the wording of the act, under the subtitle "Lists of Foreign Buyers", should be amended so as to permit the Secretary hereafter to make such charges as he in his discretion deems reasonable; (2) from the experience of district officers and representatives in the foreign field, it is felt that a change should be made in new legislation affecting the Bureau, as it may deal with renting regulations, particularly as these affect occupancy in Federal buildings in this country and points abroad where renting periods do not coincide with the United States fiscal year, or where leases must be made for a period of years; (3) that legislation affecting the Bureau be amended so as to include, under the provision of the Hoch Act, appointive American clerks in the list of officers comprising the foreign commerce service, including these in the list of those eligible to receive allowance for quarters, heat, and light, and to modify in certain respects the phraseology of the Hoch Act referring to "continuous" journeys of field officers and permitting allowances for quarters, heat, and light to officers stationed in the Insular Possessions of the United States.

Bureau of Fisheries

New legislation is desirable, it is believed, in connection with fisheries as an industry and the regulation of whaling. A bill before the last session of Congress provided for "economic studies of the fishery industry, market news service, and orderly marketing of fishery products and for other purposes." The Bureau favors the measure. It is also interested in legislation to give effect to the convention between the United States and certain other countries (concluded at Geneva, Mar. 31, 1932) for the regulation of whaling.

Lighthouse Service

Legislation is deemed advisable relative to the marking of wrecks and reimbursement for expenses incurred, and payment for damages to aids to navigation. There should be two minor amendments to the act of May 28, 1935, affecting the disposition of lighthouse reservations.

Coast and Geodetic Survey

There is need for legislation to regulate the distribution and promotion of the field engineers of the survey, a group of 171 commissioned officers who administer the Bureau, direct its field operations, and are responsible for its engineering accomplishments. The purpose would be to make it possible to promote to higher classification after reasonable periods of service, independent of vacancies occurring as a result of retirement or death. At present this is not pos-

sible. A condition of intolerable stagnation inevitably must result from an excessive number of officers in the lower grades and too few in the higher.

Bureau of Navigation and Steamboat Inspection

A number of measures already drafted for congressional consideration are of interest to this Bureau. The measure known as the Bureau's "reorganization" bill (H. R. 8599) is a consolidation of five bills drafted in the Bureau. Its provisions include a suggestion of (1) change of name of the Bureau, (2) reduction in the number of supervising inspectors and reorganization of that service, (3) provision for traveling inspectors and trial boards in case of accident, (4) creation of a bureau technical staff to supervise construction, (5) compensation for overtime services. Another bill which is a consolidation of two bills drafted by the Bureau provides (1) an amendment to the Seamen's Act to permit an examination of seamen and (2) provision for maintaining discipline on shipboard through the issue of "certificates of service" to the crews. Another bill is intended to amend certain provisions of the Revised Statutes so as to extend the provision of the steamboat inspection laws to motor-propelled vessels. Among other legislation favored is a measure now in Congress intended to improve living conditions on small vessels and one providing for an 8-hour day for deck crews. All of these bills have been favorably reported from the House Committee on Merchant Marine and Fisheries and two have passed the House.

Patent Office

A number of bills relating to patent matters were introduced into the Seventy-fourth Congress and are still pending. Of these, six are directed to legislation which, in the opinion of the Commissioner of Patents, is likely to serve the public interest. They are the following:

S. 1794 and S. 1795 designed to effectuate certain provisions of the International Convention for the Protection of Industrial Property as revised at The Hague on November 6, 1925.

H. R. 5805 and H. R. 5806 which embody the same provisions as S. 1794 and S. 1795, respectively.

H. R. 4985 which proposes to amend existing statutes to permit a single signature to a patent application, and also provides that a patent granted to a multiple of applicants is not invalidated if it later develops that the invention is a sole invention.

H. R. 8382, which would make it unlawful for any person not duly registered to practice before the Patent Office to hold himself out or permit himself to be held out as a patent solicitor, agent, or attorney.

Shipping Board Bureau

In the interest of the merchant marine the following legislation is recommended:

(1) Abolition of indirect subsidies and the substitution therefor of direct aids based on building and operating differentials; (2) amendment of the Shipping Act, 1916, so as to provide (*a*) that tramp ships be included in the definition of common carriers; (*b*) that interstate carriers of coastwise traffic be required to file and observe their actual rates; (*c*) that the Department be clothed with

minimum rate power over carriers, and minimum and maximum rate power over other persons subject to the act; (*d*) that false billing by shippers be made a misdemeanor; and (*e*) that specific penalties be provided for violations of the act; (3) repeal of the so-called Allin amendment provisions of the Intercoastal Shipping Act, 1933; (4) changes in the present laws relating to the division of damages in cases of collisions at sea; (5) appropriation of funds for a merchant marine naval reserve; (6) removal of the limitation of $185,000,000 on the amount of construction loans, and the granting of authority for the Department to build up the Construction Loan Fund until the amounts set aside for this purpose out of revenues from sales and operations, plus appropriations by Congress, reach the maximum of $250,000,000 provided by the Merchant Marine Act, 1928; (7) amendment of the coastwise laws substantially as provided in H. R. 112, Seventy-fourth Congress; (8) authority for the Department of Commerce to underwrite war risks in connection with American commerce in time of emergency; and (9) adoption of The Hague rules for the carriage of goods by sea.

In addition to the above, it is recommended that the International Convention for Safety of Life at Sea, signed in London in 1929, be ratified and given full effect at the next session of Congress.

Sincerely yours,

DANIEL C. ROPER,
Secretary of Commerce.

REPORT BY BUREAUS

CHIEF CLERK AND SUPERINTENDENT

Demands on the various divisions of the Office of the Secretary were unusually heavy during the year just closed. The personnel, though limited, responded willingly and enabled us to close the year with all work practically current. Overtime work performed by employees of the Office of the Secretary amounted to 829 days.

SPACE IN COMMERCE BUILDING

The space situation in the Commerce Building is far from satisfactory. The United States Shipping Board Bureau, except for a small portion in the Commerce Building, is housed at 1712 G Street. Approximately 90,200 square feet of space in the Commerce Building is occupied by agencies other than the Department of Commerce. The remaining space is inadequate to our needs and the shifting of units and rearrangement of space is constantly necessary. Such arrangement is far from desirable and the best working conditions cannot be had until the entire Commerce Building is available for Department use.

CALIFORNIA-PACIFIC INTERNATIONAL EXPOSITION, SAN DIEGO, CALIF.

The Congress having authorized Federal representation at this international celebration, the Department of Commerce is participating with exhibits from the Office of the Secretary and all bureaus. Because of the limited space and brief interval between passage of the authorizing legislation and the date of opening, a number of the exhibits from A Century of Progress Exposition were reconditioned and utilized. Included with a miniature of the Department of Commerce building are displays depicting principal features of the services and activities of the 10 bureaus. The Secretary of Commerce who serves as one of the Federal commissioners, was especially designated by the President to extend personally the official greetings and congratulations of the Federal Government to the people of California on the opening day.

DIVISION OF ACCOUNTS

The following table shows the total amount of all appropriations for the various bureaus of the Department for the fiscal year ended June 30, 1935:

Bureau or Office	Annual appropriation acts	Special funds	Pay restoration	To other departments	From National Recovery Administration	Total
Office of the Secretary	$797,410	$25,165.43	$48,794.00	−$64,649.00		$806,720.43
Federal Employment Stabilization Office	40,000					40,000.00
Bureau of Air Commerce	5,205,250		169,231.99		$973,075 20,000	6,367,556.99
Bureau of Foreign and Domestic Commerce	2,164,157		151,494.00	−3,785.92		2,311,865.08
Bureau of the Census	3,863,500		193,400.00			4,056,900.00
Bureau of Navigation and Steamboat Inspection	1,337,752	14,754.43	85,649.00		60,000	1,498,155.43
Bureau of Standards	1,436,908		88,274.09	−8,100.00		1,517,082.09
Bureau of Lighthouses	8,517,373		464,281.00			8,981,654.00
Coast and Geodetic Survey	2,126,061		80,907.00		1,489,800	3,696,768.00
Bureau of Fisheries	1,181,537	20,361.90	25,458.00		1,500	1,228,856.90
Patent Office		5,206,221.08	203,955.87			5,410,176.95
U. S. Shipping Board Bureau	219,216			−1,512.00		217,704.00
Total	26,889,164	5,266,502.84	1,511,444.95	−78,046.92	2,544,375	36,133,439.87

Disbursements during the year ended June 30, 1935, from appropriations and from funds transferred from other departments were as follows:

Bureau or Office	Appropriation for—				
	National Recovery Administration—Commerce	1933	1934	1935	Total
Office of the Secretary		$1.10	$334,391.25	$837,327.56	$1,171,719.91
Bureau of Foreign and Domestic Commerce		1,272.35	72,338.18	2,429,887.37	2,503,497.90
Bureau of the Census	$11,534.55	32.67	61,663.47	5,252,969.75	5,326,200.44
Bureau of Navigation and Steamboat Inspection	70,018.15	2.00	26,558.52	1,440,690.01	1,537,268.68
Patent Office		.43	22,078.64	3,903,574.53	3,925,653.60
Coast and Geodetic Survey	6,112,716.25	982.21	393,263.62	2,724,902.39	9,231,864.47
Bureau of Standards	28,978.88		46,574.34	1,825,488.55	1,901,041.77
Bureau of Lighthouses	3,413,475.20	9,542.95	738,283.29	8,204,523.60	12,365,825.04
Bureau of Fisheries	274,231.33	534.46	84,783.95	1,268,677.27	1,628,227.01
Bureau of Air Commerce	1,735,120.64	2,214.20	413,033.08	4,574,339.72	5,724,707.64
Federal Employment Stabilization Office			219.57	30,296.92	30,516.49
U. S. Shipping Board Bureau			19,496.89	414,261.86	433,758.75
Total	11,641,075.00	14,582.37	2,212,684.80	32,911,939.53	45,780,281.70

MISCELLANEOUS RECEIPTS

Office of the Secretary:	
Copying fees	$95.75
Reimbursement of expenses	69.97
Sale of scrap and salvaged materials	15.00
Sale of stores, condemned	3,583.66
Bureau of Air Commerce:	
Violation, air-traffic regulations	1,840.00
Commissions on telephone pay stations in Federal buildings outside of Washington, D. C	1.77
Copying fees	18.00
Reimbursement, Government property lost or damaged	137.02
Reimbursement for transportation	.21

Bureau of Air Commerce—Continued.	
Sale of—	
Publications	2.80
Scrap and salvaged materials	2,535.95
Stores, condemned	288.51
Stores	.63
All other	88.26
Profits from bus operations, etc	9.75
Rent of public buildings and grounds	65.00
Sale of buildings, exclusive of land	352.75
Sale of equipment	5,123.47
Bureau of Foreign and Domestic Commerce:	
Gain by exchange	.01
Fees under China Trade Act	1,550.00
Reimbursement, Government property lost or damaged	11.26
Sale of—	
Photo duplications	9.01
Publications	22,182.25
All other	1.50
Telephone and telegraph service	31.63
Rent of equipment	30.00
Sale of equipment	1,154.25
Bureau of the Census:	
Copying fees	292.50
Work done	2,791.10
Bureau of Navigation and Steamboat Inspection:	
Reimbursement, Government property lost or damaged	3.50
Sale of—	
Waste paper	3.16
Publications	329.11
Scrap and salvaged materials	646.62
Equipment	296.63
Deposits of unclaimed moneys of individuals whose whereabouts are unknown	10.00
Tonnage tax	1,433,521.86
Tonnage tax, Philippine Islands (decision of Comptroller General, Feb. 6, 1931, A-18469) (trust account)	14,706.42
Fines and penalties	34,735.39
Fees	179,173.25
Bureau of Standards:	
Testing fees	49,842.50
Reimbursement, excess cost over contract price	21.75
Reimbursement of expenses	15.34
Sale of scrap and salvaged materials	95.60
Sale of equipment	.50
Bureau of Lighthouses:	
Fines and penalties, all other	66.39
Commissions on telephone pay stations in Federal buildings outside of Washington	64.36
Copying fees	50.69
Forfeitures, bonds of contractors	105.92
Refund on empty containers	7.00
Reimbursement, excess cost over contract price	6,842.14
Reimbursement of expenses	138.08
Reimbursement, Government property lost or damaged	5,614.06
Reimbursement for transportation	23.38
Sale of—	
Publications	.45
Scrap and salvaged materials	4,787.55
Stores, condemned	2,174.76
Stores	125.20
Telephone and telegraph service	93.48
Work done	3,002.62
Rent of public buildings and grounds	3,042.91
Business concessions	21.65
Permits, fishing and hunting	97.00

Bureau of Lighthouses—Continued.	
Pipe-line water rights	85.00
Sale of—	
Buildings, exclusive of land	259.66
Buildings, Government	151.00
Equipment	13,540.69
Land	3,714.21
Land and buildings	5,399.07
Coast and Geodetic Survey:	
Interest on deferred collections or payments	5.60
Copying fees	762.15
Refund on empty containers	20.00
Reimbursement of expenses	33.20
Reimbursement, Government property lost or damaged	593.68
Sale of—	
Charts	62,372.08
Maps	13,718.39
Publications	7,832.84
Telephone and telegraph service	8.52
Business concessions	2.00
Sale of equipment	2,434.38
Bureau of Fisheries:	
Reimbursement, excess cost over contract price	27.78
Sale of—	
Sealskins	52,159.45
Fox skins	51,872.80
Scrap and salvaged materials	164.89
Stores, condemned	60.75
Subsistence	14.00
Equipment	516.05
Advances, fox- and fur-seal industries, Pribilof Islands (decision of Comptroller General Nov. 16, 1934, A-23895)	40,911.90
Patent Office: Fees, 1935	4,077,883.08
U. S. Shipping Board Bureau: Interest on money loaned from construction loan fund	2,915,931.18
Miscellaneous: Gasoline tax	58.26
Total, Department of Commerce	9,032,473.89

APPOINTMENT DIVISION

At the close of the fiscal year 1935, exclusive of 3,648 persons paid from emergency funds and 1,636 employees in the Bureau of the Census engaged on the work of the Census of Agriculture, the personnel of the Department numbered 14,680 (13,275 permanent and 1,405 temporary). Of that number, 4,189 were employed in the District of Columbia, and 10,491 in the field. The total personnel as of June 30, 1934, was 14,844 (13,086 permanent and 1,758 temporary), of which number 3,997 were employed in the District of Columbia, and 10,847 in the field. The personnel for the fiscal year 1935, therefore, shows a decrease of 164 from 1934, and 3,162 from 1933.

The number of employees retired on annuity during the year under the Civil Service Retirement Act and economy legislation provisions was 65—35 by reason of age, 24 on account of disability, 2 by reason of involuntary separation, and 4 by optional retirement. Under the Lighthouse retirement system, 28 were retired for age and 42 on account of disability. A total of 1,752 civilian employees have been retired under the applicable statutes to the close of June 30, 1935.

DIVISION OF PUBLICATIONS

The following statement gives, for the fiscal years 1934 and 1935, the amounts available to the Department for printing and binding, the amounts expended, and the unused balances.

	Fiscal year—	
	1934	1935
Services other than the Patent Office:		
Amount available	[1] $487,473.85	[2] $349,014.00
Expenditures	450,544.67	[3] 339,045.95
Balance	36,929.18	9,968.05
Patent Office:		
Amount available	950,000.00	900,000.00
Expenditures	940,213.55	[3] 868,980.94
Balance	9,786.45	31,019.06

[1] The amount available during 1934 included an appropriation of $460,000, plus $56,790 transferred from "Salaries and expenses, Bureau of the Census, 1934", and a credit of $127.39 for miscellaneous blank forms furnished to the National Recovery Administration, a total of $516,917.39. From that amount the following sums were deducted: $3,000 transferred to the Civil Service Commission when the issuance of the Official Register was transferred to that organization, $26,377.54 transferred to the Interior Department and $66 transferred to the Treasury Department by reason of the transfer of the Bureau of Mines and the Disbursing Office from the Department of Commerce.

[2] The amount available during 1935 included an appropriation of $350,410, plus $31,296 provided in section 21 (e), act of Mar. 28, 1934, to cover 40-hour week at Government Printing Office, and $4,750 transferred from "General Expenses, Bureau of Lighthouses." From that amount the following sums were deducted: $37,000 transferred to the Interior Department and $442 transferred to the Treasury Department by reason of the transfer of the Bureau of Mines and the Disbursing Office from the Department of Commerce.

[3] Estimated, exact figures for 1935 cannot be given until all work ordered in that year is completed and billed

Receipts from sales of the Department's publications for the fiscal year 1934 (the latest period for which complete data are available) were $543,621.56 compared with $549,726.65 for 1933. The following table presents a comparison for the 2 years by selling agencies:

Sales	Receipts	
	1933	1934
By the Superintendent of Documents: Miscellaneous sales and subscriptions	$170,176.22	$141,537.79
By Coast and Geodetic Survey: Coast pilots, inside route pilots, tide tables, current tables, charts, and airway maps	51,269.48	77,143.47
By Patent Office: Specifications of patents, reissues, etc., trade-mark section and decision leaflet of Official Gazette, and classification bulletins and definitions	328,280.95	324,940.30
Total	549,726.65	543,621.56

DIVISION OF PURCHASES AND SALES

During the fiscal year 1935 there were placed 16,255 purchase orders, which, including freight, travel, rent, and miscellaneous accounts, involved the expenditure of $2,332,693.25. This is a decrease in orders of 118 and in expenditures of $194,111.41, under the fiscal year 1934.

It is estimated that 791 contracts approximating $3,240,781.34 were submitted to this office for examination and forwarding for departmental approval, by the various field offices of the Department.

This is an increase of 251 contracts examined, but a decrease in the amount expended of approximately $273,219. There were also 49 formal contracts amounting to $648,245.22 prepared by this Division, which is 14 more contracts than were prepared last year and an increase of approximately $50,245 in the amount expended.

Through the cooperation of the Treasury Department, Procurement Division, material valued at approximately $7,000 was obtained by transfer, without the exchange of funds, from other Government Departments. The material obtained by transfer consisted mainly of a cabin cruiser, four electric ranges, two microscopes, and a quantity of household furniture for the Bureau of Fisheries; several lathes and motors for the Bureau of Air Commerce; radio and electrical equipment, a gasoline engine, cable, and miscellaneous hardware, as well as desks and an automobile, for the Bureau of Lighthouses; two dynamometers, silverware, dishes, platinum tools, etc., for the National Bureau of Standards; and miscellaneous office equipment for the Bureau of Navigation and Steamboat Inspection.

In connection with the above, surplus material valued at approximately $16,000 was transferred, without the exchange of funds from this Department to other branches of the Government, this material consisting of fuel oil, dories, an automobile truck, batteries, watchhouse sheds and towers, bulletin boards, barometer, the lighthouse tender *Larch*, and a derrick barge.

DEPARTMENT LIBRARY

At the close of the fiscal year the number of books in the Department Library was 215,587, and periodicals and newspapers, 1,799. The number of books cataloged was 6,697; cards added to the catalog, 20,611; number of books circulated, 57,317, an increase of 10.7 percent over last year; books prepared for shelf, 7,486; transfers from Library of Congress, 446; books bound, 827; books borrowed from the Library of Congress and other libraries, 1,875; books loaned to other libraries, 495.

TRAFFIC OFFICE

The traffic office has continued to keep current with changes in rates for both passengers and freight, indicating economies wherever possible and taking advantage of Army and Navy transports and standard and special water routes.

This office has also been of assistance, upon request, to a number of the new organizations in supplying rates, fares, and routes, and indicating transportation rules.

OFFICE OF SOLICITOR

During the fiscal year ended June 30, 1935, there were 684 formal opinions rendered; 700 contracts totaling $3,250,000, together with 76 contracts of indeterminate amounts; 2,005 leases amounting to $178,650; 12 insurance policies amounting to $1,523,650; 65 revocable licenses; 39 deeds amounting to $100,000; 270 contract bonds amounting to $1,902,394; 72 annual bonds and performance bonds; 61 official bonds amounting to $390,000 were examined, approved, disapproved, redrafted, or modified. In addition this office handled 139 legal instruments of the Merchant Fleet Corporation. Eighteen applications for allotments submitted by the various bureaus under the Emergency Relief Appropriation Act for 1935 were examined and approved.

At the beginning of the fiscal year there were 739 cases in litigation involving $66,906,035.70; 65 new cases were added involving $14,366,363.43 and 327 cases closed involving $10,166,902.30, so that at the end of the fiscal year 1935 the total number of cases were reduced to 477 cases involving $71,105.496.83.

The litigation handled involved for the most part cases arising out of the activities of the Fleet Corporation and Shipping Board Bureau although there were other cases handled for other departments of the Government. There were 369 Fleet Corporation cases pending on June 30, 1935, involving $66,979,832.03, and on the same date there were 58 cases involving $3,262,678.16 handled for other departments of the Government. There were also 50 cases totaling $862,986.64 involving outside protective and indemnity underwriters which this office exercised supervision over. All litigation was handled under the supervision and control of the Department of Justice, but active assistance was rendered by this office. In many instances the cases were prepared and tried by attorneys attached to this office. Briefs and other pleadings were prepared and other details likewise handled.

There were many miscellaneous matters embracing all phases of administrative law and procedure handled. This office was frequently called upon to confer with representatives of the various bureaus and render informal advice for the guidance of these bureaus. In this connection many oral and informal opinions were rendered.

Legislative matters were handled which included the drafting and redrafting of bills and preparation of reports thereon.

BUREAU OF AIR COMMERCE

Promotion and regulation of air commerce, and the establishment and operation of aids to air navigation, are the functions of the Bureau of Air Commerce. Its activities during the fiscal year 1935 were in discharge of these responsibilities, with safety of flight as the fundamental consideration.

The Federal Airways System was increased during the year from 17,315 to 20,769 miles, and various developments took place in operation of the air navigation aids on this system which are discussed hereafter.

In regulation of air commerce, revision of the regulations governing scheduled air-line operation, and a new procedure for investigation of accidents which includes public hearings and issuance of statements on individual major accidents, were among the year's accomplishments.

In the Bureau's development program on behalf of the private flyer, contracts were awarded for construction of experimental airplanes, engines, and propellers which gave promise of increased safety, simplicity of operation, reduction of costs, or combinations of these factors.

Equipment and technique for landing of aircraft in poor visibility were further developed, and the first instrument approach systems for general use were being installed at the end of the year.

The mapping program was speeded up through an allotment by the Public Works Administration so that many new sectional aeronautical charts became available during the year.

The change of name by which the Aeronautics Branch became the Bureau of Air Commerce was effected July 1, 1934. Headed by a Director of Air Commerce, the Bureau has two major divisions, Air Navigation and Air Regulation, each headed by an Assistant Director of Air Commerce. Immediately responsible to the Director are the following sections: Administrative, Aeronautic Information, Airports Marking and Mapping, and Development.

THE FEDERAL AIRWAYS SYSTEM

The new airways which the Air Navigation Division had under construction during the fiscal year, their mileage, and their status on June 30 were:

Omaha-Chicago, relocation, 388 miles (in operation).
New York-Boston, relocation, 318 miles (in operation).
Louisville-Indianapolis, 109 miles (in operation).
Galveston-Waco, 212 miles (in operation).

Tulsa-St. Louis, 351 miles (in operation).
New Orleans-St. Louis, 511 miles (in operation).
Fargo-Pembina, 143 miles (in operation).
Northern Transcontinental, from Seattle to Twin Cities, 1,504 miles (in operation except the section from Spokane to Bozeman, which was under construction).
Nashville-Washington, 584 miles (under construction with many of the beacon lights installed).

The foregoing was made possible by allotments of Public Works Administration funds. In addition, two shorter airway sections—Boston-Portland, 98 miles, and Boston-Concord, 63 miles—were partially equipped by using surplus material on hand in warehouses, and a similar project was under way on a 106-mile route from St. Petersburg to Orlando at the close of the year.

Of technical advances on the airways system, an outstanding development of the fiscal year unquestionably was the progress in radio assistance for landings. The Bureau's instrument approach system was adapted from the Army Air Corps blind landing system. After thorough tests by a group working independently as a blind landing section of the Bureau of Air Commerce, the system was found to be practicable, and the Air Navigation Division at the end of the fiscal year was installing radio transmitters for this service at two airports (Washington-Hoover Airport, Washington, D. C., and Newark Airport, Newark, N. J.), and preparing to do so at a number of others.

Ground equipment of the instrument approach system includes two radio transmitters 1,500 feet and 2 miles, respectively, from the airport and in line with the prevailing wind runway. Also, the approach to the runway, and the runway itself are marked by a row of lights. The lights on the airport are to be provided by the airport management, since the Bureau is prohibited by law from establishing airports or maintaining facilities upon them.

The radio compass, an essential factor in this instrument approach system, also is a valuable instrument for cross-country air navigation. Tests conducted by the Bureau over the Pacific Ocean during the spring of 1935 demonstrated that the radio compass is equally dependable for long over-water flights.

Blind flying between terminals is an accomplished fact and has been for a number of years. Air line airplanes are not cleared to depart for airports where the ceilings are known to be very low, as may become the case when instrument approach systems are in operation, but they nevertheless do, at times, have to navigate to the locations of airports by reference to the radio range beacons.

A difficulty in operations of this character lies in the fact that directional signals and weather broadcasts go out on the same frequency, and thus the one has to be interrupted for the other. This arrangement is required both by the limited number of frequency channels available, and by the need for simplifying the pilot's operation of his radio receiver. With both types of transmission on the one frequency, he does not have to change the setting of his dial.

However, if the pilot is flying blind and attempting to locate an airport, it is very disconcerting to have his directional signals interrupted for a weather broadcast. It means delay in finding the land-

ing area, perhaps at a time when the ceiling is lowering. The Bureau has recognized this contingency by authorizing radio operators to postpone broadcasts and keep the directional signals on the air continuously at times when pilots need and request this service.

This is not altogether satisfactory, because the weather reports may be needed by others, and because pilots with radio receivers but not transmitters may need continuous range service and yet be unable to request it. To meet this condition, the Bureau developed a method by which radio range signals and voice may be transmitted simultaneously upon the same frequency. The two sets of signals also may be received simultaneously in the airplane—directional signals operating a needle pointer on the instrument panel, and voice signals being received in the headphones. Such a transmitting station was placed in operation for practical service trials at Pittsburgh, Pa.

To mention briefly some other radio developments, one is the station location marker. Directly over the transmitter of a radio range beacon the airplane passes through a small area where no signals are heard—the cone of silence. To indicate this small area more definitely, the Bureau developed a transmitter which would flash on a light in the airplane. Nine of the markers were installed during the year.

A similar marker is used in the instrument approach system to indicate the exact locations of the two radio transmitters. A variation is the marker for high radio towers which indicates to the pilot by an audible signal (instead of a light flash) that he is approaching a high tower and should gain altitude, if necessary, to clear it. Complete standard radio stations of various classifications were designed for installation on the new airways. One was in operation at the end of the year.

Studies of radio teletypewriter and radio facsimile transmission were continued during the year with promising preliminary results. Radio transmission with an automatically typed or written record of the messages would enable the Bureau to replace its teletypewriter system for dissemination of weather information with a radio system, at a great financial saving. On some airways this function actually has been assigned to point-to-point radio, with the operators receiving the messages and making records of them.

A new radio direction finder was developed by a commercial firm under contract with the Bureau and flight tested by the Bureau.

In the business and management phase of the Federal Airways System, a new maintenance and cost-accounting control system brought about appreciable savings in maintenance costs, and the more complete records enabled the Bureau to locate surplus material promptly and withdraw it from warehouses for use in new construction.

A method of marking temporarily hazardous areas on intermediate landing fields by means of standard arrangements of flags and lanterns was adopted, making these indications uniform throughout the country instead of different in all the air navigation districts.

A change in the routine of weather-observation transmissions makes it possible for the Weather Bureau to draw up complete

weather maps covering the entire United States at major airports every 6 hours.

A new system of ratings for private aeronautical lights was adopted, providing a more flexible method of indicating the nature of these facilities in information supplied to airmen.

A compilation of statistics showing scope of the airways system at the beginning and end of the fiscal year follows:

Item	June 30, 1934	June 30, 1935
Airway mileage:		
Lighted—miles	17,315	20,769
Day (unlighted)—do	256	219
Lighted routes on day airway status (lights not operating)—do	1,499	726
New routes under construction—do	2,747	1,115
Intermediate landing fields—number	256	277
Beacon lights in operation—do	1,626	1,841
Radio communications stations—do	70	73
Radio range beacons—do	97	119
Radio marker beacons—do	78	55
Teletypewriter circuits—miles	11,814	12,739

REGULATION OF AIR COMMERCE

Authority of the Secretary of Commerce to prescribe and enforce safety regulations for scheduled interstate air lines was strengthened and made more explicit by an amendment to the Air Commerce Act which became effective in June 1934. The air line regulations were redrafted by the Air Regulation Division of the Bureau of Air Commerce and issued in their revised form with October 1, 1934, as their effective date.

Some outstanding new safety requirements are:

1. Multiengine aircraft capable of operation with one engine not functioning, are to be used for night flights and for flying over terrain where emergency landings are difficult.

2. An air line's system is set up in operating divisions with approval of the Bureau for the operating procedure of each division.

3. Each air line shall have an operations manual for each division, containing instructions on such phases as minimum altitudes of flight over specific airways, minimum ceiling for landing down through clouds at specific airports, procedure for take-off in event of forced landing, weather conditions which shall be considered sufficiently good for clearance on a given route, and other similar procedures in which safety is involved; this manual to be approved by the Bureau of Air Commerce.

4. An airplane which is to engage in instrument or "blind" flying shall be multiengined, and shall have two-way radio equipment in good operating condition. Detailed general safety requirements for instrument flying are set forth in the regulations—specific instructions for instrument flying on particular routes are set forth in approved operations manuals.

5. To guard against fatigue, a first pilot may fly not more than 1,000 hours in a year, nor more than 100 hours per month, and may not fly 100 hours per month for more than 4 consecutive months. In reaching that total, he shall not exceed 8 hours in any 24-hour period, or 30 hours in any 7-day period.

6. Dispatching procedure and personnel shall be approved by the Department of Commerce. A proposal to license dispatchers is under consideration.

Also concerned with air line operations are the proposed Special Requirements for Air Line Aircraft which were drafted during the year and sent to aircraft manufacturers and air line operators for comments and suggestions. These regulations deal with structural requirements, equipment, operation and maintenance, instruments, and performance tests. An aircraft intended for air line use would need to meet these special requirements, in addition to the applicable provisions of the airworthiness requirements for aircraft, and after meeting them would be assigned a license number preceded by "T" instead of the usual "C."

An intensive study of the effects of air line duty on physical condition of pilots, with special reference to fatigue, was undertaken by 37 of the Bureau's medical examiners who were designated "air line medical examiners" for this purpose. Air line pilots are reporting to these examiners every 3 months, and careful records of the detailed examinations are being kept to form a permanent basis for regulations pertaining to flight time limitations. In the meantime, the flight time limitations mentioned heretofore are in effect.

In regulation of flying in general, the Bureau's new airworthiness requirements for aircraft became effective during the year (on Oct. 1, 1934). Completely rewritten in this new edition, the airworthiness requirements were brought into line with the many advances which had been made in aerodynamic research, and in design practices and procedures since the drafting of the previous edition. Also the form of the publication was changed. Basic requirements were published in Aeronautics Bulletin No. 7–A, a pamphlet much smaller than the previous 7–A because recommended methods and information on design practice were omitted. The latter information was augmented and offered in a separate publication, Aeronautics Bulletin No. 26, Design Information for Aircraft, issued in loose-leaf form so that additions and changes can be made from time to time by furnishing new pages to holders of the book.

Requirements for pilot licenses were revised and brought up to date in the fiscal year 1934, and no changes in those applying to airplane pilots were necessary in the fiscal year just past. However, for lighter-than-air craft pilots, standard examinations were adopted covering physical condition, written tests on navigation, meteorology, engines, Air Commerce Regulations, and a flight check.

A new procedure for investigating and reporting on accidents in civil aeronautics, for which authority was given in the amendment to the Air Commerce Act mentioned heretofore, was worked out and put into operation during the fiscal year. Two important powers given to the Bureau by this amendment are the authority to conduct public hearings on accidents and authority to issue public statements on causes of individual accidents. The law prohibits the use of these statements, or of the reports of investigations and hearings, in any suits or actions growing out of the accidents.

Resort is had to a public hearing only for major accidents, and when the individual circumstances are such that this is the only method of gathering the necessary evidence and evaluating it. Since

enactment of the amendment there have been four public hearings. All of these have dealt with accidents on scheduled air lines, but the procedure is available for other civil aircraft accidents as well.

The first public statement on an accident was issued in September 1934, and others have been made public from time to time since, as necessary. Each statement reviews briefly the circumstances of the accident and gives the findings of the Accident Board as to the probable cause or causes.

The purpose in thus giving publicity to accidents, and in particular to their causes, is to inform the entire industry so that necessary steps can be taken in the designing of planes, training of pilots, and devising of operating procedures to eliminate recurrences.

As an indication of the present scope of the Air Regulation Division's work in general, there is presented a summary showing licenses, certificates, and ratings in force at the end of the fiscal year.

Pilot licenses, active	14,177
Scheduled air transport pilot ratings, active	691
Student licenses, active	19,251
Glider pilot licenses, active	111
Student glider pilot permits, active	263
Mechanic licenses, active	8,347
Parachute rigger licenses, active	370
Aircraft licenses, active	6,972
Aircraft unlicensed, active	1,911
Glider licenses, active	43
Gliders unlicensed, active	439
Approved type certificates issued for—	
Airplanes	576
Gliders	4
Engines	149
Propellers	508
Parachutes	53
Aircraft components and accessories	58
Airplanes approved for license without approved type certificate	505
Glider approved for license without approved type certificate	1
Domestic engines approved without approved type certificate	11
Engines having calibration rating	6
Propellers approved without approved type certificate	119
Pontoons approved without approved type certificate	32
Skis approved without approved type certificate	31
Foreign engines approved without approved type certificate	15
Repair stations approved, active	160
Schools approved, active	23
Ground instructors licensed, active	57
Flying instructor ratings, active	101

DEVELOPMENT OF FLYING EQUIPMENT

The Bureau's development program during the period covered by this report was concentrated on a program of fostering the design, construction, and development of safer, easier operated, more comfortable, and lower priced airplanes for private owners. With these four qualifications in mind, the Bureau contracted for several two-place airplanes of approximately 100 horsepower, for two conventional airplanes powered with automobile engines, propellers, a radial sleeve valve engine, and an engine propeller belt drive.

The projects are summarized below.

Contractor	Nature of project	Probable delivery date
Hammond Aircraft Corporation.	A 2-place pusher airplane with comfort and safety as first considerations.	November 1935.
Waterman Aircraft Co.	A pusher "tailless" airplane with promise of adaptability of production, roadability, comfort, and safety.	August 1935.
Autogiro Co. of America	Wingless, direct-control autogiro. In addition to the recognized safety, ease of direct control, and ability to land and take-off in restricted areas, the craft to be supplied to the Bureau will have a direct chassis drive for roadability.	November 1935
Fairchild Aviation Corporation, Kreider-Reisner Division.	Alteration of the Weick W-1 to accommodate a new aileron and flap combination in an effort to eliminate rudder and control gliding range through wide limits without change in gliding speed.	Under test at end of fiscal year at N. A. C. A. Langley Memorial Aeronautical Laboratory.
Curtiss-Wright Airplane Co.	An all-metal version of a two-place cabin airplane.	August 1935.
Fahlin Manufacturing Co.	An airplane with a Plymouth automobile engine adapted to aviation use.	September 1935.
Arrow Aircraft & Engine Co.	An airplane with a Ford V-8 automobile engine adapted to aviation use.	October 1935.
Casey Jones School of Aeronautics.	Endurance test of an Essex automobile engine provided with a v-belt drive to the propeller.	Report due August 1935.
Continental Aircraft Engine Co.	Development of a 6-cylinder radial air-cooled engine of the 2-stroke, sleeve-valve, uniflow scavenging type at a cost per horsepower of about half that for the present aviation engine and about 2 pounds per horsepower in weight	September 1935
National Bureau of Standards.[1]	Laboratory tests for determining a practical and satisfactory means of cooling pusher in-line air-cooled engines	
McCauley Propeller Co.	Solid steel, drop-forged propeller suitable for the 100 horsepower 2-place aircraft, and with cost reduction as the objective.	October 1935.

[1] On the usual cooperative basis—not a commercial contract.

In addition to the projects mentioned in the tabulation, the development section also has sponsored wind-tunnel tests from which certain aerodynamic combinations have been evaluated.

The Bureau's authority for development work was broadened by the same amendment to the Air Commerce Act which dealt with aircraft accident regulations, air line regulations, and other matters. This authority extends to development of flying equipment for all civilian and commercial purposes, but in the first year of the development section's existence, efforts were concentrated upon the needs of the private flyer, because those needs have received least attention in the past.

AIRPORTS

Under a new airport classification policy of the Bureau, the airports, marking and mapping section examines for compliance with the airport requirements only those airports which are used as, or are proposed for use as, air line terminals.

If an airport is adequate in size and equipment for the aircraft used in air line operations therefrom it is rated as eligible for air line operation. If not, the Department will not authorize the air line to use the airport as a terminal until it is enlarged or improved to meet the requirements.

Fostering the development of new airports and improvement of existing ones, the Bureau continued to give advice and assistance to States and municipalities on airport programs, and issued the first of a series of Airport Bulletins.

SECTIONAL AERONAUTICAL CHARTS

The Bureau in 1930 began a series of 87 sectional aeronautical charts covering the entire United States and showing geographical characteristics, airways, beacon lights, radio stations, and other features required by the airman for air navigation. Twenty-two of the maps were in circulation in November 1934, when the Bureau undertook an enlarged charting program with funds allotted by the Public Works Administration. At the end of the fiscal year 41 charts had been published. The remaining 36 had been compiled and flight checked and were to be available for distribution by fall. The charts are compiled and printed for the Bureau by the Coast and Geodetic Survey.

ADMINISTRATION AND DISSEMINATION OF INFORMATION

The administrative section, in addition to regular routine duties during the fiscal year, handled contracts, accounts, and personnel matters for the special projects carried out under Public Works Administration allotments. The aeronautic information section continued its duties of disseminating information through printed bulletins, articles for newspapers and magazines, and correspondence; compiling statistics on aeronautics; and supplying of information with respect to airports. In addition, the section prepared a motion picture entitled, "Safety on the Federal Skyways", illustrating the survey, construction, and operation of the Federal Airways System, and showing how the air navigation aids contribute to the safety of flight operations.

APPROPRIATIONS, PERSONNEL, AND AIR NAVIGATION FACILITIES

A tabulation showing amounts that have been appropriated for the work of the Bureau of Air Commerce since it began to function follows:

Fiscal year—	Aircraft in commerce	Air navigation facilities	Total
1927 [1]	$250,000.00	$300,000.00	$550,000.00
1928	700,000.00	3,091,500.00	3,791,500.00
1929 [2]	859,500.00	4,659,850.00	5,519,350.00
1930	958,000.00	5,458,620.00	6,416,620.00
1931	1,260,830.00	7,944,000.00	9,204,830.00
1932	1,369,660.00	8,992,640.00	10,362,300.00
1933	1,000,000.00	7,553,500.00	8,553,500.00
1934	1,070,570.00	6,590,210.00	[3] 7,660,780.00
1935	676,249.94	5,004,782.45	5,680,032.39
1936	734,800.00	5,175,000.00	5,909,800.00

[1] Second deficiency act, fiscal year 1926, approved July 3, 1926.
[2] Includes under Aircraft in Commerce $72,500 appropriated by the second deficiency act of 1928, and $85,000 appropriated by the second deficiency act of 1929, and under Air Navigation Facilities, $1,000,000 appropriated by the second deficiency act of 1928.
[3] However, expenditures were limited by Executive order to the following amounts: Aircraft in Commerce, $700,000; Air Navigation Facilities, $4,472,500; total, $5,172,500.

Statistics on personnel employed by the Bureau of Air Commerce on June 30, 1935, and at the same date of the preceding year, and paid from the appropriations Aircraft in Commerce and Air Navigation Facilities, follow:

Item	June 30, 1934			June 30, 1935		
	District of Columbia	Field	Total	District of Columbia	Field	Total
Paid from Aircraft in Commerce	119	97	216	109	100	209
Paid from Air Navigation Facilities	44	1,490	1,534	46	1,574	1,620
Total	163	1,587	1,750	155	1,674	1,829

Besides the above, there were on June 30, 1935, 164 Public Works Administration special employees on Public Works Administration projects, and 7 on development work.

BUREAU OF THE CENSUS

INTRODUCTION

The past fiscal year has been a most appropriate time for the Bureau to take stock of its resources, personnel, and equipment, and to appraise its potentialities as the Nation's leading statistical agency. It was the second completed fiscal year of the intercensal period between the Fifteenth and the Sixteenth Decennial Censuses, and, compared with the decennial periods, a year of less feverish activity. In January 1934, the Director of the Census requested the Central Statistical Board, with the advice and cooperation of the Committee on Government Statistics and Information Services (of the American Statistical Association and the Social Science Research Council), to undertake a survey of the technical and functional aspects of this Bureau. The Civil Service Commission cooperated with the Central Statistical Board by detailing two men to it for the analysis of the personnel phases of the inquiry.

On October 19, 1934, the Board made a report to the Director of the Census containing among others the following recommendations: (*a*) That the Bureau give special attention to the recruiting of new personnel, especially to the need for younger and professionally trained persons; (*b*) that it undertake a thorough training program for its present employees and those recruited hereafter; (*c*) that it develop and maintain a systematic analysis of the operations of the several divisions, and of the abilities of its employees; (*d*) that a well-planned welfare and recreational program be developed to aid cases of distress, either physical or financial, and to serve as incentives to greater and more effective production; (*e*) that there be created a position of "Executive Assistant to the Director", and that it be filled by a well-qualified man who would assist the Director in carrying out this program.

The Bureau has not only approved this report but has already taken notable steps in carrying out its recommendations. A careful recruitment policy has been followed and a course in elementary statistical procedures, such as those required of a statistical clerk, has been conducted for all temporary and professional clerks who wished to participate. A thorough training program was instituted for all employees assigned to work on the schedules and results of the quinquennial census of agriculture; and a special field-work course was given to candidates for the position of area supervisors on this inquiry.

The position of Executive Assistant to the Director has been created and to this unit were assigned the major operating and personnel programs of the Bureau.

In addition to the general report submitted by the Central Statistical Board, more limited reports, divisional in nature, have been requested from and given by (1) the Advisory Committee to the Director of the Census (appointed by the American Statistical Association and the American Economic Association), and (2) by the Municipal Finance Officers' Association of the United States and Canada. After a careful analysis of these three reports by outside agencies and a supplementary self-analysis, the Bureau has undertaken a rather thorough reorganization of its personnel and activities. The Bureau has been fortunate in securing the services of experienced medical statisticians for the positions of Chief Statistician and Assistant Chief Statistician of the Division of Vital Statistics, as well as other professionally trained personnel during the past fiscal year.

In order to better functionalize the work of the Bureau and meet the demands for increased data two new divisions have been created:

1. *The Division of Religious Statistics, General Information, and Records* will conduct the periodic statistical studies of religious bodies; will have general custody of all permanent statistical records of the Bureau which are not in current use for statistical purposes; will conduct the searches of population records for such purposes as legal certification of age; will have general charge of the preparation of general descriptive and informative materials on the activities of the Bureau, and of the printing of general reports.

2. *The Division of Territorial, Insular, and Foreign Statistics* will make the necessary compilations and comparative analyses of data relating to territorial and insular possessions of the United States; will supervise the collection of data in these areas; and will do research on statistical reports and methods of foreign countries.

The Bureau is now studying the general problem of scheduling its inquiries in such a way as to escape the serious effects of peak loads and intercensal lulls which have characterized the work of this Bureau since its creation as a permanent organization in 1902. It has been suggested that legislation be sought which would accomplish the following purposes: (1) Schedule the Bureau's program of inquiries more effectively from an administrative standpoint; (2) coordinate those which should be related to each other; (3) provide for a regular census of business, including wholesale and retail trade; and a quinquennial census of manufactures, with limited annual inquiries; and (4) secure legislative commitment in advance as to the most desirable dates of enumeration within the calendar year. It is thought advisable that once in each decade all of the Bureau's general economic inquiries should be brought together and that these inquiries should be conducted in a year conveniently removed from the decennial census year in which all general population and social inquiries are similarly brought together. Less comprehensive inquiries of both economic and social character would be scheduled on years other than those in which the two major groupings of censuses would be enumerated. This would provide continuous employment for expert personnel in the Bureau, and would help to overcome the necessity of training entirely new clerks for each decennial census, as well as lead to a more efficient use of the Bureau's space and equipment.

The following sections of this report are presented in accordance with the more important subject matter fields to which the Bureau's major inquiries belong. Special attention is called (1) to the progress which has been made on the Census of Agriculture, and to the innovations in this field; (2) to the completion of the Census of American Business and the substantial completion of the Census of Manufactures, both for the year 1933; (3) to improvements which have been made in current industrial reports; (4) to the adoption of new policies in the Division of Vital Statistics; (5) to the need for a national census of population discussed under the subject of "population estimates"; and (6) to the extension of services of the Bureau to Federal and other organizations in the conduct of special statistical inquiries.

CENSUS OF AGRICULTURE

Wide-spread changes in agriculture during the past five years, together with the formulation and administration of new public policies in this field, have aroused special interest in the 1935 Census of Agriculture. The preliminary results of this inquiry show that the number of farms in the United States has increased by 523,401, or 8.3 percent, since 1930, and 68,408,993 acres (6.9 percent of the total acreage in 1930) have been added to land in farms.[1]

This mid-decennial agricultural census represents a distinct improvement over that taken in 1925, both in speed and completeness of enumeration (particularly with regard to small farms), and in the expeditious release of primary tabulations for the country as a whole. The official enumeration of farms was started on January 2, 1935. All of the 6,812,049 schedules were completed in the field, edited and coded in the office, 23,181,236 tabulation cards were punched, and six State reports were sent to the printer by June 30. The first complete tabulation showing the number of farms, total acreage and total value by counties for the United States was released in less than seven months from the first regular enumeration, despite the great climatic difficulties faced by field personnel in northern areas.

More than 26,000 enumerators, working under 227 district supervisors, and 40 Bureau-trained area supervisors constituted the field force. The use of area supervisors, selected from a large number of candidates who took a special training course conducted by the Bureau, represents a departure from previous practice. That it has proved successful in overcoming a number of field difficulties in rural areas is indicated by the improved accuracy and rapidity of the canvass, and the consequent facilitation of office procedure.

A second new feature of this census was a simplified schedule with only 100 inquiries and no supplementary schedules. The 1930 agricultural inquiry included 253 questions on the general farm schedule, and some 15 supplemental schedules for special farm types and areas. The printing of all inquiries on one side of the 1935 schedule, using the reverse for brief instructions, also facilitated both field and office work. This schedule was the result of several months of study by a special Advisory Committee representing the Department of Agri-

[1] Number of farms in 1935, 6,812,049; in 1930, 6,288,648. Total acreage in 1935, 1,055,180,009; in 1930, 986,771,016.

culture, the Central Statistical Board, the Bureau of the Census, and other interested agencies. This committee also advised on tabulation and publication plans now being used.

Rural identification research.—Tests were made in 35 selected counties in connection with the Census of Agriculture to determine the feasibility of obtaining the necessary data to prepare rural identification maps. Very satisfactory work was accomplished in 29 counties on the major items of the location of farms and the centers at which farmers trade. This work should be extended in subsequent censuses to include at least all of the rural counties in the United States. In addition to providing an excellent check on the completeness of the enumeration of farms and rural population, it furnishes basic material for the use of other governmental agencies, such as the Resettlement Administration, Bureau of Public Roads, Rural Electrification Administration, and in the land utilization program.

CENSUS OF AMERICAN BUSINESS

The Census of American Business for the calendar year 1933 was completed and the results were published during the fiscal year just closed. Financed by the Civil Works Administration, this project was undertaken early in 1934. It includes data on retail and wholesale trade, and service, amusement, and hotel establishments. A series of reports were issued on each of these subjects during the first 6 months of the fiscal year. These reports gave information as to the number of establishments, net sales, employees, and pay rolls, by kind of business for each State and each city of over 50,000 population. Similar information was published by counties and by smaller cities for all kinds of business combined.

In order to meet the urgent demand for the publication of additional data obtained in this census, and to provide an allotment from which to defray the cost of printing the complete reports, a number of outside organizations, such as trade associations, publishing companies, newspapers, and other businesses, contributed funds to cover the cost of issuing the reports on stores and sales by business groups for States, counties, and cities; chains and independent and other types of operation; and stores and sales by size of business. These publications were issued early in January. Publication of the other final volumes and several special studies on retail and wholesale trade (a total of 20 volumes and 4 special studies, rotaprinted) was made possible by an additional allotment from the Civil Works Administration. These reports cover such subjects as credit business, new and old retail stores, new and old wholesale establishments, operating expenses, types of operation, etc.

SPECIAL SURVEYS OF BUSINESS ESTABLISHMENTS

This Bureau has made its services available to a large number of trade associations and National Recovery Administration Code Authorities during the past fiscal year. Many of the requests for information could be satisfied by relatively inexpensive office tabulations of Bureau data; a few required special canvasses. Illustrative of this survey type of service are the following:

Paint and varnish survey.—The Bureau was requested by the National Paint, Varnish, and Lacquer Association to make a canvass of dealers of paint and varnish in the States of Minnesota and Wisconsin. The work was begun on January 16, 1935, and completed on March 29, 1935.

Canvas goods survey.—At the request of the Canvas Goods Code Authority, a tabulation was made showing the distribution of sales of selected members of the canvas goods manufacturing industry for the calendar year 1933. The work was commenced on December 1, 1934, and completed on February 25, 1935.

Theater supply survey.—A tabulation was made for the Independent Theatre Supply Dealers' Association, Inc., showing invested capital, annual sales, number of employees, and pay roll, by years, for members of the theater equipment and supply trade. This work was undertaken on September 17, 1934, and completed on January 3, 1935.

Survey of reports of credit and capital difficulties of small manufacturers.—On behalf of the Business Advisory Council of the Department of Commerce, the Bureau of the Census made a survey of the credit and capital requirements of small industry. On July 31, 1934, schedules, accompanied by a letter explaining briefly the purpose of the survey, were sent to 16,500 manufacturing establishments selected from returns of the Census of Manufactures upon the basis of the number of workers employed during 1933. The canvass was confined, with few exceptions, to establishments employing on an average of not less than 30 nor more than 190 wage earners. Such establishments were canvassed in all industries except the following: Canned and preserved fish, crabs, shrimp, etc.; lumber and timber products; printing and publishing, newspaper, etc. (but other printing and publishing concerns were included); and railroad repair shops. Establishments in these few industries were omitted either because they were concentrated in a few sections of the country; because they were not, strictly speaking, in the manufacturing business, as in the case of newspaper publishing concerns; or, as in the case of railroad repair shops, because they were not producing for sale. The report on this survey was issued by the Business Advisory Council under the title "Survey of Reports of Credit and Capital Difficulties Submitted by Small Manufacturers."

BIENNIAL CENSUS OF MANUFACTURES

Work on the 1933 Census of Manufactures has been brought to substantial completion. During the last fiscal year preliminary industry reports were published, and 38 final reports, covering 192 industries, were prepared for printing. The first report of this series was issued in February 1935, a relatively early date compared with previous censuses. Seventeen industry reports, covering 72 industries, had been published and 12 others were in proof by the end of June. Because of limited printing funds, it was necessary to issue State and industrial area reports in rotaprint form.

The "general statistics" of this inquiry—number of establishments, number of employees and their compensation, cost of materials, fuel, etc., and value of products—were mechanically tabulated

in order to make practicable the compilation of detailed statistical information needed by the National Recovery Administration.

Conferences on the revision of general and special schedules for the 1935 Census of Manufactures are now being held, and a revised index of establishments is being prepared for this enumeration, which will be commenced at the close of the present calendar year.

ANNUAL REPORTS OF MANUFACTURES

The Division of Manufactures of the Bureau of the Census compiles annual reports of forest products and clay products.

Forest products.—The annual inquiry on lumber products is conducted in cooperation with the United States Department of Agriculture, Forest Service, and the National Recovery Administration Code Authorities (1933–34). The reports have been published since 1904 and at present cover production figures for lumber, lath, shingles, pulp, and paper for the previous calendar year. The canvass for lumber covers all mills sawing 50,000 feet or more. A preliminary report is issued annually (in April or May) for approximately 500 identical large concerns to provide an index of trends as early as possible.

Clay products.—The annual census of clay products for 1934 covered 1,610 manufacturing concerns. This inquiry has been conducted annually since 1921 and covers production, value, and stocks on hand of clay products, nonclay refractories, and sand-lime brick.

MONTHLY AND QUARTERLY INDUSTRIAL REPORTS

Improvements have been made in a number of the current statistical reports issued by the Bureau for 58 industries (or commodities), the original data for which are secured from reports furnished by 12,823 manufacturers and other concerns having 14,605 plants or mills. Among the improvements in this field may be noted the following:

1. A new report on Wheat Ground and Wheat Milling Products was issued quarterly, the statistics of which more adequately represent the entire industry, including small mills.
2. Monthly statistics on Knit Wool Gloves were published for the first time at the close of 1934.
3. A summary for identical plants for index purposes has been added to the report on Structural Clay Products.
4. The scope of the following inquiries has been expanded:

Air-conditioning Equipment	Prepared Roofing
Automobiles	Underwear and Allied Products
Cellulose Plastic Products	Steel Boilers
Plumbing Brass	Wool

A list of monthly and quarterly publications in these series is included under "Publications", below. Three additional monthly reports were started during the fiscal year but were abandoned because of basic changes in the National Recovery Administration. These were concerned with the activities of the imported date packing industry, the corset and brassiere industry, and the construction industry.

COTTON AND COTTON SEED

In compliance with specific acts of Congress data were collected during the past season from 14,784 cotton ginneries, 2,225 cotton-consuming establishments, 2,640 public cotton storages, 478 cottonseed oil mills, and 195 establishments refining, consuming, and storing cottonseed oil. There were issued 12 reports of cotton ginned to specified dates during the ginning season, and monthly reports of cotton consumed and held, cotton spindle activity, and cottonseed and products.

The crop of 1934 totaled 9,472,000 bales, compared with an average of 14,490,000 for the 10 preceding crops, a decrease of practically one-third. The consumption of cotton likewise decreased for the 1935 season to 5,360,000 bales, as compared with an average of 6,184,000 for the 10 preceding seasons.[2] Net exports of cotton amounted to 4,764,000 bales, compared with an average of 8,062,000 for the 10 preceding seasons.

Cottonseed crushed during the season totaled 3,550,000 tons compared with an average of 5,002,000 tons for the 10 preceding seasons. Although stocks of crude and refined cottonseed oil at the end of February 1934 totaled 988,000,000 pounds, the largest of record, heavy consumption during the fall of 1934 and the reduced production of oil during the season resulted in a carry-over of but 474,000,000 pounds.

FINANCIAL STATISTICS OF STATES AND PUBLIC BODIES

Financial statistics of State and local governments.—The decennial inquiry concerned with revenues, expenditures, indebtedness, assessed valuation, tax levies, and other important financial statistics of State and local governments for the year 1932 has been completed. Bulletins for each of the States and the United States Summary are available as separate reports or bound in volume form. In addition, digests of State laws relating to taxation and revenue have been prepared for 39 States, 12 of which have been issued.

Financial statistics of States and cities.—Since 1902 the Bureau has been required by law to compile annually financial statistics of cities with a population of over 30,000, and by order of the Secretary of Commerce, statistics of a like nature have been compiled on State governments since 1915; but by an Executive order of 1933, the collection of statistics of cities with a population of less than 100,000 and of State governments was discontinued for a period of two years. The 1933 report for 94 cities with a population of over 100,000 has been completed. A preliminary bulletin has been issued and manuscript for the complete report sent to the printer. Data for the 1934 report have been received from approximately half of the cities, and press releases have been issued for 36 cities.

At the request of the Director, the Municipal Finance Officers' Association of the United States and Canada made an extensive office and field study of the Annual Report on Financial Statistics of Cities

[2] Cotton distributed by the Federal Emergency Relief Administration, amounting to nearly 200,000 bales, was included in the monthly reports of cotton consumed.

and submitted a detailed report recommending an expansion of the work, a revised classification, and an improved and more modern method of presentation. This report has been approved in principle by the Bureau and a preliminary study of the technical and operating difficulties involved is in progress.

VITAL STATISTICS

For approximately one-third of a century the fundamental task of the Bureau in the field of vital statistics has been to extend the registration areas for births and deaths. With the completion of the birth area by the admission of Texas in 1933 this primary responsibility was ended. The past biennium has been a period of the appraisal of, and preparation for, new types of work for which the Bureau must now become responsible. These fall into two main types: (1) The improvement of all reports for the completed registration areas; and (2) the research in new fields of vital statistics which have now been opened.

In order to better meet its new responsibilities, the Bureau has strengthened the staff of this division by the appointment of several experienced medical statisticians. New appointments have been made for both the position of Chief Statistician and that of Assistant Chief Statistician.

Regional conferences.—Five regional conferences with State registrars were held during the past fiscal year. Problems pertaining to State administrative and registration affairs in relation to the Bureau, such as complete and accurate vital records, joint causes of death, classification of causes of death, and a compilation of useful and comparable statistics were discussed. These conferences promote better reported data and the early receipt of the transcripts in consequence of which the publication of the annual reports is more timely.

Birth-registration surveys.—Under the joint auspices of the Bureau and the States, and through the cooperation of the Federal Emergency Relief Administration, surveys of birth registration were conducted in 24 States. In 21 of these a marked improvement in registration has already resulted. In all cases the citizens of the State have a better understanding of the importance of birth registration.

Allocation of certificates by place of residence.—For a number of years the organizations which are most deeply concerned with the statistics published by this division have been urging the adoption of a policy of reporting births and deaths by the "usual place of abode" of the persons concerned in addition to the place of occurrence of the death or birth. The adoption of this policy by the Bureau during the present fiscal year represents an outstanding accomplishment in the field of vital statistics. Plans are being perfected for the tabulation of all births and deaths for the year 1935 by usual place of abode and also by place of occurrence, thus making them comparable with basic population statistics and with previous census reports. It is contemplated that for a number of years considerable attention will be given to this question of residence. A larger tabulation card has been adopted in order to carry this addi-

tional information and to provide more detail as to joint causes (or secondary causes) of deaths.

Annual reports.—Annual reports of natality and mortality have been prepared for the calendar year 1933, but because of insufficient printing funds have not been published. The publications for 1931 and 1932 were issued in limited editions. As indicated above, the 1933 report covers all births and deaths in the 48 States, the District of Columbia, Hawaii, and the Virgin Islands. Only mortality statistics are compiled for Puerto Rico. Efforts are now being made to include this territory in the birth registration area and to bring the remaining Territories and possessions, such as Alaska, Guam, and Samoa, into both areas.

Provisional summaries of live births, infant mortality, and stillbirths for each State and all places of 10,000 population and over were issued for 1934 and 1933. Summaries of mortality statistics were issued for the entire registration area for the same period.

LIFE TABLES

The Bureau of the Census is now preparing comprehensive life tables based on the census of 1930. Similar life tables were prepared by this Bureau following the census of 1910 but were limited to the original registration States which comprised the six New England States, together with New York, New Jersey, Indiana, Michigan, and the District of Columbia. Later the Bureau extended its tables to include the census years 1900 and 1890; but the tables for 1890 applied to only one State, Massachusetts. Abridged life tables covering 23 States were prepared following the census of 1920.

The completion of the registration area now makes it possible to prepare tables covering continental United States. In order to have comparable figures showing the changes in the expectation of life that have occurred within the last 30 years some of the tables are limited to the registration States of 1920, others to the original registration States. The general tables for the United States have been completed.

ESTIMATES OF POPULATION

One of the most baffling problems for the Bureau is the discovery of some satisfactory method for computing inter-censal estimates of population for States and cities.[3] Owing to the many recent shifts in population, the mathematical calculations heretofore used do not give even approximately accurate results, and no method by which such results may be obtained has been evolved. The Bureau has therefore been forced to discontinue the computing of such estimates until some new method is discovered or until another national census is taken. On this subject an officer of one of the larger life insurance companies comments: "The situation has gotten to the point of being a grim joke. Every birth rate and every death

[3] With the completion of the registration areas for births and deaths and the preparation of general life tables it is possible to make reliable annual estimates of total population by sex and age-group break-downs for the United States as a whole.

rate is wrong. All sorts of predictions and programs depend upon assumed populations. Estimates are weird and contradictory * * *."

Need for a mid-decennial census of population.—The need for accurate population figures for current statistical work makes it essential that a national census be taken in the immediate future. The Bureau has strongly supported each proposal for a mid-decennial census of population, particularly the Lozier bill, which failed of passage at the close of the Seventy-third Congress, and a proposed works project providing for a census of continental United States in the fall of 1935. More than 20 Federal agencies have supported the works project census proposal, and the Central Statistical Board has recommended it. State and local censuses, taken with a variety of schedules, instructions, degrees of completeness and local color, cannot be fitted together to give a satisfactory picture of the present population of the United States or form a basis for the satisfactory estimation of population.

SPECIAL POPULATION CENSUS

A special census of Alexander City, Ala., was taken under the supervision of a representative of this Bureau as of June 4, 1935, and a certificate of population was issued on June 14. This city showed an increase of 1,300 since the Fifteenth Decennial Census, April 1, 1930, when the population was 4,519.

PERMANENT STATISTICAL AREAS

In 22 cities permanent statistical areas known as "tracts" were established by local organizations with the active cooperation of the Bureau of the Census and an advisory committee of the American Statistical Association. These permanent geographical units are of great value to local agencies and organizations in securing continued comparability of their reports and in laying a basis for improved planning and administration. In 13 cities such units have been established in suburban areas beyond the city limits as well as in the city itself. To date all cities of 250,000 population or over have completed or are preparing tract plans, with the exception of Memphis, Tenn.

INSTITUTIONAL POPULATION

Statistics are obtained each year for patients in hospitals for mental disease, for mental defectives and epileptics in institutions, and for prisoners in State and Federal prisons and reformatories. Once in 10 years (1923, 1933, etc.) statistics are collected, in addition, for inmates of county and municipal penal institutions, juvenile delinquents, and children under institutional care. During the past fiscal year reports for 1933 were issued covering county and city jails, State and Federal prisons, and judicial criminal statistics for 24 States. The Report on Patients in Hospitals for Mental Disease is in process of printing, and manuscript was completed for the reports for that year on Juvenile Delinquents, Mental Defectives, and Epileptics in Institutions, and Children Under Institutional Care.

Beginning in 1932 the Bureau has also collected annually judicial criminal statistics in cooperation with the courts of general criminal jurisdiction in a gradually increasing number of States, now numbering 28.

REPORT ON NEGROES IN THE UNITED STATES

A special report "Negroes in the United States, 1920–32" was completed in the past year and is now in print. This volume supplements the report of this Bureau entitled "Negro Population in the United States, 1790 to 1915", and, like that report, gives a compilation of data collected and published by the Bureau of the Census concerning the major activities and characteristics of this important racial group in continental United States. These volumes make readily available, by States and by subjects, statistics which are scattered through the different census reports.

Among the subjects for which data are here presented are: The growth of the Negro population, its geographic distribution, and its shift northward and cityward; the characteristics of the Negro population for each State, by counties (with some heretofore unpublished detail); births and deaths in the registration areas; school attendance and literacy; retail business conducted by Negro proprietors; religious bodies; Negroes in State and Federal prisons and reformatories; the gainfully employed in 1930 by occupational groups; the tenure and value of Negro homes; and the value of the land and buildings, and the principal agricultural production on farms with Negro farm operators.

In addition to the volume, 30 special releases have been issued, covering different phases of the social and economic status of the Negro population. These releases, intended primarily for circulation among Negroes, have been requested and widely used by the other racial groups.

SEARCHING OLD POPULATION RECORDS

The need for legally acceptable evidence concerning ages of applicants for State old-age pensions and for other public and private purposes has made increasing demands upon the Bureau for certification of age from the information returned upon population schedules of decennial censuses. Thirty States now have old-age pension laws in effect and others are considering the enactment of pension legislation. The Social Security Act will inevitably accelerate the enactment of this legislation and result in greatly increased demands for certification of age.

During the past year 21,000 searches of the census records were made for the purpose of establishing age for pensions, annuities, retirement, working papers, and citizenship, or for genealogical or other purposes. It has not been possible for the Bureau to assign sufficient personnel to this work to handle expeditiously the volume of requests received, and there are now about 4,000 requests in the office for which searches have not yet been made. During the past year 5,984 visitors consulted the early census records, those from 1790 to 1880.

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These searches, each of which requires the handling of one or more volumes of original census schedules, present a serious problem of the maintenance of these important historical records. Such large-scale searches as are anticipated under the Social Security Act would quickly destroy the original documents. The Bureau has submitted to the Works Administration a project for the preparation of a card index of personal information by families for all persons enumerated in the 1900 census. Only this census gives the month and year of birth, as well as the age of each individual.

Because this index alone will not give protection to census records other than those for 1900, the Bureau is now considering methods of reasonable, permanent, photographic reproduction of the other most used schedules. This will not only assure the permanent preservation of these irreplaceable original documents, but will make them more easily accessible for use and materially reduce the storage space required for their current use.

WORK DONE FOR OTHER FEDERAL OFFICES AND OUTSIDE ORGANIZATIONS

In addition to the special surveys relating to business and industry, and to population (see above), the Bureau has served a number of other Federal offices and outside organizations by the conduct of surveys or by rendering other assistance, in the form of tabulations, mailing service, editing, coding, retabulation of regular census schedules, etc. Only the more important of such services are included here.

Emergency conservation work.—Monthly tabulations of the personnel and of work done in all Civilian Conservation Camps in the United States and outlying possessions have been prepared for the Emergency Conservation Work since July 1933. The camps are administratively divided into an increasing number of services (at present 11), such as the United States Forest Service, the National Park Service, State Park Service, Soil Erosion Service, etc. Tabulations are prepared of the number of man-days and amount of work completed by type of job and type of land for each service. During the last fiscal year the number of schedules has nearly doubled and is still rapidly increasing. Arrangements have been made for the continuance of this work through July 1936.

Federal Emergency Relief Administration.—A tabulation was made for this organization showing employment data by industries and by months, for all cities of 100,000 population or over, as reported on the schedules of the Census of Manufactures for the years 1929, 1931, and 1933.

The editing, coding, and tabulation of 486,473 schedules (collected by the Federal Emergency Relief Administration) was completed. The tabulations show the composition and characteristics of families and persons on urban relief rolls.

Dental survey.—More than 1,500,000 cards were punched and tabulated for the Bureau of Public Health Service.

Other agencies for which tabulations were made were: Bureau of Foreign and Domestic Commerce, Bureau of Fisheries, United States Shipping Board, National Recovery Administration, Bureau of Labor Statistics, Department of Justice, Committee on Economic Se-

curity, Central Statistical Board, Construction Code Authority, University of Pittsburgh, Curtis Publishing Co., and the A. C. Nielson Drug Co.

Many detailed cross-classifications were made possible in these inquiries at a reasonable expense by the use of the special unit counter tabulators developed by the Bureau of the Census.

Income from special surveys and tabulations.—There was received during the last fiscal year the sum of $278,280, either directly or through transfer of governmental funds, to defray the cost of special work allotted to the Bureau, work for other governmental and outside organizations, or for individuals. Of this amount, $242,697 was allotted for Civil Works projects (including the Census of American Business), or transferred from other governmental bureaus for special work, and $35,583 was paid by outside organizations for special tabulations, searches of old census records, copies of maps, etc.

EXHIBITS

During the past year the Bureau participated in four exhibits: The World's Fair at Chicago; the Municipal, Governmental, and Industrial Exposition in Cincinnati; the San Diego Exposition; and the Connecticut Tercentenary. Charts, maps, and other exhibit devices illustrating the census statistics were prepared for each exhibit and pamphlets describing the work of the Bureau were printed and distributed.

PUBLICATIONS

During the fiscal year just closed the Bureau has been able to complete and publish a number of Census reports which have been considerably delayed because of restricted printing funds. This has been possible because of the provision of limited special allotments for this purpose, and the increased use of the rotaprint reproduction process.

In addition to the regular publications, 2,597,315 copies of press releases of Census data were sent out on request and 163,747 printed reports (mostly bulletins) were distributed. A list of the reports issued follows:

1. Agriculture, Industry, Trade, and Finance

(a) *Decennial, biennial, and annual reports*

Retail distribution, 1930—part 3, volume I
Wholesale distribution, 1930—United States summary
Biennial census of manufactures, 1931, and 47 industry reports
Biennial census of manufactures, 1933, with 18 industry reports, 1 United States summary by States and industries
Census of agriculture, 1933—Rhode Island report
Cotton production in the United States, crop of 1933
Cotton production and distribution, season 1933–34
Forest products:
- Crossties and poles, 1931
- Lumber, lath, and shingles, 1932
- Paper and paperboard, pulpwood consumption, and wood-pulp production, 1932

Animal and vegetable fats and oils, 1929–1933
Financial statistics of cities of over 30,000 population, 1931

Financial statistics of cities of over 100,000 population, 1932
Financial statistics of State and local governments, 1932; also five State reports and United States summary

(b) *Quarterly industrial reports*

Animal and vegetable fats and oils
Edible gelatin
Electric (mining and industrial) locomotives
Electrical goods
Lacquers
Wheat and wheat-flour stocks
Wheat ground and wheat-milling products (merchant and other mills)
Wool stocks

(c) *Monthly industrial reports*

Air-conditioning equipment
Automobiles
Automobile financing
Babbitt metal
Bathroom accessories
Boots, shoes, and slippers (other than rubber)
Cellulose plastic products
Commercial steel castings
Convection-type radiators
Distillate oil burners
Domestic pumps, water systems, and windmills
Domestic water-softening apparatus
Electric industrial trucks and tractors
Fabricated steel plate
Fire-extinguishing equipment
Floor and wall tile
Hosiery
Leather and knit-wool gloves and mittens
Malleable castings
Measuring and dispensing pumps (gasoline and other pumps)
Mechanical stokers
Men's and boys' clothing cut
Methanol
Oil burners
Paint, varnish, and lacquer products
Paperboard
Plastic paints, cold-water paints, and calcimines
Porcelain enameled flatware
Porcelain plumbing fixtures
Prepared roofing
Public-merchandise warehousing
Pulverizers
Pyroxylin-coated textiles
Railroad locomotives
Range boilers
Steel barrels
Steel boilers
Steel furniture and fireproof safes
Structural-clay products
Sulphuric acid
Superphosphates
Terra cotta
Underwear and allied products
Vitreous china plumbing fixtures
Work clothing
Wheat ground and wheat-milling products
Wool consumption
Wool machinery activity

2. VITAL STATISTICS AND POPULATION

Mortality statistics reports for 1931 and 1932; also selected tables
Birth statistics reports for 1931 and 1932
Negroes in the United States, 1920–32
Prisoners in State and Federal prisons and reformatories, 1931 and 1932
County and city jails, 1933

MACHINE TABULATION

A central tabulating unit is conducted by the Bureau of the Census for the Washington offices of the Department of Commerce. There were in operation in this unit at the close of June 1935, 439 punch machines, 218 verifiers, 1 gang punch, 23 reproducing machines, 21 sorting machines, 21 adding tabulators, and 20 census unit tabulators. The machine tabulation work more than doubled during the last year as compared with the one immediately previous. There were 25,956,069 cards punched, from which 417,339,384 tabulations (card runs) were made at a cost of $513,870, in connection with the Bureau's work; and 4,360,063 cards punched, and 135,319,514 tabulations made at a cost of $214,170, in connection with the work of other governmental bureaus and outside agencies.

MECHANICAL LABORATORY

The mechanical laboratory of the Bureau does experimental work on tabulating equipment, with a view to its improvement, and also maintains the equipment in use. During the last fiscal year 12 unit tabulators were rebuilt in the laboratory for use in connection with the Census of Agriculture. These special census machines were originally built for tabulation of 24-column cards and are being converted for use with 45-column cards in order to handle the more complex type of inquiries now being conducted by this Bureau and to provide more adequate tabulation services for other organizations.

PERSONNEL

Mention is made above of the very irregular work load of the Bureau of the Census and of some of the difficulties which this creates. One of the major difficulties is that of the problem of personnel administration. On June 30, 1935, the Bureau had a total of 3,483 employees, of whom 1,472 were on the permanent force and 2,011 were temporary office and field employees. During the year the Bureau made a total of 29,189 appointments and had 29,897 separations. In addition to the employees reported above, there were 458 special agents whose salary was paid by other Federal and State agencies, or by nongovernmental organizations. These special agents are employees of the Bureau in the sense that their appointment and oath of office give them access to census schedules and other records. Maintenance of records for these employees, many of whom are appointed for very brief periods, is difficult and raises many serious problems of policy.

The following table gives the personnel changes which have occurred during the fiscal year ended June 30, 1935, broken down into the more significant groupings:

	Bureau total	Washington office	Field
Total employees, June 30	3,483	2,663	820
Permanent	1,472	670	802
Temporary	2,011	1,993	18
Total appointments	29,189	2,489	[1] 26,700
Permanent	122	46	76
Temporary	28,884	2,260	26,624
Reappointments	183	183	
Total separations	29,897	1,456	[1] 28,441
Terminations	27,884	964	26,920
Expiration of appointments	291	235	56
Transferals	56	56	
Resignations	1,652	190	1,462
Retirements	7	7	
Deaths	7	4	3
Special agents			
Total, June 30	458	212	246
Appointments	615	475	140
Separations	638	364	274

[1] Includes 26,624 enumerators, Census of Agriculture.

APPROPRIATIONS

During the fiscal year ended June 30, 1935, the work of the Bureau authorized by specific law was conducted under an appropriation for salaries and expenses in the amount of $1,679,787, including $86,287 represented by indefinite appropriation; under the appropriation for the Census of Agriculture, 1935, in the amount of $2,885,000, including $115,000 from indefinite appropriation, together with an allotment of $1,000,000 granted from Emergency Relief funds to pay for work in connection with the Census of Agriculture in the drought area, and a transfer of $15,000 from the Bureau of Air Commerce to the Census of Agriculture. In addition, $400 was allotted to defray the cost of the exhibit of the Bureau of the Census at the Chicago World's Fair and $1,000 was allotted to defray the cost of the Bureau's exhibit at the California-Pacific International Exposition.

Appropriations and other funds available, by source, fiscal year ended June 30, 1935

Purpose	Total	Source of funds		
		Appropriations	Transfers	Nongovernmental
All Bureau work	$5,868,067	$4,574,787	$1,259,097	$35,583
Regular salaries and expenses	1,689,787	1,689,787		
Census of Agriculture	3,900,000	[1] 2,885,000	1,015,000	
Work for other agencies	278,280		[2] 242,697	35,583
Exhibits	1,400		1,400	

[1] Includes $500,000 of the appropriation for the Census of Agriculture, fiscal year 1936, which became available in 1935.

[2] Does not include funds for clerical work of an administrative nature for the Federal Emergency Relief Administration and for which they paid.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

MAJOR FACTORS DETERMINING CHARACTER OF ACTIVITY

The character and amount of work performed by the Bureau of Foreign and Domestic Commerce during the past fiscal year has been determined by a number of potent influences in American economic life.

First, mention should be made of the unmistakable improvement in business conditions, with the heightening of domestic activity and the enhancement of interest in foreign markets. The effect of this has been directly and keenly felt in the Bureau which has been called upon for an enlargement and intensification of its services to private business—with a special emphasis on timeliness.

Second, the recovery program of the Government has not, during the past year, been so strongly characterized by the "emergency" note. There has been a steady systemizing and stabilization of effort in the various agencies, accompanied by the accumulation of the commercial data that they need. Consequently, the Bureau of Foreign and Domestic Commerce has not been obliged to respond to quite so many urgent and imperative calls for data, counsel, and other forms of active assistance as was the case in 1933 and 1934. It has, however, consistently aided a great variety of other governmental units—as will appear from the facts cited in certain of the succeeding pages.

Third, there has been the specific task of furthering—in the numerous ways that are only possible to an organization with such specialized equipment and experience as this Bureau—the Government's new policy of negotiating reciprocal trade agreements between this and other nations.

BUREAU CONTRIBUTION TOWARD THE TRADE-AGREEMENTS PROGRAM

This Bureau has been called upon during the past year for a considerable extension of its activities, in order that the Department of Commerce might make its distinctive contribution toward the reciprocal trade agreements program, upon which the Government has been earnestly engaged, since the enactment of the authorizing legislation in June 1934, as a major effort for the revival of American foreign trade. The division of labor among the various branches of the Government participating in the interdepartmental organization engaged upon this program has placed on the Department of Commerce, and particularly on this Bureau, the primary responsibility for bringing forward the essential information regarding American export interests and problems in relation to each country taken up for consideration, and for presenting the basis for the

requests to be made of the other country for the moderation of the trade barriers of every kind encountered by American producers and shippers.

Prospective negotiations for trade agreements, looking to the reciprocal reduction of the tariffs and other trade barriers now unduly restricting the sale of each country's products in the market of the other, have thus far been announced with 18 foreign governments. Taken together, the areas involved account for more than 40 percent of American foreign trade. They comprise 8 countries of Europe (Belgium, Finland, France and colonies, Italy, Netherlands and colonies, Spain, Sweden, and Switzerland); 9 of Latin America (Brazil, Colombia, Cuba, Haiti, and the 5 Central American Republics); and Canada. In addition to those countries with which negotiations are actually decided upon, the Bureau has been called on to make preliminary studies of the trade relations with other countries that have been considered for possible negotiation.

Thus far, five reciprocal trade agreements in this series have been concluded by the United States—namely, with Cuba, Brazil, Belgium, Haiti, and Sweden—and several additional agreements are expected to be completed within the next few months. The first 9 months under the new Cuban-American trade agreement—the only one which has been in operation for a sufficient period to allow a judgment as to results—have witnessed a marked revival of trade in both directions, with gratifying benefits to the producers in each country that have come to depend upon the other market.

This new task has called for careful study and integration of the information that has been built up through the years in the various divisions of the Bureau at Washington, not only regarding the trade barriers of various types that have grown up in each particular country, and the general economic and financial conditions now prevailing there, but also regarding the market possibilities and problems for each line of American production that had found an important outlet in the given country. This has required the concentration of the knowledge and judgment of all the divisions in Washington, focusing in succession upon the trade with each particular country studied or taken up for negotiation. It has also made necessary a number of additions to the Bureau staff, and the bringing to Washington of field officers from abroad.

The various studies required by the trade agreements program naturally constituted a major activity for the Division of Foreign Tariffs, second only to its regular services. The Division was called upon for special tariff studies in connection with each one of the countries with which the State Department had announced its intention to negotiate trade agreements, and a number of preliminary investigations in connection with other countries. In addition, its staff has been called upon for numerous studies of a broad scope required in the general formulation of the trade agreements program. To supply basic data for these agreements, the Bureau's Division of Regional Information has made extensive statistical and economic studies. The Finance Division of the Bureau prepared the financial sections of the "country studies" which the Bureau made for the use

of the interdepartmental committees, and was frequently called upon to furnish financial data to other agencies of the Government.

A special statistical analysis of United States trade with Cuba during the period since the effective date of our trade agreement with that country was issued by the Bureau's Division of Foreign Trade Statistics and proved enlightening both to Government officials and to the general public.

Every one of the industrial divisions of the Bureau has performed a variety of noteworthy services in furtherance of the Department's efforts to bring the trade agreements program to a successful consummation. For example, the work of the Foodstuffs Division has been practically doubled through the necessity of preparing statistical and other factual data pertaining to domestic production, American export, and international trade in nearly all food products.

The Bureau's district offices, also, have rendered extremely valuable service in connection with the trade agreements program. In connection with the consideration of each trade agreement, the district offices have made available, to their respective business communities, the data and information required by firms desiring to submit briefs to the committee for reciprocity information.

The studies preparatory to the reciprocal trade agreement negotiations necessitated the drafting of a number of the Bureau's foreign field officers as experts. About 10 percent of our Foreign Service officers, on an average, have been engaged in these studies during the greater part of the past fiscal year, being called in specifically for consultation on problems arising in connection with the study of their respective areas.

SERVICES TO OTHER GOVERNMENT AGENCIES

During the fiscal year just ended, other Departments and emergency organizations of the Government have increasingly recognized the outstanding position of this Bureau as an agency that gathers and interprets current economic data. They have therefore had frequent recourse to the services of the Bureau, for aid in the furtherance of their activities that look toward recovery, relief, and the general advancement of the national interest. A number of representative examples of such cooperation with other governmental agencies will be cited in succeeding paragraphs:

Agricultural Adjustment Administration.—The Bureau has rendered substantial assistance to the Agricultural Adjustment Administration in connection with processing taxes, problems of market agreements, and such specific questions as the development of so-called "exotics" in the chemical field. At the request of that Administration, the Bureau made studies and analyses of our export trade in tobacco. It has also compiled, for the Adjustment Administration, lists of foreign purchasers of agricultural products and raw materials.

Agriculture Department.—To the Department of Agriculture the Bureau has furnished data on naval stores, crude drugs, insecticides, plant introduction, soil requirements, animal byproducts, cellulose processing, and similar matters. For the Forest Service of that

Department the Bureau made a special study of the production, imports, exports, and consumption of wood pulp and paper throughout the world.

National Recovery Administration.—The Bureau supplied the National Recovery Administration with detailed figures on production, registration, advertising, new models, and exports of American motor vehicles, for use in a study of stabilization of the automobile industry. In numerous cases, the Bureau has furnished the Recovery Administration with pertinent statistical data on the domestic rubber, leather, and footwear industries. With that Administration the Bureau cooperated in a number of important studies of domestic tobacco manufacturing, leaf production, labor conditions in the industry, and foreign trade in tobacco.

Federal Emergency Relief Administration.—The Bureau has rendered significant assistance to the Federal Emergency Relief Administration, especially its divisions of Land Utilization, Subsistence Homesteads, Rehabilitation, and Economic Security. Also, members of the Bureau's staff have continued to cooperate with the relief agency on the purchase of textiles for distribution to the needy.

Tennessee Valley Authority.—Bureau experts supplied information to the Tennessee Valley Authority as to the possibilities in the field of electrochemical production.

National Resources Board.—The Bureau cooperated closely with the National Resources Board in supplying basic data on inland waterway operations and other projects in the transportation field. The acting chief of the Bureau's Transportation Division served on a transportation subcommittee of the National Resources Board which prepared tentative plans for a proposed national transportation survey to be undertaken in connection with the President's unemployment program.

Export-Import Bank.—The Bureau has cooperated closely with the Export-Import Bank, being called upon to aid in passing upon foreign credit risks, besides collecting and compiling detailed reports on foreign dealers.

Reconstruction Finance Corporation.—The Bureau has frequently been brought into consultation with the Reconstruction Finance Corporation with regard to conditions in different branches of American industry having a bearing on loans to individual firms. A specific instance of service was the Bureau's cooperation with the Corporation in studies of tobacco monopolies and tobacco loans.

Public Works Administration.—The Bureau cooperated with the Public Works Administration in studies of problems connected with facilities for the transportation of tobacco.

War and Navy Departments.—To the War and Navy Departments this Bureau has furnished data on war essentials, chemical warfare, procurement, and similarly vital matters. It has supplied facts regarding civil aviation in several foreign countries, and also concerning international trade in cattle hides and in rubber. The chief of the Bureau's Machinery Division was called upon by both the War Department and the Navy Department to aid in making out schedules of machinery to be purchased, and in preparing specifications. At the special request of the Assistant Secretary of the Navy,

he accompanied Navy officers on an extensive tour of navy yards for the purpose of selecting the proper equipment to replace obsolete machinery. At the request of the Navy Department, the Bureau devoted much time to the compilation of statistics showing the world production and movement of strategic raw materials.

Labor Department.—To the Department of Labor the Bureau furnished information and advice on home-industry possibilities in the chemical field, certain labor indexes, and similar matters.

Treasury Department.—The Bureau has given the Treasury Department the benefit of its data on dumping, taxes, narcotics, alcohol procurement, and related subjects.

Interior Department.—Among the topics on which the Bureau has furnished information to the Interior Department are potash, nitrogen, sulphur, phosphates, pigments, and coal processing.

Department of Justice.—To the Department of Justice the Bureau has furnished data in connection with foreign monopolies, as well as domestic antitrust investigations.

Tariff Commission.—The Bureau supplied the United States Tariff Commission with extensive data in connection with discrimination against American motor vehicles in various foreign countries.

Federal Aviation Commission.—The Bureau compiled statistical data regarding trade in aeronautical products, for the use of the Federal Aviation Commission.

Congressional committees.—As illustrative of work done for committees of the Congress, this Bureau canvassed all its foreign offices in areas where tin is produced, for the purpose of procuring information needed by a subcommittee of the Committee on Foreign Affairs of the House of Representatives.

Other governmental agencies aided.—Other Government units that were materially aided by the Bureau during the course of the fiscal year included the Post Office Department (parcel-post extensions and regulations), the Interstate Commerce Commission, the Smithsonian Institution, the Farm Credit Administration, the Federal Housing Administration, the National Emergency Council, the Central Committee on Statistics, the Security and Exchange Commission, the Civilian Conservation Corps, the Office of the Coordinator of Transportation, the Home Owners' Loan Corporation, and the Office of the Special Adviser to the President on Foreign Trade.

The chief of the Bureau's Forest Products Division made a 3-month trip to Europe to gather information on behalf of several Government agencies. He studied, in particular, small industries and small-house projects. He prepared an illustrated bulletin entitled "The Small-Housing Scheme of the City of Stockholm", which was released May 18 and has since created a great amount of interest among governmental as well as private agencies interested in low-cost house planning.

In connection with the building program and the Emergency Relief Administration, several new textile specifications were written which are expected to effect economies; members of the Textile Division of the Bureau have been serving as chairman and secretary of the technical committee on textiles of the Federal Specifications Board.

The Bureau rendered special assistance through a study of tire prices for the confidential information of high Government officials. Round-table discussion at a monthly meeting of Government employees (in various departments) handling work on rubber—instituted by the chief rubber expert of this Bureau—has proved signally helpful in keeping such workers better informed on current rubber activities.

COOPERATION WITH PRIVATE COMMERCIAL ORGANIZATIONS

Besides cooperating closely and consistently with most of the other units of the Federal Government, the Bureau of Foreign and Domestic Commerce has also been regularly in touch with a very large number of trade associations and other private commercial and industrial organizations, and the mutual assistance thus afforded has been of substantial advantage. Only a few representative instances of such cooperation will be enumerated here.

The Bureau's Chemical Division, during the year, continued to promote the formation of potentially helpful trade associations and research institutes; among the cooperative accomplishments in this field during 1934–35 were the new Tung Oil Institute and the Potash Institute.

The National Electrical Manufacturers Association appointed a special committee to study the many and varied services of this Bureau, and the association plans to prepare and send to its entire membership a bulletin describing the various ways in which the Bureau is capable of assisting the electrical industry.

Trade associations in the forest-products field have manifested during the past year a remarkable eagerness to enlist the Bureau's assistance for economic and statistical studies. Among these bodies are numbered the export division of the National Lumber Manufacturers Association, the National Wooden Box Association, the Mahogany Association, and the American Paper & Pulp Association. The Bureau's Forest Products Division has supplied trade associations with considerable basic data for "industry briefs."

The Bureau's Machinery Division made the remarkable record during the year of rendering special service to more than 120 different associations in the machinery industry and trade. Up to 1933, the machinery industry in this country lacked cohesive organization. The formation of associations was greatly stimulated by legislation enacted and administrative measures carried out under the present administration, but many newly formed associations were, apparently, without any clear idea of the proper policies that should be followed for the benefit of their members. The Bureau has helped, in many significant ways, the executives of such organizations.

The Bureau's Specialties-Motion Picture Division, which serves no fewer than 30 industries—among which are motion pictures; the graphic arts, such as printing and publishing; furniture; office equipment; toys and novelties; the photographic industries; scientific and professional instruments; glass and pottery—has been developing ever closer relations with the trade associations in these fields, as well as with the trade papers.

INDUSTRIAL DIVISIONS

EXPORT AND IMPORT SERVICES

The heightened interest in oversea markets recently displayed by American business men, and the strong governmental efforts to smooth the pathway of international commerce, have been reflected in a material enhancement—a general strengthening and intensifying—of the services to export and import trade rendered by the Bureau's Industrial Divisions. The following selected examples are believed to illustrate this service adequately:

The Automotive-Aeronautics Trade Division put out valuable studies covering such subjects as World Production and Export of Motor Vehicles, World Registration of Motor Vehicles, World Production of Motor Cycles, World Registration of Motor Cycles, Highways of the World, and the Detailed Analysis of Automotive Exports. The Division assisted officials of the Republic of China in their studies of administration of airways, communications, and related matters. It prepared a special report on travel conditions, costs, and transportation in the Cape Province of the Union of South Africa. Material was also prepared for the use of the delegates to the Pan American Commercial Conference at Buenos Aires, Argentina.

Through the medium of the Chemical Division's weekly bulletin World Trade Notes on Chemicals and Allied Products, the ever-changing situation abroad has been carefully presented through text and graphic charts; and, with the thought in mind of awakening an even livelier interest in foreign trade, a daily press-release service (occasionally supplemented by charts) was instituted by this Division. A world survey of chemical developments in 46 countries which was issued at the close of the fiscal year as a trade information bulletin and sold out in 3 days, necessitating a reprint, is further evidence of the chemical industry's renewed interest in foreign trade and the manner in which this Bureau is responding to the industry's needs.

As an aid in the sale of American goods abroad, the Electrical Division inaugurated in September a new monthly service in the form of a bulletin entitled "New Developments in the Electrical and Radio Industries", containing brief descriptions of all new products. Copies of this bulletin are mailed to all foreign offices of the Bureau and of the State Department. A new edition of the Electrical Glossary was prepared and sent to all American electrical exporters. A new service comprising a World Power Manual and Exporters' Handbook is now in course of preparation. Much favorable comment has been elicited by the publication of World List of Short-Wave Radiophone Transmitters. Following close upon the poularization of short waves throughout the world, television developments have reached a stage demanding special attention from the foreign-marketing point of view. Preparation for the inevitable demand is now being made by the Bureau through the acquisition of information as to the developments and the existing conditions.

During the past fiscal year, the Bureau's foodstuffs division added to its processed publications two new biweekly releases entitled, respectively, "Meats, Live Stock, Fats, and Oils" and "Fresh Fruits and

Vegetables", for the purpose of disseminating to the interested trades the large amount of material on these subjects that is being received from the foreign offices of the Bureau and of the Department of State.

The Forest Products Division undertook a number of special studies embracing imports and exports of pulp and paper products in the principal producing countries of the world. A study on newsprint was made for the Newsprint Service Bureau.

Increases in export trade brought added correspondence to the Leather and Rubber Division; and, besides continuing its statistical services on exports of leather and rubber products from the United States and (for some products) from leading foreign exporting countries, and maintaining the Tariff Manual Service giving information on customs duties on rubber products in each foreign country, this Division has prepared and distributed a leather fortnightly release as well as monthly releases relating to foreign-tire markets. The international rubber-regulation scheme stimulated interest in crude rubber, and the Bureau's Rubber News Letter has kept the trade fully informed of all vital developments.

A manuscript of more than 500 pages, discussing the production of and trade in leathers by all the countries of the world, was written and sent to the printer during the fiscal year. Special circulars covering the leather industry and trade of Rumania and Japan, the foreign trade in leather of Germany and France, and the world trade in vegetable tanning materials and extracts were issued during the year.

The promotion of foreign trade has been one of the major objectives of the Machinery Division throughout the year. The Division has continually called the attention of the industry to opportunities for foreign sales and has given specific advice on export technique to a large number of machinery manufacturers. Through the medium of trade associations and the trade press, as well as in speeches delivered at meetings of the industry, the desirability of maintaining and expanding our foreign trade has been regularly emphasized.

During the year the Bureau's Metals and Minerals Division, in collaboration with the commercial attaché at Tokyo, issued a trade information bulletin entitled "Fuel and Power in Japan."

A special activity of the Bureau's Specialties-Motion Pictures Division during the past fiscal year has been the collection and dissemination of data on foreign advertising media, such as newspapers, periodicals, and radio facilities. This service, which had at one time been discontinued, was resumed as soon as it became apparent that the Government's reciprocal trade efforts had stirred up a great volume of interest in foreign business. The increased flow of trade data from abroad (in conjunction with the facts available in the Bureau) has enabled this Division to publish a record number of foreign-market bulletins for practically all of the industries that it serves. The Bureau participated, through its foreign offices, in negotiations with the Government of Czechoslovakia for the reentry of American films (which had been barred since May 5, 1932) into that country.

The Textile Division completed a comprehensive study of the raw-cotton situation and the cotton-export problem. Pursuant to a Senate resolution, a special compilation was made of cotton consump-

tion in various countries for the past 30 years; a similar compilation of cotton imports and exports was made in cooperation with the Office of the Special Adviser to the President on Foreign Trade. Among other activities, a survey of Japanese competition in the world's textile markets was made. A renewed interest is indicated by the increase in subscriptions to the Bureau's monthly statistical statements covering textile items.

The American tobacco industry showed keen interest during the year in the analyses of foreign trade contained in the Tobacco Division's weekly release entitled "Tobacco Markets and Conditions Abroad." Largely aided by the cooperation of the Tobacco Division and the Shanghai office of the Bureau of Foreign and Domestic Commerce, the work of the Shanghai-American Tobacco Board of Trade was carried on successfully throughout the fiscal year.

AID AFFORDED TO DOMESTIC BUSINESS

Highly diversified were the services rendered during the year by the Bureau's industrial divisions for the assistance and advancement of business within the United States. For example, the Automotive-Aeronautics Trade Division supplied data to domestic manufacturers, merchants, and others on United States production and consumption of automotive appliances; furnished comparative operating costs of Diesel motors versus gasoline motors, as well as details regarding interstate regulations, to domestic operators of trucks; supplied regularly to United States commercial organizations the data on State registrations of cars and trucks; supplied individuals starting filling stations, garages, and testing stations with detailed data regarding equipment, rents, wages, employment, etc.; and furnished many firms with facts as to the cost of operation of passenger cars—such data to be used in calculating the proper allowance for salesmen using their own or company vehicles. The Division arranged for monthly reports on civil airplane registrations by States and makes. It maintained an exhibit at the American Road Builders' Show in Washington.

The development of the production of exotic agricultural products in the United States, through cooperation of national and State bodies, was promoted by the Chemical Division of the Bureau; outstanding in this connection was tung oil. As independence from foreign monopolies in essential raw materials can be maintained only through constant effort and watchfulness, the Chemical Division has striven to serve American producers of nitrogen, potash, iodine, and similar products, as well as interested Government agencies. A new foreign germicidal process utilizing silver was investigated and found satisfactory; after considerable promotional effort, the Division is able to report progress with this new agent in the field of bacteriological control.

The Electrical division has been sending to the Bureau's district offices in this country a monthly bulletin describing new developments abroad, as an aid to American scientific research and development.

The Foodstuffs Division made a Nation-wide survey of sales and distribution of confectionery, from information received as a result of questionnaires sent to individual manufacturers. A similar Na-

tion-wide survey of the mayonnaise and salad-dressing industry was conducted. The Bureau's reports of monthly sales of confectionery were continued during the year.

Among many other acts of helpfulness to the industries it serves, the Forest Products Division issued quarterly compilations of wood pulp in storage for the American Pulp and Paper Association.

The Leather and Rubber Division conducted periodical surveys of distributors' stocks of tires and rubber footwear, to enable the industry to measure consumer buying in these lines, and to help manufacturers in fixing production schedules. A survey of United States 1934 consumption and year-end stocks of crude and reclaimed rubber was made early in 1935 to determine the adjustments necessary to attain completeness in current monthly trade data on these subjects. Shoe manufacturers and wholesalers were aided in finding domestic areas that would purchase out-of-style high shoes. A special analysis of the number of retail outlets for tires in this country and a special analysis of the domestic excise tax on rubber tires were issued by the Bureau during the year.

American firms have very frequently called upon the Machinery Division for aid in solving their problems of production and domestic marketing.

A series of charts setting forth basic data relative to the domestic steel industry, and correlating material on all phases of that industry's growth and its relations with its workers, was prepared in the Metals and Minerals Division and received wide approval.

In connection with the general public movement for the appropriate utilization of leisure time, the Bureau's Specialties Motion Picture Division is cooperating with a recently organized group which seeks to develop additional recreational facilities for children in the congested areas throughout the country. Although this movement is essentially one for social betterment, its trade-stimulating possibilities have encouraged the Bureau to support this activity.

During the year under review, several countries have been engaged in a more strenuous effort to develop synthetic fibers to replace natural raw materials imported from other nations, and the Bureau's Textile Division has made frequent investigations of new types of yarns, fibers, and fabrics, which have been sent to the National Bureau of Standards for microscopic and chemical analysis.

FOREIGN COMMERCE SERVICE

Revival of interest in foreign trade has been reflected during the year by the constantly increasing demands upon the Foreign Commerce officers located in 32 leading commercial countries of the world. There has been a marked change in the character of the trade inquiries reaching the Foreign Service officer. A year ago the need was for more general information of an economic nature. During the current year the demands have been specific and related more especially to trade promotion. In order to meet the needs of the business public, Foreign Commerce officers have devoted more time to the preparation of reports in response to special inquiries.

Approximately 10 percent of our Foreign Commerce officers have been engaged during the year in work connected with the admin-

istration's program of negotiating reciprocity trade treaties with other nations. Because of the expert knowledge gained through years of special training these Commerce officers have served with distinction as members of various advisory groups.

Many of the Foreign Commerce officers have been in demand for trade conference work throughout the United States. Businessmen have sought their advice on specific problems. Many of them have been called upon to fill speaking engagements and several have made radio addresses.

Foreign Commerce officers had a prominent part in arranging programs in all sections of the country for the national observance of "Foreign Trade Week", May 19–25, 1935, during which period addresses were made by the Secretaries of Commerce and State and other high Government officials.

The duties of the Foreign Commerce staff were increased during the year by the new policy of the Government with respect to aid to be rendered to importers. These officers have been instructed to assist in locating sources of supply of commodities and materials that may be imported into the United States.

During the year there was a marked revival of cooperation between officials of the Bureau and businessmen. Based on experience gained during the past 2 years, the Bureau is preparing a set of instructions to Foreign Commerce officers which, it is believed, will not only enable them to continue to render useful service to American business in furnishing data regarding market conditions in other countries, but may make it possible for them to be of much *greater* assistance during the coming year. These new instructions contemplate an emphasis upon purely trade-promotional work and a material liberalization of permissible services.

FOREIGN-TRADE STATISTICS

Extensive cooperation was extended by the Division of Foreign Trade Statistics during the past fiscal year to a number of Government agencies. At the request of the Treasury Department, the Division took over from collectors of customs the compilation of the monthly report on foreign trade in gold and silver. Weekly reports showing this trade, by country of origin and destination and by customs districts, were initiated. The Division likewise prepared for the use of the Treasury Department, a weekly report on the imports of alcoholic beverages. Work was begun, also at the request of the Treasury Department, on the preparation of monthly estimates of the amount of duties collected, by tariff paragraphs.

A regular monthly report on imports for consumption, commodity by country, was supplied throughout the year to the Tariff Commission. This service was further extended at the request of the Commission by showing the customs district of entry. With the assistance of the Tariff Commission, an examination of the method of reporting weights of import commodities was made for the purpose of establishing the reporting procedure on a more uniform and accurate basis.

The Department of State was supplied with statistical tables showing the quantity and value of principal commodities exported to or imported from countries with which reciprocal tariff negotiations

were about to be initiated. In addition, the Division prepared for public use detailed statements showing the United States trade with these countries in the last 2 years for which statistics were available.

Other Government agencies with which the Division of Foreign Trade Statistics cooperated extensively included the Department of Agriculture, the National Recovery Administration, and the Office of the Special Adviser to the President on Foreign Trade.

In an effort to expedite the publication of United States foreign-trade statistics, the Monthly Summary of Foreign Commerce, previously published in two volumes, was published as one volume. Foreign Commerce and Navigation, containing the annual statistics of United States trade, previously published as one volume, was charged to a two-volume publication.

Annual statistics of imports for consumption in 1934 have been prepared for Foreign Commerce and Navigation, by country of shipment. In previous years, information of this nature was not available. Largely as an economy measure, the compilation of general imports, commodity by country, has been discontinued.

Figures on the trade of the United States with the world, exports and imports, commodity by country, the compilation and publication of which were discontinued in 1932 and 1933, were prepared for publication in the 1934 issue of Foreign Commerce and Navigation. A special statistical analysis of United States trade with Cuba in the 4 months following the effective date of the Reciprocal Trade Agreement with that country was prepared for public use. Statistics of trade by economic classes were further broken down to show the trade in each economic class subdivided into agricultural and non-agricultural commodities.

In response to Senate Resolution No. 11, the Division of Foreign Trade Statistics prepared tabulations showing the imports of competitive agricultural products by country of shipment during 1934 and the first 2 months of 1935, as well as statistics showing the world production, consumption, and foreign trade in cotton by countries for the period 1904–33.

Every month the Division has prepared approximately 150 special mimeographed statements and 200 typewritten statements showing foreign trade by commodities, countries, and customs districts—for the use of nearly 8,000 paying subscribers. A special monthly press statement of total trade by customs districts was initiated, and press statements issued in former years were continued in improved form and content.

GENERAL REGIONAL INFORMATION PROVIDED

The great amount of work performed by the Bureau's Regional Information Division in connection with the trade-agreements program is described elsewhere. Members of this Division are also serving on committees connected with the economic problems growing out of the approaching changes in the Philippine Islands.

The Division has continued its studies of broad international economic movements, including the subject of American branch factories in foreign countries, the experience of certain countries with cartels, problems of international trade, and current economic condi-

tions in the individual regions. Information on cartels was furnished from time to time to the National Recovery Administration and to other Government organizations.

A survey of manufacturing developments in the Latin American countries was undertaken, the results being issued in the form of a series of mimeographed monographs. These have so far included Brazil, Mexico, Peru, and Chile. Manufacturing developments in Argentina formed the basis for a special Trade Information Bulletin.

The Division prepared special studies dealing with Japan's trade expansion and its effect on the trade of other countries. A Trade Information Bulletin was completed on "Where China Buys and Sells." Another study is in course of preparation on the United States participation in the economic life of British India since the beginning of the World War. Studies have been prepared on the situation in the Philippine Islands and, for the use of an interdepartmental committee, on the effects of Japanese imports on the American cotton-textile industry.

The work of the Russian section has continued particularly active. Close cooperation with the State Department and other governmental units has been maintained. The Bureau's semimonthly Russian Economic Notes are taking on a permanent character, reflecting trends and tendencies of Soviet economy rather than isolated economic events.

Early in 1935, a new service was added to the periodic releases of the Regional Information Division—namely, a monthly Trade Review of Canada. This review, prepared in the Bureau's Ottawa office, with the cooperation of American consuls in Canada, furnishes data on Canadian foreign and domestic trade, agriculture, finance, industry, and business conditions in specific sales areas.

DATA ON FOREIGN TARIFFS AND OTHER TRADE RESTRICTIONS

Measurable progress in arresting and even reversing the trend toward more restrictive trade barriers—a trend that had characterized the several immediately preceding years—was an important feature of international trade during this past fiscal year. Although the year was marked by a new high level in the number of changes in import duties, quotas, and other import restrictions abroad (as recorded by the Bureau's Division of Foreign Tariffs), many of these changes were downward. While this downward movement has not been universal, import restrictions in some countries having been further increased, it is encouraging to be able to record definite results from the efforts made in many countries, including the United States, to relax trade restrictions as far as possible in order to assist in restoring international trade to more normal proportions.

In part, the actual or prospective reductions in duties and the relaxing or abolishing of other forms of import restrictions were in connection with the negotiation of Reciprocal Trade Agreements, such as those concluded by the United States under the authority of the Trade Reciprocity Act signed June 12, 1934.

While there were many changes, both increases and decreases, in import tariffs as distinct from other types of import restrictions, the net change is probably downward. At the same time, in some coun-

tries, especially in Latin America, new multiple tariff schedules were actually imposed or under consideration, primarily with a view to the balancing of trade with individual countries.

The regular work of the Division of Foreign Tariffs naturally increased in proportion to the greater activity in its field. Actually, there was an increase of about 16 percent in the number of tariff and other changes reported to and announced by the Division during the year, as compared with the preceding year, which in turn had witnessed a hitherto unprecedented number of such changes. The number of trade inquiries received by the Division increased in even greater proportion, there having been a growth of 35 percent in this branch of the Division's activities.

In connection with the regular analysis and interpretation of tariff changes for the information and guidance of American foreign trade, the Division conducted a number of special studies. The publication on Preparing Shipments to British Countries, which had been completed just before the beginning of the year, was issued, and a similar publication on Preparing Shipments to Europe was practically finished. Because of the large number of current changes in Latin American countries, the information on preparing shipments to this area has been revised in the form of individual mimeographed circulars for each country, rather than in a single printed volume. Many of these circulars were brought up to date during the year, and a number were reissued in completely revised form. A revision of Trade Promotion Series No. 91, Preparing Shipments to Canada, was completed, together with a revised copy of the circular on Canadian Customs Regulations on Tourists' Automobiles. A revised study of foreign antidumping and antibounty legislation was prepared and issued; and the annual study of foreign tariffs and trade controls, for which there is a very wide demand, was prepared and published as a special article in Commerce Reports.

Close cooperation with other governmental agencies continued, both in the Division's regular day-to-day work, and even more particularly in the studies made under the trade agreements program. The closest possible contact was also maintained with trade organizations, with a view to rendering the business community the most efficient service in meeting its foreign-trade problems.

VITAL STUDIES IN FINANCIAL CONDITIONS AND RELATIONSHIPS

The outstanding activities of the Bureau's Finance Division during the fiscal year 1934–35 have been those related (1) to its annual study of the Balance of International Payments of the United States; (2) to its contribution to the economic studies of countries with which Reciprocal Trade Agreements have been under negotiation (see p. 36); and (3) to a continuous study and analysis of foreign-exchange control and of exchange clearing and compensation agreements in foreign countries.

The staff of the Division was temporarily augmented in order to meet requests from other governmental agencies for more detailed information on the balance-of-payments position of the United States. Such information was particularly desired in connection with the Reciprocal Trade Agreements negotiations.

For the first time in our history, a census of foreign investments in the United States has been undertaken.

In response to numerous requests for a presentation of balance-of-payments data more frequently than once a year, a statement covering the first half of the calendar year 1934 was drawn up and published in mimeographed form. This innovation was well received, and, if possible, this practice should be continued.

The practical value of the studies of our balance of international payments which the Finance Divison has made for the past 13 years was evidenced by the nature of the demands made upon the Division for data on this subject. Not only were these data utilized by the Department of Commerce itself but also by the Departments of State, Treasury, and Agriculture, by the Federal Reserve Board, the Federal Reserve Bank of New York, the Tariff Commission, the Securities and Exchange Commission, and the Office of the Special Adviser to the President on Foreign Trade.

The chief of the Finance Division served as a member of the Interdepartmental Committee on Foreign Exchange Control. As in recent previous years, the Division devoted considerable attention to inquiries regarding foreign-exchange restrictions abroad. Because of frequent changes in the regulations governing foreign exchange and of the widening scope of exchange-clearing and compensation agreements in other countries, the importance of the work which the Division is doing in this field has been especially appreciated in export trade circles. As the Division is regarded as a central source of information on this subject, it has disseminated promptly and as fully as possible, through the fortnightly issues of Financial Notes and special circulars as well as press releases, data regarding new developments.

Despite its concentration on these major activities, the Division has continued to render a wide range of individual services to bankers, business men, and others on matters relating to international finance.

FOREIGN COMMERCIAL LAWS

Readjustment of world economic conditions during the past year has precipitated much new legislation abroad—a situation clearly reflected in the growing demands of American business on the Division of Commercial Laws and the increasing complexity of the problems presented to it for solution. Confronted with the necessity of raising more revenue, foreign governments have been especially active in creating new tax laws and increasing rates under existing laws. The facilities of the Division have been employed to the utmost in the effort to keep abreast of new legal developments and in making the necessary special studies of current taxation affecting the conduct of American business with or within foreign jurisdictions.

In this connection it is interesting to record that the Franco-American Treaty for the Elimination of Double Taxation, which was originally drafted in this Division, was finally enacted, releasing business from an onerous and disproportionate burden.

Technical information on industrial property was prepared for the use of the American delegation to the London Conference of the Union for the Protection of Industrial Property; the Division was

represented on the Interdepartmental Committee on Copyright and assisted in drawing legislation with a view to the entrance of the United States into the Berne Copyright Union; and technical assistance of definite ultimate benefit to American international traders was rendered to the Ways and Means Committee of the House of Representatives favoring the retention of the foreign-tax credit provision in the revenue act.

The facilities, legal files, and services of the Division were used to capacity for legal research in connection with the reciprocal trade agreements concluded and in course of negotiation during the year. Not only have American foreign traders commenced a renewed search for foreign markets for the export of their goods and services, requiring prompt and comprehensive reports of foreign legislative enactments affecting export trade, as well as American legislation designed to promote exporting, but they are exhibiting also a keener interest in foreign and domestic laws that restrict or facilitate importation of foreign-made goods.

New social legislation bearing on the conduct of American business abroad has been the subject of many inquiries addressed to the Division. Insurance legislation reflecting continued nationalistic tendencies in some countries has been closely followed by the Division because of its effect on American companies and their present policyholders and on the character of insurance facilities hereafter available to American interests abroad.

The Division has participated with very satisfactory results in the adjustment of numerous specific instances of improper trade practices detrimental to American business interests at home or injurious to American prestige abroad. Where direct assistance to complainants has been inexpedient, the Division has suggested other methods and has furnished on request the names of foreign lawyers from lists revised annually.

Ceaseless in its efforts to expose piracy of American trade marks abroad, this Division, by timely publication of possible infringements and by bringing them directly to the attention of trade-mark owners and attorneys, has been instrumental in protecting American industrial property of great value.

PERTINENT DATA ON INDIVIDUAL FOREIGN FIRMS

The demands on the Commercial Intelligence Division—which supplies sales-information reports and lists of foreign buyers to American exporters and importers—have become sensitive indexes of returning foreign-trade activity. It is noteworthy, therefore, that in the fiscal year just ended the number of sales-information reports furnished should have increased 30 percent and the number of lists of foreign buyers and sellers 27 percent over the previous fiscal year. These services, under the fee system, are seldom made use of unless the exporter or importer seriously contemplates going after new business abroad or is actually in receipt of foreign orders.

Considerably more than 50,000 letters transmitting information were written by the Division in reply to direct requests for these basic services in the 1934–35 fiscal year, an increase of 42 percent over 1933–34.

The Division maintains over 600,000 sales-information reports on foreign buyers and sellers located throughout the world. A substantial percentage of these were kept current during the year through requests from exporters and importers transmitted to the field. These reports are utilized not only by those Americans who are newly entering the foreign-trade field but also, to a much larger extent, by established houses that use this means of checking new inquiries and old accounts. In addition, several hundred confidential reports were sent out to credit and trade associations on reported unethical foreign-trade practices.

The 3,700 different lists of foreign buyers and sellers, maintained in the Division, were constantly being revised on demand during the year—three times as many new lists being compiled as last year. More than 500 new lists were thus added on the basis of demand. These lists give the names, addresses, sales organization, and size of the leading foreign importers, wholesalers, retailers, and sales agents for American exports in the principal markets abroad. Sales-information reports were available on most of them. In addition to these, 800 old lists were revised and 800 special lists were compiled as a result of specific requests.

Nearly 2,500 definite trade leads or trade opportunities were checked and disseminated to American exporters and importers during the year; on each a sales-information report was available. These were inquiries from foreign firms that wished to act as buying or selling agents for American manufacturers, exporters, or importers, or who wanted to buy or sell specified types of goods in the United States.

Domestic traders were offered a well-established service indicating sources of supply of raw materials or semimanufactured goods from abroad, particularly from those countries with which we have entered into reciprocal trade agreements. Sales-information reports on the individual foreign suppliers of these materials were made available to American importers.

The Division has cooperated closely with the export-import banks and is regularly called upon to aid in passing on foreign-credit risks and collecting and compiling detailed reports on foreign dealers. Lists of foreign purchasers of agricultural products and supplies of needed raw materials have been compiled for the Agricultural Adjustment Administration, and a quantity of material on domestic producers has been checked for the National Recovery Administration. The field officers of the Department of State have shown the usual splendid cooperation in prompt submission of required reports.

A new phase of an old service is to be found in the revived periodic reports from field men on mercantile credits and collections. These reports, regularly released in Commerce Reports under the heading "Credit Situation Abroad", provide hitherto unavailable data on the credit situation within a foreign country among importers, distributors, and consumers. Valuable statistical information on bankruptcies and liquidations and other indicators of credit trends has been compiled for the use of exporters and importers.

ACTIVITIES OF DISTRICT OFFICES

The district offices of the Bureau have been occupied chiefly in consolidating and restoring their facilities for serving business despite a greatly reduced personnel. As business emerged from the depression there was a very marked increase in the volume of routine inquiries received in the district offices. During the past year the number of these inquiries exceeded, by a large percentage, the number in recent previous years.

The work of the district offices in aiding the trade-agreements program is described elsewhere in detail. With the additional burden placed upon them as a result of this work, the facilities of all district offices have been taxed to capacity.

Much greater emphasis has been placed upon the domestic-commerce activities of the district offices during the past year. In conjunction with the Marketing Research and Service Division, a plan has been developed which will place greater stress on this valuable service. The district offices have unquestionably rendered very significant service to American business in making available factual data which point the way to new markets and new methods of marketing in the domestic field, an essential contribution in a period of economic recovery.

An outstanding feature of the district-office promotional work during the past year was the cooperation of district managers in the Foreign Trade Week program. Under their local leadership, arrangements were made for meetings, radio talks, and newspaper articles on the subject of foreign trade. One of the new duties undertaken by the Bureau's district offices in collaboration with departmental officials in Washington has been the inauguration of the news release entitled "Weekly Business Survey of Thirty-three Cities." Containing information dispatched every week by the Bureau's district managers in the commercial centers of the United States, this new periodical bulletin gives to business men a picture of the most recent developments in American trade and commerce. Having the benefit of intimate and extensive local contacts, the district managers are able to obtain and transmit to Washington much new and current knowledge on such matters as the immediate trends of wholesale and retail selling, the establishment or planning of new enterprises, probable increases and decreases in production and unemployment, innovations in design and style, factual data on bank clearings, the altered character of merchandise requirements, tendencies in the tourist business, and a variety of other important indices. As digested and summarized in the news release named above, this weekly array of centralized information has been welcomed by the business community.

ECONOMIC RESEARCH

The Division of Economic Research has extended during the year its compilation and publication of factual data for the use of Government agencies, business men, and students.

The Survey of Current Business, which is issued monthly, with a weekly supplement, has been distributed regularly to Government officials and to more than 5,200 subscribers. In addition to the more than 2,100 business series and monthly summaries of the

developments in major lines of activity, a new service was begun by the publication of a special article in each monthly issue beginning with September 1934. Lack of printing funds for the third successive year has prevented the publication of the Annual Supplement to the Survey, but, as a partial remedy for the omission of the Annual Supplement, monthly averages of the time series for the 3 years 1932–34 were published as a supplement to the April number.

The Division has also continued to issue a confidential weekly summary of business conditions to Government officials and to the district offices of the Bureau, as well as a weekly review for the use of the press and some 1,000 private subscribers.

During the year the Division has continued, with a slightly enlarged staff, the study of national income which was begun in the year 1932 at the request of the United States Senate.

The study of the long-term debts of individuals, business firms, and governmental units (discussed in the last annual report) has been in progress during the year and will be ready for publication during the coming fiscal year.

In addition to the services already noted, the Division made numerous special statistical tabulations during the year for intradepartmental use as well as for other Government agencies and private organizations.

MARKETING RESEARCH AND SERVICE

The Bureau's Marketing Research and Service Division was reorganized in November 1934, in accordance with recommendations of the Committee on the Elimination of Waste in Distribution, of the Business Advisory Council. The Division was then set up with seven sections, namely, Market Data, Wholesale Trade, Retail Trade, Consumer Market, Marketing Service, Trade Association, and Publications. The Publications Section was later separated into a distinct unit, under the supervision of the Publications Committee.

A program designed to expand greatly the scope and general usefulness of the monthly retail trade data now compiled by the Market Data Section has developed to a point where it will be possible to issue monthly data on several States early in the coming fiscal year. These new series will enable the Division to meet the many demands for regional, and even more detailed, data which have been received from users of the present series.

The Retail Credit Survey for 1934 has been expanded to include data on 12 trades in 79 cities, instead of 6 trades in 29 cities as in former years. The report was made available to the public 2 months earlier than last year.

The Wholesale Trade Section completed the program of the Real Property Unit, in addition to its regular activities on cost analysis and industrial marketing surveys. Two significant pieces of work were the publication entitled "Sources of Some Current Trade Statistics", which has met with the approval of business men, and the estimates of wholesale sales in 1934, which were published in January 1935.

The Retail Trade Section, in addition to the work on studies of parcel delivery, small retail stores, retail sales taxation, and other

current retail problems, has cooperated with the Federal Housing Administration and 15 universities and colleges in preparing a report on store modernization, which will be available shortly. An estimate of retail trade in 1934 was issued in February 1935 by this Section.

The Consumer Market Section is analyzing data collected in the Real Property Inventory and Financial Survey of Urban Housing, to determine the extent to which consumer durable goods are used by different income groups.

The Trade Association Section is receiving ever-increasing recognition as the leading governmental source of information on the Nation's trade groups. This section has cooperated with committees from the National Recovery Administration, Federal Housing Administration, Home Owners' Loan Corporation, and other recovery agencies in the compilation of lists and information concerning business organizations.

Revision of three of the Bureau's basic market-data books—Market Data Handbook of the United States, Atlas of Wholesale Grocery Territories, and Market Research Sources—has been undertaken in response to numerous requests for more up-to-date data of this character. The work of compiling the new data is under way.

In developing the program outlined in the above-mentioned Business Advisory Council committee report, the publication Domestic Commerce has been enlarged to about twice the former number of pages, and the number of paid subscriptions has been doubled within the past year. Comments from the field indicate that the material contained, as well as the new form of presentation, is more nearly meeting the needs of subscribers for up-to-date information on current marketing problems.

The Business Information Service, through the medium of abstracts and basic data sheets, provides businessmen with data on subjects pertaining to business problems. The number of abstracts and basic data sheets distributed by the Marketing Service Section has more than tripled during the past year. In order that the businessman may have facts at his finger tips, files of this material, available to the public, are being maintained with more than 250 qualified organizations throughout the United States.

In an effort to make the information collected by this Division more timely, reports have been rotaprinted instead of printed, so that they appear several weeks earlier than would otherwise be possible. Twenty-three publications—8 free and 15 on a sales basis—were issued during the year (not counting separately the Real Property Inventory Reports on 64 cities, of which approximately 90,000 copies were distributed).

SPECIAL WORK FOR NEGRO BUSINESSMEN

The routine work of the Bureau's Negro Affairs Division has consisted of furnishing information on the Negro's economic status, assembled from Census or other factual data. The types of information supplied have included such items as the following:

1. Lists of Negro newspapers and other periodicals and of theaters and motion-picture houses catering primarily to Negro audiences.

2. Home ownership and tenantry, farm and nonfarm, number and value by geographical areas (used by other governmental units and by private agencies for stimulating service in home improvement among Negroes).

3. The furnishing of information to Negro citizens in many sections, on such governmental agencies as the Farm Credit Administration, the Home Owners' Loan Corporation, the Civilian Conservation Corps, the Subsistence Homesteads Corporation, the Department of Labor, the Federal Emergency Relief Administration, the National Recovery Administration, etc.

4. Estimates and analyses of the purchasing power of Negroes in the United States. Published in Domestic Commerce, in Negro periodicals, and in the general press (valuable for advertisers and distributors).

The chief of the Division addressed business gatherings in a number of cities, and this service has resulted in increased demands on the Negro Affairs Division.

He also served as a member of the New York State Planning Board, the State's cooperating unit of the National Resources Board (on recommendation of this board, a permanent Planning Council has been authorized by law for the State of New York).

Conferences have been held with the officials of the State Department, rural-rehabilitation authorities of the Federal Emergency Relief Administration, officials of the Federal Credit Union and Press Intelligence Division, in order to obtain advice on services helpful to Negroes.

The office cooperated in the organization of Associates in Negro Folk Education, a movement devoted to advancing the knowledge by Negroes of economic and other vital questions. The Division chief is chairman, the program being financed by the Carnegie Foundation of New York.

SERVICES IN FIELD OF TRANSPORTATION AND COMMUNICATIONS

The Transportation and Communications Division has been taxed to capacity by the many demands and requirements to which it responded during the past year.

The administration's rehabilitation program developed during the previous year (involving the realinement of supervision over the various transportation media), in which this Department has taken an active part, has naturally increased the demands on the facilities of the Division. During the year, the emergency agencies created specifically to deal with transport problems continued to draw on the Division for information. While the amount of information supplied to such agencies was somewhat less than during the previous year, nevertheless the Division continued to cooperate with the Office of the Coordinator of Transportation, the National Recovery Administration, and the Business Advisory Council, in their efforts to bring the transport structure into line with other industries.

During the year the Division completed and released its study on Railway and Highway Transportation Abroad. This study affords an analysis of existing legislation, recent competitive measures, and coordinating policies of transportation services throughout the world.

In its commodity work in connection with the sale of railway equipment abroad, the Transportation Division cooperated closely with the Export-Import Bank, supplying detailed financial and economic information on foreign railways. These data were utilized by the bank as a basis for proposed credit on current export business.

With the assistance of the Bureau's foreign offices, the Division aided and facilitated visits to the United States by several delegations interested in the technical developments on our railways. Outstanding among these delegations were a group of engineers from the French Railways and a number of officials from the Chinese Ministry of Communications.

Shortly after the passage of the Foreign-Trade Zones Act, the Division was assigned the administrative work in connection therewith. One of the first functions relating to the administration of this legislation was the preparaton of an informal bulletin to acquaint citizens and municipalities with the terms and conditions under which foreign-trade zones would be established in ports of the United States. The bulletin has been given wide distribution.

The Division also cooperated closely with the Treasury and War Departments in the preparation of the rules and regulations under which foreign-trade zones will operate. It is expected that the rules and regulations will be issued shortly after the close of the fiscal year, and plans are already developed to handle applications as they are received.

Because of the increased interest in foreign-trade zones, the Division has undertaken extensive research as to similar developments abroad, in order that zones which may be established in the United States shall have the advantage of utilizing new and accepted practices as adopted in successful operations in foreign countries.

The Acting Chief of the Transportation Division was designated as executive secretary of the President's Interdepartmental Shipping Policy Committee, which conducted an exhaustive study and analyzed in detail the status of the American merchant marine and prepared a report which was later submitted to the Congress by the President. The Acting Chief was further named as executive secretary of the Foreign-Trade Zones Board and during the year served in this capacity both for the board and the interdepartmental committee. He also served as technical adviser to the transportation subcommittee of the Commercial Policy Committee, State Department, in compiling transportation data incident to the development of the trade agreements program.

The Division was called upon by a number of Federal agencies for services in connection with telegraphic and communications problems. It especially rendered assistance to the Federal Communications Commission in the supplying of basic data on communications abroad.

In conformity with the resolution of the Seventh Conference of American States, the Division assisted in the organization of a nongovernmental committee to encourage travel between the countries of the Western Hemisphere. The committee will act in an advisory capacity to the American delegations on matters relating to travel that may be discussed at future conferences of American States.

ACTIVITIES IN RELATION TO CONFERENCES AND EXPOSITIONS

During the fiscal year 1934–35 the International Conferences Section of the Bureau was combined with the Foreign Fairs Section under the title of "Conferences and Expositions Section." The functions of this unit are allocated to the Bureau of Foreign and Domestic Commerce because, directly or indirectly, trade development or the promotion of trade relations is involved. They comprise activities in connection with international and national conferences, fairs, expositions, missions to and from foreign countries, and related endeavors; likewise, the supplementary function of coordinating activities of all bureaus of the Department in furtherance of such projects. These functions necessitate conferring with other Government agencies, resident diplomatic missions, and unofficial organizations. During the past fiscal year the Department has been active in more than 30 conferences covering a broad field of commercial, educational, and scientific activities, and more than a dozen sizeable expositions, several of which were international in character.

In the case of certain conferences, such as the Pan American Commercial Conference held at Buenos Aires, Argentina, May 1935—the purposes of which are closely identified with those of this Department—the Bureau finds it necessary to designate a committee for preliminary work on the agenda over a period of several months; furthermore, it must designate a member on an interdepartmental committee which draws up the regulations and prepares the final program. For the conference just mentioned the Bureau contributed largely to the program, and three of its members were designated to attend.

Other conferences abroad—all international in character—which required the attention of the Bureau were:

Mining, Metallurgical, and Geological Congress and Exhibition, Tientsin, China, July 1934.
International Geographical Congress, Warsaw, Poland, August 1934.
International Council of Fisheries, meeting on board exploratory ship, September 1934.
International Radio Consulting Committee, Estoril, Portugal, September 1934.
Seventh International Road Congress, Munich, Germany, September 1934.
Second Conference on Inter-American Education, Santiago, Chile, September 1934.
Meeting of the International Technical Committee of Aerial Legal Experts, Berlin, Germany, September 1934.
Fourth International Congress and Exposition of Photogrammetry, Paris, France, November 1934.
Fifteenth Meeting of the International Telegraph Consulting Committee, Prague, Czechoslovakia, 1934.
International Cotton Congress, Rome, Italy, May 1935.
Eighth International Congress of High-Tension Electric Systems, Paris, France, June 1935.
International Housing Congress, Prague, Czechoslovakia, June 1935.
Conference to Revise the Convention for the Protection of Literary and Artistic Property, Brussels, Belgium, 1935.

The Department and the Bureau were interested in and represented at various conferences in the United States, a few of the more important of which were:

Thirty-fourth Annual Congress of the Fédération Aéronautique Internationale, Washington, October 1934.
National Foreign Trade Council, New York, November 1934.
American Mining Conference, Washington, December 1934.

Annual Meeting American Road Builders Association, Washington, January 1935.
Thirteenth Annual Conference of State Utility Commission Engineers, Washington, June 1935.
Chamber of Commerce of the United States (divisional meetings).

Two large international expositions occupied the Conferences and Expositions unit for several months. First, A Century of Progress, at Chicago, reopened for a second season, necessitated reconditioning and amplifying exhibits of 10 bureaus, attendance at Bureau, departmental, and interdepartmental committee meetings; a survey of the exposition in its entirety before the close, and preparation of a report thereon by the Section. The exhibit of the Bureau of Foreign and Domestic Commerce was in charge of a representative, who also assisted the Department and prepared its section of the report to Congress. Second, Federal participation in the California-Pacific International Exposition, opened at San Diego, Calif., May 29, 1935, having been authorized, from March 1 the Conferences and Expositions Section concentrated its efforts on preparation of displays, coordination of activities of all bureaus, and performance of liaison duties in conjunction with the Federal Commissioner and other Government agencies.

The department participated in the Third International Fire and Safety Exposition at Paris, France, June 1934 to July 1935. The Fourteenth International Aeronautic Exposition held at Paris in November 1934 and the Oil Equipment and Engineering Exposition at Houston, Tex., April 1935, were also participated in by this Department, as were exhibitions held in conjunction with the National Mining, Metallurgical, and Geological Exhibition and Congress, Tientsin, China, July 1934, and the Fourth International Exposition and Congress of Photogrammetry, Paris, France, November 1934.

EDITORIAL AND PUBLICATION WORK

The Editorial Division continued during the year its customary work of reviewing and editing manuscripts and preparing them for the printer in acceptable form. The careful proofreading of publications—as well as of many announcements and reports by officials of the Department and Bureau—also played a significant role in the activities of this Division. Moreover, members of the staff did a considerable amount of original writing of statements and formal memorandums embodying governmental policy with respect to business matters.

The functions of the Division were hampered by the inadequacy of the funds available for printing. There was some increase in the allotment, but the amount is insufficient when viewed in the light of the mass of material that might advantageously be printed by the Bureau to satisfy the requirements of the American business community. Studies of unquestionable importance, which would be welcomed by exporters or domestic traders, have had to be laid aside or indefinitely deferred because of inadequate funds.

Sometimes these data are put out by the Bureau through the medium of so-called "processed" publications, but it is generally recognized that this form is not so convenient, and not so favorable to permanently profitable utilization, as is the printed bulletin. Its use involves, moreover, an added burden on the Bureau staff.

For the coming fiscal year, the various divisions of the Bureau have outlined a program in which they indicate their desire to print numerous studies of demonstrated value, capable of being prepared from data at hand or obtainable with no great difficulty. Such, for instance, are the contemplated studies of Foreign Investments in the United States; the proposed study of The Development of Japan's World Trade; the survey of World Production and Trade in Alcoholic Beverages, a subject never before attempted by any governmental unit; the discussion of such a timely theme as The Use of Prefabricated and Ready-Cut Wooden Houses in the United States and Foreign Countries; a series of bulletins on Advertising Abroad; a factual appraisal of The Iron and Steel Markets of Latin America; and other special publications of similarly vital significance.

During this past year, the work performed in the Editorial Division contributed materially to heighten the effectiveness of such regular Bureau periodicals as the Survey of Current Business, Commerce Reports, the World Economic Review, the Statistical Abstract of the United States, and Foreign Commerce and Navigation of the United States, as well as of the special publications such as Trading Under the Laws of Great Britain, Railway and Highway Transportation Abroad, Foreign Trade of the United States, Fuel and Power in Japan, Manufacturing Developments in Argentina, Industrial Machinery in the Principal Foreign Countries, and World Chemical Developments in 1934.

A special Publications Distribution Section was established January 17, 1935. Its activities have been designed to develop a properly coordinated program for the adequate distribution of the Bureau's publications. It has continued the work formerly done by the Marketing Research and Service Division, broadening it to include all divisions and all phases of the Bureau's work. A start has been made toward the elimination of wastes in certain of the Bureau's mailing lists by the merging of some lists, so as to avoid duplication, and the building up of other lists to include as many as possible of those who could profitably use the Bureau's services.

ADMINISTRATIVE CHANGES—ESTABLISHMENT OF VALUABLE CONTACTS

The major administrative change in the Bureau during the year was the creation on May 15, 1935, of the new Metals and Minerals Division by consolidating the former Minerals Divisions with the former Iron and Steel Division—in anticipation of the transfer of certain of the personnel and records of the Minerals Division to the Bureau of Mines in conformity with the provisions of a section of the Interior Department Appropriation Act. Subsequently this transfer was accomplished, three members of the former Minerals Division and certain of its records being retained in the new Metals and Minerals Division in order that this Bureau's characteristic service to industry might be continued uninterruptedly.

The general trend of activity in, and service by, the Bureau is fairly exemplified by the fact that the Tobacco Division, during the past year, received more business men seeking advice on projects and problems involving tobacco manufacturing and foreign trade than ever before in its history—also more new people with plans to enter some new phase of the tobacco industry. In the Chemical

Division (to take just one more example illustrating the same tendency) the total correspondence, amounting to 6,500 letters, was 3 percent greater than during the preceding year, while the number of visitors who sought information and commercial advice in that Division registered a 20 percent increase and reached a total of more than 1,200 business men and women.

The Chief of the Metals and Minerals Division made several visits into steel-producing or -marketing areas for the purpose of exchanging counsel and data with the industry and trade as well as with a view to renewing and, when necessary, reestablishing confidence in and good will toward the Bureau.

An outstanding development of the year was the renewed interest of the various foodstuffs industries in the work of the Bureau. This necessitated a number of trips throughout the country by the Chief of the Division, as well as additions to the Washington staff of the Division, which was augmented by two additional section chiefs (to achieve greater specialization in the work), together with extra clerical and stenographic personnel.

In this field of contacts and cooperation, it may be mentioned that the Machinery Division has been zealous in bringing prominent executives of machinery firms and trade associations into more effective touch with officials of Government agencies—endeavoring especially to stimulate and encourage the members of the machinery industry to make full use of the facilities provided by this Bureau. Officials of the Machinery Division delivered numerous addresses at meetings of the industry.

Comparable activities have characterized the work of most of the Bureau's industrial and technical divisions throughout the 12-month period.

CONCLUSION

The fiscal year which ended June 30, 1935, has witnessed the establishment of the Bureau of Foreign and Domestic Commerce on a sound and economical basis, which should enable it to render a far greater service to business in the domestic and foreign fields than has been possible for several years.

The process of reorganization of the Bureau upon efficient business lines has been largely completed, and the morale of the Bureau personnel has reached a very high point. Among the outstanding contributions of the Bureau during the year just passed was the inauguration of the trade agreements program, to which the Bureau has contributed heavily through its foreign commerce officers, its tariff experts, and its industrial service units.

In the domestic field the Bureau completed in record time the real property inventory, which is one of the most widely heralded fact-finding projects that the Government has ever conducted. In approximately 9 months this great project has provided basic data without which the entire housing program of the administration would have been seriously hampered.

The thorough reorganization of the domestic marketing work of the Bureau was an outstanding achievement which has been accomplished during the past fiscal year. This work is now on a sound basis which was worked out in close cooperation with the Committee on Elimination of Waste in Distributon, of the Business Advisory Council.

NATIONAL BUREAU OF STANDARDS

The following report describes very briefly the more important developments at the National Bureau of Standards during the fiscal year 1935. The past 12 months have shown a distinct increase in the number of requests received by the Bureau from industries for scientific and technical data of basic importance in their particular lines of work. The results of the Bureau's work are increasingly sought by the general public as well as by scientists and engineers. These results are made available through publications in the Bureau's own series and by articles in scientific and technical journals. Over 250 such papers were published during the year.

GENERAL ACTIVITIES

Finances and personnel.—The appropriation for the Bureau for 1935 was $1,436,908, an increase of $72,043 over funds available for expenditure in 1934. The regular staff at the close of the year numbered 688 employees. In addition, 43 research associates supported by national engineering societies and trade associations were engaged on technical problems of mutual interest to the Government and industry.

Testing.—The testing of supplies and material for other Government agencies, which has long been an important function of the Bureau, exceeded in volume by more than 15 percent the testing of any previous year. This marked increase is attributable in part to the building activities of various Government and State agencies.

Visiting committee.—The present members of this committee are Gano Dunn, Charles L. Reese, Morris E. Leeds, Karl T. Compton, and William D. Coolidge. The committee held one meeting during the year to consider the program of work and the budget requirements of the Bureau.

International relations.—At the request of the Department of State, J. H. Dellinger served as chairman of the American delegation to the session of the International Radio Consulting Committee at Lisbon, September 22 to October 10, 1934. He was also head of the American delegation at the London meeting of the International Scientific Radio Union, September 11 to 19. Several members of the staff prepared reports for the sessions of the International Electrotechnical Commission at The Hague and Brussels, June 19 to 26, and of the International Commission on Illumination to be held at Berlin and Karlsruhe July 2 to 10, 1935. Morton G. Lloyd was designated to represent the Bureau at both sessions. F. C. Breckenridge also was sent as a delegate with particular reference to standardization of lights and signals for aeronautic use.

Lauriston S. Taylor attended the Fourth International Congress on Radiology at Zurich, where it was agreed to adopt the Bureau's method of characterizing the quality of X-radiation. This is based on the determination of the constant potential which furnishes X-radiation having the same absorption in copper as the source being standardized.

The Third International Conference on the Properties of Steam was held in the United States during September 1934, the first session being at the National Bureau of Standards. The objective of these conferences is to make a critical review of available data and to formulate a standard table with tolerances, to serve as a basis for working tables for engineering use.

Twenty-fifth National Conference on Weights and Measures.—This conference was held at the Bureau in June, being the first meeting of this organization since 1931. Widespread interest was shown in the conference on the part of weights and measures' officials and manufacturers of weighing and measuring devices; out of a total registration of 227, there were in attendance 107 weights and measures' officials from 22 States and the District of Columbia. Codes of specifications and tolerances for liquid-measuring devices and for vehicle tanks were expanded, the code for person-weighing scales was adopted in final form, and amendments were adopted to 9 other codes. The Director of the Bureau was elected president of the conference.

Public utilities.—The engineers of the utility commissions of the various States also held their annual conference at the Bureau in June. Fifteen States were represented and numerous engineering problems relating to public utilities were discussed.

Federal Fire Council.—The Manual of Fire Loss Prevention was published, several thousand copies being requisitioned by Government establishments. Fire hazard surveys of local welfare institutions were completed, including a report on St. Elizabeth's Hospital.

American Standards Association.—Work relating to safety codes has been carried on effectively by the Bureau for many years under the procedure of this Association. A procedure identical in all essential features was proposed during the year for handling building and plumbing codes, the Bureau taking an active part in its development. At the general conferences of manufacturers, distributors, and consumers held during the year for the public discussion of proposed commercial standards, under the auspices of the Bureau, the interested groups voted in every instance to submit to the American Standards Association for its approval the commercial standards receiving adequate industrial acceptance under the procedure of this Bureau. Three members of the Association staff are located at the Bureau to facilitate the cooperative work of the two organizations.

Federal specifications.—The Bureau takes a very active part in the development of purchase specifications for the use of departments and other Federal agencies. Much research work is carried on for this purpose, and many commodities are tested to determine whether they comply with the requirements of the Federal specifications, of which 987 have thus far been promulgated by the Government.

ELECTRICITY

Absolute measurement of electrical units.—Substantial progress has been made in determining the absolute values of the fundamental electrical units as a basis for a new international agreement. In the determination of the ohm from inductance coils of known dimensions, the measurements which have already been made give as the most probable value: 1 NBS international ohm=1.000450 absolute ohms.

Coils of new forms have been made for the current balance in order to determine more accurately the absolute value of the NBS ampere, but the data obtained with these coils have not yet been completely analyzed. The Bureau's best value therefore remains as 1 NBS international ampere equals 0.999928 absolute ampere.

Standards of electromotive force.—A secondary reference group of nine cells, each 0.05 *N* acid, was established. Since these cells are of a different type from the Weston normal cells of the primary group, a constant ratio of electromotive forces between the two groups would afford evidence of the constancy of both groups. Six months observations have shown variations of less than 1 part in 2,000,000 in the relative values of the two groups. A statistical study of 1,276 tests on unsaturated (portable) cells showed that about half of these cells changed no more than 50 microvolts a year, and about 80 percent changed less than 100 microvolts.

Comparisons with the International Bureau of Weights and Measures.—Two of the electrical-resistance standards constructed at the Bureau and deposited at the International Bureau of Weights and Measures were returned the second time for test. Although shipped by ordinary mail, both standards were found to have maintained their values within 1 part in 1,000,000 during the past 2 years. Measurements on four standard cells, returned from the International Bureau for comparison, indicated that between the two laboratories relative values for the volt can be established and maintained within a few parts in a million, by interchange of groups of cells carefully transported by messenger.

Standardization of electrical instruments.—The preparation of an American standard specification for electrical instruments has been carried on by a subcommittee headed by the Bureau's representative on the American Standards Association's sectional committee on electrical measuring instruments. A similar project, also under American Standards Association auspices, is under way on instrument transformers. The performance of transformers used in measuring large currents (1,000 amperes or more) has been found to depend on the manner in which the primary conductor is arranged near the transformer. The variation in the accuracy of transformation as the position of the primary conductor is changed is discussed in a recent paper.

Magnetic testing and research.—An alternating-current magnetic comparator, primarily for testing prison bars in place, and improved apparatus for the determination of magnetic hysteresis were developed.

Photometry and illumination.—More than 2,800,000 incandescent lamps were inspected for Government use, and more than 5,500

representative sample lamps were life-tested. Rating tests were made for the Federal Trade Commission and several States. About 225 lamps were standardized for manufacturers, universities, and testing laboratories.

Several groups of tungsten-filament standard lamps were prepared for an international comparison of candlepower standards based on the new scale which has been forecast by recommendations of the International Commission on Illumination and the International Committee on Weights and Measures. The primary basis of this scale will be the black-body standard at the freezing point of platinum; values for standards giving light of other colors will be derived by use of the "visibility factors" experimentally determined at the Bureau and adopted by the International Commission on Illumination.

A study of colors for aviation identification lights was completed, and specifications were prepared for the purchase of suitable colored glasses. Airplane position lights, landing lights, and marker lights, were designed, constructed, and measured.

Battery research.—Aeronautical storage batteries constructed in the laboratory with plates one-sixteenth inch in thickness were shown to meet specification requirements as to size, weight, and capacity, and to exceed by 100 percent the life of similar batteries containing one-twentieth inch plates. Tests on a variety of lead alloys for grids have been continued. Experiments on the fundamental reaction in storage batteries have shown definitely that two equivalents of sulphuric acid are consumed and two equivalents of water formed for each faraday of electricity discharged. The operating characteristics of several types of batteries on flashing lights were determined for the Bureau of Lighthouses.

Standards of radio frequency.—The reliability of the Bureau's primary standard of radio frequency was increased by the addition of another piezo oscillator and by improved methods of frequency determination. Standard frequency transmissions at 5, 10, and 15 megacycles a second are now broadcast 2 days a week. The addition of standard audio frequencies such as 1, 5, and 10 kilocycles a second, is being tried out experimentally.

Measurements of radio waves.—Studies of the transmission utility of the frequencies used for broadcasting show the North Atlantic path from Europe to United States to have very high attenuation. Substituting a high-mast antenna for the older T type resulted in increased field intensities at all distances up to 880 kilometers and decreased fading at the frequency used (1080 kilocycles) up to 150 kilometers over the particular area involved (East Central United States). Experimental studies were also made of transmissions at about 13,000 kilocycles. A theoretical study was made of ground wave propagation. The accuracy of the apparatus used in measuring intensity of radio fields was improved through the development of new methods and equipment. In the broadcast frequency band an absolute accuracy of 5 percent was attained.

Measurements made throughout the year of the heights and critical frequencies of the ionized layers in the upper atmosphere which are responsible for long-distance radio transmission, constitute the most complete body of data in existence on this subject. Applica-

tions were made to particular communication problems such as those confronting the airways communication companies. Measurements made during the partial eclipse of February 3, 1935, indicated that ultraviolet light was the chief ionizing force of the winter daytime F_2 layer as well as of the E and F_1 layers.

Telephone engineering service.—Assistance in meeting telephone service problems was given to various departments and independent establishments of the Government, particularly the Procurement Division, the Bureau of Prisons, and the Post Office Department.

Corrosion of pipe lines.—Examination of nearly eight hundred 12-year-old ferrous pipe specimens brought out no significant differences in rates of pitting of the commonly used materials. An apparently satisfactory simple laboratory method for determining the corrosiveness of soils was devised. Formulas have been developed for estimating the condition of a pipe line at any future time from a series of pit-depth measurements or from records of leaks.

WEIGHTS AND MEASURES

The Bureau has cooperated with the Coast and Geodetic Survey in the construction of graduated theodolite circles for use in precise surveys. These circles have very few errors in excess of 1 second of arc and none in excess of 2 seconds. A second of arc is about equal to the angle subtended by the thickness of a lead pencil when held a mile away from the observer. As a result of the marked gain in precision, the Coast and Geodetic Survey has submitted 16 circles of foreign manufacture for reconditioning and regraduation.

International standardization of geodetic tapes and wires.—In cooperation with the International Bureau of Weights and Measures and the National Research Council of Canada, measurements were made on four 24-meter invar wires from the International Bureau, on two 24-meter invar tapes from the National Research Council of Canada, and on two 24-meter tapes belonging to this Bureau. The results obtained at the three institutions are generally in excellent agreement, although there are a few slight discrepancies that need further study. This is an important step toward international uniformity and increased accuracy in geodetic measurements.

Volumetric apparatus and hydrometers.—More than 14,000 pieces of glass volumetric apparatus, capacity measures, and hydrometers were tested, the highest output for many years. About 92 percent of the glassware submitted was found to meet the specifications. Of the hydrometers submitted 73 percent received certificates. Nearly all of this apparatus, with the exception of the dilution pipettes, was of American manufacture. About 3,400 pieces of untested apparatus were on hand at the end of the fiscal year, in comparison with about 5,300 pieces on hand a year ago. The pressure of testing work has made it necessary to postpone important research on the density and thermal expansion of liquids.

Riefler clock.—A detailed study has been made of the performance record of the Bureau's Riefler clock which serves as the standard for testing watches, clocks, and chronometers. The study is of interest as showing the accuracy and reliability of the clock over a period of 30 years.

Weights.—The number of weights submitted for test was 3,162. This is slightly less than during the preceding year, and the work of testing has been practically up-to-date during the year. The character of the work has changed somewhat, as shown by the fact that there were about 1,000 less weights of "Class C", commercial test weights, and about 1,000 more, or nearly twice as many, of "Class S", analytical and similar laboratory weights.

Report on cooperative orifice meter tests.—The Joint Committee on Orifice Coefficients of the American Gas Association and American Society of Mechanical Engineers has prepared an extensive report on the orifice meter investigations made by the committee, including a review of other work during the past 15 years. This committee also prepared a special report for the gas measurement committee, natural gas department, American Gas Association, as a basis for new instructions on the metering of (natural) gas with orifice meters. The Bureau has taken an active part in this work.

Thermal expansion.—Papers have been published on the thermal expansion of artifical graphite and carbon, and of monocrystalline and polycrystalline antimony, and on an autographic thermal expansion apparatus. An investigation of thermal expansion of copper-beryllium alloys is well under way. Data have also been obtained on the thermal expansion of pure rubber, dental base-plate rubber, luxene, flexible coupling center, insulating material, iron-chromium alloy, invar, nickel steel, and chromium steel. Numerous requests have been received for blueprints and information concerning the fused quartz thermal expansion apparatus designed by the Bureau.

Identification.—The Bureau's expert on identification of handwriting and typewriting has testified in many important Government cases. In one case this testimony was a factor in saving the Government about $300,000. Another case involved payment of income tax on about $1,000,000. In a third case the testimony had an important bearing on the seizure and confiscation of a large store of narcotics and the apprehension of the leader of a narcotic ring.

Cooperative dental research.—This research in cooperation with the American Dental Association has resulted in a marked improvement in the general quality of dental materials and is of great value to the dental profession and to the public. The work has the confidence and support of reputable manufacturers as well as users of dental materials. The cooperation of the Federal Trade Commission is helping to keep defective materials off the market.

Dividing engine.—Work on the precision dividing engine for ruling diffraction gratings has been continued. Certain parts of the ruling machine have been redesigned with a view to eliminating variations in friction between the carriage and ways.

Certification of limit gages.—The tests on limit gages, gage blocks, micrometers, lead screws, penetration needles, polariscope tubes, and miscellaneous equipment showed an increase of 50 percent over the previous year.

Use of cadmium and krypton wave-length standards.—A method was developed for the use of cadmium and krypton wave lengths in the measurement of precision gage blocks up to 4 inches in length. This permits the certification of high-grade master blocks up to 20

inches in length, to an accuracy of 0.000001 inch per inch. They were previously certified to 0.000003 inch per inch.

Cooperation with standardizing bodies.—Work with sectional committees under the American Standards Association and with standardization committees of the American Petroleum Institute has been continued. Progress has been made in the development and approval of standards for small hose couplings threads, tolerances and allowances for cylindrical metal parts, and for gages used in the petroleum industry. Preliminary steps have been taken toward the standardization of rock drill bits, used by several departments of the Federal Government.

Railway track scale testing service.—Of the 19 master railway track scales in the United States, 13 were tested during the year; the remaining scales are on current testing schedules. All of the scales tested were within the maintenance tolerance of approximately 0.02 percent. Adjustments or other modifications were made of 7 scales, to reduce weighing errors or to effect other improvements in weighing performance.

A total of 1,240 railway scales owned by railroads and industries were tested in 38 States and the District of Columbia, on the lines of 124 railroads. About 78 percent of the scales were found to be accurate within the allowable tolerance of 0.2 percent. This figure is practically the same as that found last year. Faulty conditions were corrected on 153 of the scales encountered.

These findings are consistent with those of the three preceding years and indicate that the steady improvement in conditions exhibited over a period of years has temporarily ceased. On the other hand, no serious decline in accuracy has as yet been indicated.

Fifty-five railway-track-scale test-weight cars were standardized on the Bureau master track scale at Clearing, Ill. Twenty-six test-weight cars were weighed in the field, in connection with the operation of the Bureau's track scale testing equipments.

HEAT AND POWER

Effects of aging on clinical thermometers.—Numerous tests have been made on two lots of clinical thermometers obtained through the courtesy of two of the larger manufacturers. The results of tests extending over a period of about a year indicate that the requirement for aging is determined almost entirely by the need for aging the bulbs, and that, as far as allowing for the development of faults in the construction is concerned, there is little or no advantage in aging. Test of these thermometers is to continue.

Standard tables for thermocouples.—After a study of the characteristics of chromel and alumel as now manufactured, standard tables for these two thermocouple materials were prepared and accepted by the various pyrometer manufacturers. These tables were published in the Journal of Research (Research Paper 767).

Methods of testing thermocouples and thermocouple materials.—In response to a general demand for such information a paper was published in the Journal of Research (Research Paper 768) on the various methods available for testing thermocouples and thermocouple materials and the precautions necessary to attain various degrees of

accuracy in the experimental results. In particular, the methods developed and used by the National Bureau of Standards were described in detail.

Freezing point of gallium.—The freezing point of an exceptionally pure lot of the metal gallium was determined as 29.780° C.±0.005. The melting point of this rare element is so low that the metal crystals melt to a liquid on a hot summer day.

Heat of vaporization of volatile fuels.—Since it appeared possible that the heat of vaporization of fuels might be a factor in the formation of ice in the intake systems of aircraft engines in flight, data were secured by vaporizing the fuel inside a calorimeter by means of a current of air, thus permitting vaporization at ordinary temperatures. Measurements of a number of motor and aviation gasolines and a special "safety fuel" indicate that the heat of vaporization does not differ sufficiently to make it an important factor in the choice of an aviation fuel.

Properties of water and steam.—The experimental part of the extensive investigation of the thermodynamic properties of water and saturated steam in the range from 100° C. up to the critical temperature, was completed. A complete table, representing the results obtained at the Bureau and their correlation with results obtained elsewhere, was prepared for presentation to the Third International Steam Table Conference held in September 1934. The values adopted by the Conference are in very good accord with the table presented. The most important differences in the various results presented at the conferences were found in the range above 350° C., and accordingly a large number of additional experiments in this range were completed. A full account of this work is in preparation for publication in the Journal of Research.

Ortho-para hydrogen conversion.—The change of the vapor pressure of liquid hydrogen with time, resulting from the ortho to para conversion, was investigated in relation to its bearing on the use of the hydrogen vapor pressure thermometer as a secondary standard of temperature.

Hydrogen deuteride.—Pure hydrogen deuteride was prepared for the first time, and its vapor pressure, boiling point, and freezing point were determined and latent heats were calculated.

Fire tests of partitions.—In a series of tests, 75 of which have been completed, the fire endurance limits of thin, solid, and hollow plaster partitions in preventing spread of severe fires were found to range from one-half to 2 hours, depending on design and materials.

Fire protection equipment.—Fire-actuated operation tests of thermostatic water valves, automatic sprinklers, and thermosensitive elements for automatic fire-alarm systems indicated decided improvement over earlier types in the time of response and reliability of operation.

Marine safety.—Fire-hazard tests were made of bulkhead linings, deck coverings, flameproofed wood and textiles, and of materials carried as cargo and stores. A number of conferences on marine safety regulations were attended.

Phenomena of combustion.—The bubble method has been used for obtaining precise determinations of the effect of varying the mixture ratio and of additions of the inert gases argon and helium on

flame speed and expansion ratio in explosions of mixtures of carbon monoxide, oxygen, and water vapor.

Spark-plug specifications.—Specifications have been developed for the Navy Department covering shielded and unshielded mica aviation spark plugs of improved design. The improvements are based on a study of heat flow in spark plugs, a report of which is being prepared for publication. A proposed Federal specification for porcelain spark plugs has been drafted.

Aircraft engine cooling.—At the request of the Bureau of Air Commerce, a study has been made of the cowling and cooling of a small inverted in-line aircraft engine when used with a pusher propeller. Several cowling combinations were found which permit full-throttle engine operation at take-off.

Primary detonation standards.—Gasoline knock rating depends on the knocking characteristics of two hydrocarbons: n-heptane and iso-octane. These standard materials are being investigated to determine practical limits on their purity.

Rust preventives.—An investigation has been completed on the efficiency of a large number of rust preventing materials, with particular reference to their use in preventing corrosion in aviation engines during storage. Certain types of materials have been found to be extremely effective for this purpose and for use as general rust preventives.

Efficiency of oil filters.—Laboratory tests of a number of different types of automotive oil filters show that some of these devices are highly efficient in removing impurities formed in the oil during service.

Saybolt viscosity scale for petroleum products.—Work has been under way on the establishment of a new primary standard for the measurement of the Saybolt viscosity of petroleum products. This has involved a large number of comparisons of oil viscosities by the old standard and the new contemplated standard apparatus.

OPTICS

Standard wave lengths.—Availability of new photographic plates, sensitive to a considerable range of infrared radiation, has created a demand for standards among these longer wave lengths. Two recent publications, "Interference measurements in the spectra of noble gases". (Research Paper 710) and "Interference measurements in the infrared arc spectrum of iron" (Research Paper 755) provide this information.

Spectrochemical testing.—A new laboratory has been equipped especially for spectrochemical testing and development of test methods. It contains both grating and prism spectrographs of sufficient power to deal with practically all spectrochemical problems.

Railroad signal glasses.—Cooperating with the American Association of Railroads, signal section, and with Corning Glass Works, the Bureau has examined about 300 glasses for conformity to the colorimetric requirements of the newly established American Association of Railroads, signal section, specification 69–35, for signal glasses. More than half of these glasses have been found satisfactory and their transmissions have accordingly been measured. They are

to be issued to various manufacturers, with certificates, to serve as standards in the manufacture of colored railroad signal glassware.

Scale of color temperature.—The absolute scale of color temperature, based on the color of radiation from black bodies immersed in freezing platinum, rhodium, and iridium, has been checked for consistency by means of blue filters, and adjustments (less than 2°) within the uncertainty of the original determination have been made. Lamps representing this adjusted scale have been issued to the national standardizing laboratories of Great Britain and Germany and to the larger commercial laboratories in the United States.

Photographic sensitometry.—In connection with the international standardization of sensitometric methods, a study was made of the German proposals for measuring sensitivity, and the results incorporated in a national report to the International Congress of Photography, meeting at Paris in July 1935.

Airplane mapping.—Tests of airplane camera lenses have provided information on the performance of typical lenses of different types of construction which is serving as a basis for the formulation of standard specifications for all Government projects for airplane mapping. Computations made show that the distortion which arises from the glass pressure plate in a rectifying camera can be corrected by a suitable alteration in the position of the negative.

Ultraviolet solar radiation for health purposes.—In cooperation with the Council on Physical Therapy of the American Medical Association, and with the School of Tropical Medicine, San Juan, P. R., data were obtained on the intensity of far ultraviolet solar radiation as affected by the altitude and the geographic latitude of the observing station, the altitude of the sun, and by air pollution.

International standardization of length measurements.—For the purpose of international standardization, six fused quartz decimeter end gages were sent, two each to the National Laboratories of Great Britain, Germany, and the International Bureau of Weights and Measures in France. These gages have been measured at the Bureau to within 1 part in 5,000,000. They will be measured at the above laboratories and the results compared to determine the agreement attainable in such measurements.

Diamond points for ruling line scales.—The technique of grinding diamond points for ruling highly accurate line scales has been finally perfected. Independent tests of the scales ruled with these points show that the accuracy of setting on the ruled lines is about five times that obtainable on our present standards of the same denomination.

Refractometry methods.—As an additional step in the Bureau's development of precise refractometric procedures, correction tables for variations in the temperature, pressure, and humidity of air have been prepared for reducing refractive-index measurements to a common standard set of conditions. Also a critical appraisal has been made of the effects of temperature and pressure on the samples, and the magnitudes of possible variations in glass caused by strain, chemical heterogeneity, and heat treatment have been evaluated.

Radium and radioactive materials.—More than 1,800 radium preparations, having a radium content of about 11 grams and a market value of $660,000, were tested during the year. A new international primary radium standard was acquired and the Bureau's old secondary standard was found to be in excellent agreement with it. An improved photometric device for testing the brightness of luminous powder has been developed, a modified form of which can be used for testing luminous dials.

X-rays.—An investigation to find the best glass for protection against X-rays has revealed that there is an optimum combination of the lead and barium content of the glass, which varies with the excitation voltage of the X-rays. This relationship permits the selection of a glass which furnishes, for a given installation, the best protection per unit weight of the material; and at the same time insures adequate protection at minimum cost.

Aldonic acids.—Patents assigned to the United States Government were issued on: Process of oxidizing aldose sugars, and products resulting therefrom; crystalline magnesium xylonate and process for the preparation of magnesium salts of aldonic acids; process for preparation of calcium lactobionate: process for the preparation of crystalline gluconic acid. The first mentioned has already found considerable industrial application in the manufacture of calcium gluconate and is suitable for preparing other products, such as calcium xylonate and a new crystalline salt of calcium lactobionate and calcium bromide which is of value as a sedative.

Saccharimeters.—In the adjustment and standardization of saccharimeters, a special study has been made of the 100° point scale corrections. Important information has been obtained bearing on the method of correcting this point to conform to the scale adopted by the International Commission for Uniform Methods of Sugar Analysis.

Properties of glass.—It has been found that the expansivity of glasses, quite similar to those used in some thermometers, is reduced or increased more than 3 percent by lowering or increasing, respectively, the annealing temperature in the range 450° to 570° C. The effect of the annealing temperature on the refractive indices of several glasses has been investigated and it has been found that these indices are changed, depending on the glass, from 2 to 6 in the fifth decimal for each degree change in the annealing temperature.

Apparatus for the United States Customs Service.—A survey was made for the Bureau of Customs, Treasury Department, of the apparatus used in the determination of densities in connection with the appraisal of such products as imported oils, liquors, molasses, etc. Such apparatus, not of the requisite precision, is now being replaced with standardized equipment.

Polarization of raw sugars.—The investigation of the effects of basic lead acetate clarification on the direct polarization of raw sugars has been extended to include low-grade products such as molasses and sirups. Particular attention has been given to the question of light sources. Various types of lamps, as well as direct sunlight, have been used. The clarifying powers of many samples of basic lead acetate of different basicities have been measured.

CHEMISTRY

Platinum metals.—Methods were studied for separating the platinum metals from the base metals which usually accompany them. The methods for the separation of the platinum metals from one another, developed in previous years, were assembled for publication, showing the complete procedure for the systematic separation of the group. A survey was made of accumulated observations on factors affecting the serviceability of platinum laboratory ware.

Electroplated coatings on steel and nonferrous metals.—The exposure and accelerated tests on steel made in cooperation with the American Electroplaters' Society and American Society for Testing Materials are still in progress. The results for nickel and chromium coatings have been published, to be followed shortly by those for zinc and cadmium. Several thousand specimens are now being prepared for a similar study of plated coatings on copper, brass, zinc, and zinc-base die castings.

Specifications for electroplated coatings.—The Bureau cooperated with the American Electroplaters' Society and American Society for Testing Materials in the preparation of specifications for nickel, chromium, zinc, and cadmium coatings on steel. These have been adopted as tentative standards by the above organizations.

Rapid electrodeposition of nickel and iron.—Experiments in cooperation with the Bureau of Engraving and Printing have shown that ductile nickel can be deposited at very high current densities from nickel sulphate solutions, but not from nickel chloride. Experiments are now in progress on the rapid deposition of iron.

Atomic weights.—A redetermination of the atomic weight of gallium, based on the element to oxide ratio, has been made, and work has been started on a redetermination of the atomic weight of aluminum.

Standard samples.—During the year the Bureau added samples of nickel-copper-chromium (16–6–2), cast iron, and silicon carbide to its stock of over 100 standards. These now include samples of ores, ceramic materials, irons, steels, steel-making alloys, nonferrous alloys, and chemicals that are certified as to fineness, melting point, or their acid, oxidimetric, reducing, saccharimetric, or calorimetric value. Approximately 6,000 of these standards were sold.

Methods of analysis.—The use of 8-hydroxyquinoline in analyses of mixtures of compounds of aluminum, beryllium, and magnesium has been studied. Methods for the chemical determination of minute amounts of impurities in aluminum have been developed and compared with spectrographic methods. A study of the accuracy and sources of error of methods of gas analysis which depend on combustion is being made.

Gas appliance studies.—An investigation was made, in cooperation with the city governments of Dallas and Fort Worth, Tex., of the effects on appliance operation of adding inert gases to the natural gas supplied to those cities from the west Texas district. The average and the extreme limits of adjustments of a common gas appliance, as made by 80 men of experience in the gas industry, has also been determined.

Circular 405, "Standards for Gas Service", containing a discussion of service standards, definite recommendations, and a review of existing requirements, was printed during the year and met an unexpected demand, the first printing being sold out in about 2 months.

Paint specifications.—Revision of Federal specifications for gloss and flat interior paints, with detailed physical requirements for the completed paints, but without composition requirements, have been prepared. The elimination of composition requirements and the substitution of physical requirements of the completed paint is believed to mark a distinct advance in paint specifications.

Isotopic fractionation of water.—A partial separation of the isotopes of oxygen has been obtained by the fractional electrolysis of water. The isotopic composition of the hydrogen and oxygen gases liberated during electrolysis has been determined in relation to the isotopic composition of water undergoing electrolysis.

Thermochemistry.—The heat of combustion of isobutane has been determined accurately. This new value has been combined with the one previously obtained for normal butane to yield, for the first time, a value for the difference in the energies of formation of the two isomers of butane.

Hydrocarbons from petroleum.—Two additional hydrocarbons belonging to the hexane group have been isolated from the naphtha fraction of petroleum. New stills for distillation of the higher boiling hydrocarbons, apparatus for the determination of boiling points, and an ebullioscopic method for the measurement of molecular weights have been developed. A method of separating petroleum hydrocarbons by means of silica gel has been devised.

Rubber hydrocarbon.—The molecular weight of the sol rubber prepared at the Bureau was found by E. O. Kraemer, of the Du Pont Co., to be about 450,000, the highest ever reported. Work on the X-ray spectra of rubber hydrocarbon, in cooperation with Prof. G. L. Clark, University of Illinois, and on Raman spectra with S. D. Gehman, Goodyear Tire & Rubber Co., was continued.

Microscopical methods.—A study of the attainable accuracy of microscopical methods for refractive indices showed that optical properties can be reported to an additional significant figure.

Ink powders.—Two formulas were developed for ink powders that make a writing ink superior to the present requirements of the Federal specification.

MECHANICS AND SOUND

Testing of engineering instruments and appliances.—Some 1,200 engineering instruments were calibrated, of which about 850 were water-stream meters belonging to the hydraulic engineering bureaus of the Federal and State Governments. Tests to secure instruments of suitable accuracy for the measurement of beer for revenue-collection purposes were completed, and the calibration of master meters for checking field instruments has been in progress for the Treasury Department. The investigation and testing of fire-extinguishing equipment presented for the approval of the Bureau of Navigation and Steamboat Inspection has been continuously in progress. The accuracy and reliability of automatic mail-metering de-

vices were investigated for the Post Office Department. Performance tests were made of thermostatic radiator traps and air valves for approval for use on Government building projects. A study was made of a group of check-signing machines for the Treasury Department.

Acoustics.—The services of the Bureau are continually in demand by other Departments of the Government for measurement of the acoustic properties of building materials, for preparation of specifications for acoustic materials and for sound-picture apparatus, for tests of acoustic devices such as sirens for police alarms, and for engineering advice on acoustic problems, such as the reduction of noise. Public interest in the reduction of noise continues and advice and tests of material are frequently requested.

Aircraft instrument developments.—Instruments and equipment designed and constructed for the Bureau of Aeronautics, Navy Department, include an improved carbon monoxide indicator and equipment for testing the instrument in the field; several experimental models of a combination oxygen-breathing mask and radio microphone; a maximum airspeed recorder with a range of 500 miles per hour; an improved fuel flow meter; aerograph test equipment for field stations. Specifications for the directional gyroscope, the artificial horizon, and an engine cylinder-thermometer test-set were written for that Bureau. The altitude tables were extended to 80,000 feet, and reports on a method of testing oxygen regulators and on the measurement of altitude in blind flying were prepared for the National Advisory Committee for Aeronautics.

At the request of the Bureau of Aeronautics, an attempt is being made to find a lubricating oil for fine mechanisms which will be satisfactory over the range of temperatures experienced in aircraft operation during a period of at least 3 years.

Measurement of turbulence.—In cooperation with the National Advisory Committee for Aeronautics, further study has been made of the pressure sphere as a means of measuring the turbulence of an air stream, especially as to the influence of the average size of eddies in the turbulent flow on the pressure drop across the sphere. An improved hot-wire equipment has been designed and constructed. A new method has been developed, in which a measurement of thermal diffusion serves to indicate the degree of turbulence. Relatively simple equipment is used. A paper on the flow of air in a separating laminar boundary layer was published as a technical report of the National Advisory Committee for Aeronautics.

Aerodynamical characteristics of automobiles.—Two papers dealing with the technique and the results of wind-tunnel measurements on automobile models were published in the Journal of Research.

Vibrations of aircraft propellers.—Vibrations were set up in nonrotating propellers in the laboratory, and the stresses and deflections of the blades were measured by sensitive optical devices. The locations of the points of maximum stress were found to correspond closely to the locations of two of the three known types of propeller failures in service. Artificial propeller failures due to vibration were obtained in the laboratory that corresponded closely to one type of service failure. This work, together with a method of computing stresses in vibrating blades, was described in the Journal of Re-

search. An instrument to indicate dangerous propeller vibrations in flight is being developed.

Fixation of struts.—In cooperation with the Bureau of Aeronautics, Navy Department, an investigation has been made of the strength of columns, such as the compression members of riveted or welded aircraft structures for which the ends are restrained. About 200 column specimens of various materials have been tested with different end conditions, and a theory has been extended to apply to the design of such members in actual structures.

Wear tests of pintle bearings.—At the request of the War Department, wear tests have been made of pintle bearings intended for use in lock-gate bearings. Different combinations of materials, pressures, and conditions of lubrication were tried. Phosphor bronze was the only cup material tested which gave satisfactory service with pressures as great as 2,000 pounds per square inch. Pintles of various monel metals gave satisfactory service with phosphor-bronze cups. Lubrication with white lead or grease with a lead-soap base and asphalt content was found to permit pressures as high as 6,000 pounds per square inch.

Aircraft joints.—In cooperation with the National Advisory Committee for Aeronautics, further tests have been made of welded lattice and T-joints in chromium-molybdenum tubing. A report has been prepared for publication.

National Hydraulic Laboratory.—The staff of the laboratory has been working on 10 investigations during the past year for the Bureau of Reclamation, the Geological Survey, the Soil Conservation Service, and the Tennessee Valley Authority.

The investigations have included: (1) Studies of flow in open channels, such as the characteristics of control weirs for use in stream-gaging stations, erosion of stream beds by silt-laden water, and the laws of transportation of sediment by flowing water; (2) fundamental research on head losses at pipe bends and in straight pipes; and (3) miscellaneous problems, such as the efficiency of well screens, characteristics of divisors for measuring the run-off and eroded soil from agricultural test plots. A survey of the literature on draft tubes for hydraulic turbines, including recommendations for further experimental work, was prepared for the Tennessee Valley Authority.

The semiannual reports on current hydraulic research have been prepared and distributed to interested services of Federal and State Governments and to hydraulic laboratories in the United States and abroad.

ORGANIC AND FIBROUS MATERIALS

Properties of rubber.—The heat of reaction of rubber with sulphur in proportions from 0 to 32 percent was studied by means of an isothermal calorimeter. Refractive index measurements of rubber compounds were made by a method of total reflection which permitted the examination of dark colored and opaque samples. Quantitative relations between the refractive index and the composition were developed. Photoelastic measurements were made on transparent vulcanized rubber and quantitative relations were established between the double refraction, the tensile stress, and the composition.

Antioxidants in rubber.—An investigation of the effect of commercial antioxidants on the aging of rubber, including comparative tests under accelerated aging conditions, exposure to weather, and storage for periods up to 8 years, was concluded. Approximate numerical indices were developed for expressing the improvement effected by the antioxidants.

Hosiery.—The applicability of the Bureau's hosiery testing machine to the evaluation of variations in knitting, degumming, dyeing, finishing, and laundering was demonstrated. A survey was made of full-fashioned silk hosiery from stores throughout the United States to provide a basis for a performance specification. The National Association of Hosiery Manufacturers was assisted in formulating standard constructions for hosiery and in preparing a book entitled "The Manufacture of Hosiery and Its Problems." In addition two technical papers were published.

Textile test methods.—A method developed for the quantitative analysis of textiles containing two or more of the five common fibers was developed, which has been adopted as a tentative standard by the American Society for Testing Materials. A study was made of the fading of dyeings in radiation of different intensities in connection with the standardization of tests for fastness to light.

Wool textiles.—Work on the chemistry of wool, in cooperation with the American Association of Textile Chemists and Colorists included: A study of the effect of alkalies on wool; determination of the amino-nitrogen content of wool; a new method for the arginine content of protein; and the selective adsorption from soap solutions. Methods of known accuracy for the quantitative analysis of wool for total sulphur and sulphate sulphur were developed and published.

Underwear.—The Bureau cooperated with the Underwear Institute in developing additional standards for both knit and woven underwear and in revising the old standards. A new edition of the "Standard size" booklet of the institute was prepared, and an article on the properties of knit underwear fabrics was published.

Effect of fumigants on record papers.—Fumigating gases, used in libraries and other depositories to rid books and papers of destructive insects were investigated at the request of the National Archives, with the cooperation of the Bureau of Entomology and Plant Quarantine. Representative book and writing papers were exposed to various gases, and were afterward subjected to chemical and physical tests for deteriorative effects. It was found that such fumigants as hydrocyanic acid, carbon bisulfid, ethylene dichlorid, ethylene oxide, and methyl formate may be used without measurable injury to the paper.

The papermaking quality of cornstalks.—In an investigation of the practical possibilities of utilizing cornstalks for paper, pulping difficulties presented by structural characteristics of the plant were overcome by special mechanical preparation. The fibers were not strong enough for use in brown wrapping papers, but bleached pulp suitable for writing paper and greaseproof specialties was obtained. Yields were very low, making raw materials and processing costs comparatively high.

Lithographic printing.—Results of experimental offset printings made in cooperation with the Coast and Geodetic Survey explain some of the most troublesome register difficulties and point the way to new and more scientific methods of conditioning paper for lithography. Application of the information has resulted in reduced spoilage and improved quality of printing. Hygrometric changes were found responsible for practically all distortion in the printing.

The effect of acid on leather.—The measurement of the hydrogen-ion concentration of a water extract of leather was found to be a more satisfactory guide than a quantitative estimation of the acid present in predicting the loss in tensile strength of leather during aging.

Moisture relations of aeronautical materials.—A study of moisture absorption by aeronautical textiles covered with various plastic materials indicated that fabrics doped with cellulose derivatives absorb only small amounts of moisture, whereas fabrics coated with gelatin-latex increase in weight relatively rapidly when exposed to humid atmospheres.

Fire-resistant doped fabric for aircraft.—Cellulose nitrate dope, now commonly used to cover the fabric on the wings and fuselages of airplanes, is very flammable and its replacement by a less hazardous product is desirable. An airplane covering resistant to ignition was obtained by the application of boric-acid-borax mixture to airplane cloth and subsequently doping it with cellulose acetate.

Pressed boards and paper from cornstalks.—A semicommercial method was developed for disintegrating wet cornstalks into fibers, forming them in a sheet, squeezing out excess water, and drying the sheet as a strong, hard board in a steam-heated press. The drying operation was controlled by measuring the electrical resistance of the hot boards in the press. A semicommercial process was also developed for separating cornstalks into cortex (long fibers), pith, and fines.

Sweetpotato starch sizing for textiles.—Semicommercial studies of various starches at Auburn Polytechnic Institute, supplemented by practical demonstrations in a textile mill, have shown that sweetpotato starch is superior for sizing, slashing, weaving, and finishing cotton yarns and cloth.

Measurement of the acidity of organic and fibrous materials.—With specially devised glass electrodes and electrical apparatus it has been possible to measure the faint acidities of fibers of paper, textiles, soils, etc., to within 0.01 pH unit. In cooperation with the Bureau of Plant Industry colorimetric and electrometric methods have been developed, whereby spores of certain closely related tree diseases can be differentiated with a fair degree of certainty.

METALLURGY

Quality of 1-percent-carbon tool steel.—Steels of this general character often differ decidedly in their inherent response to hardening treatment. A report has been published dealing with the factors controlling this. Correlations were established between the microstructure of the unhardened steel, the austenite grain size

developed on heating, and the critical cooling rate on quenching; that is, the depth of hardening attained.

Steel for engraving plates.—A study was made at the request of the Bureau of Engraving and Printing of the factors which affect the quality of steel used for engraving plates. The effects of plastic deformation, the rate of work-hardening, and the tendencies toward aging have been studied.

Aircraft metals at subzero temperatures.—An investigation is under way of the effects of low temperature on the mechanical properties, particularly impact resistance, of low alloy structural steels, nickel alloys, and light metal alloys of types used in aircraft constructions.

Engineering uses of silver.—Research associates of American silver producers completed a year's survey of the engineering and industrial uses of silver. The three major phases of the work related to the bactericidal properties of silver, use of silver in chemical manufacturing equipment, and the effect of small additions of silver to engineering alloys.

Bridge-cable wire.—Study has been continued of galvanized heat-treated wire which proved unreliable for bridge cables, with emphasis on the structure and on the response to fluctuating stresses. Two important facts established are the presence of occasional internal microscopic cracks and the relatively low endurance of the wire subjected to a condition of combined fluctuating tension and bending, such as obtains if the stressed wire does not snugly fit the cylindrical support.

Screen wire cloth.—Outdoor exposure tests of seven different nonferrous metal insect-screen wire cloths, were terminated after 9 years' continuous exposure in industrial, sea-coastal, and inland locations, and a report published. The serviceability varies greatly with prevailing atmospheric conditions; unalloyed copper and bronze (2 percent tin) were most suitable under severe industrial conditions.

Welding of steel.—Studies have been made of the effects of variations in the welding procedure and of composition of electrode and base metal on the microstructures of electric welds in numerous low-alloy structural steels.

Airplane propeller material.—The effect of various chance imperfections on the endurance properties of steel used in welded hollow propeller blades has been determined by means of endurance tests on specimens machined from the finished blades.

Under-water corrosion of iron and steel.—Investigation of the effect of various factors on the rate of corrosion of iron and steel submerged in water has been continued with emphasis on the following factors: Velocity of water flow, alkalinity of the water, initial surface oxide films, temperature, and dissolved oxygen. The results of large-scale tests on wrought pipes of iron and steel, over a period of a few months, have shown the desirability of a new series of such tests to be continued for a period of years. These have been started.

Weathering of light structural alloys for aircraft.—Supplementing a series of exposure tests of 5 years' duration, another series of

recent alloys and coatings was started in 1933. Periodic tests have been conducted during the past year to determine the change in the strength properties and the relative merits of protective coatings. Aluminum alloys containing magnesium are outstanding in their superior properties. Surface oxidation by anodic electrolytic treatment is by far the best priming treatment for subsequent coatings. A report on the results of exposure tests of 5 years' duration on magnesium alloys has been prepared. Observations are being continued on another series of materials, plain and coated, exposed continuously to the weather.

Protective treatment of aluminum and magnesium alloys.—The value of the anodic oxidation treatment for increasing the life of aluminum alloys in service has been conclusively demonstrated. Methods for increasing the life of the electrolytic baths used in applying the treatment have been studied and a report is in preparation. The possibilities of usefulness of the alloys of magnesium depend largely on the development of methods of efficient protection against corrosion. Methods now in commercial use are far from satisfactory. However, considerable progress has been made in developing an improved electrolytic method of protection.

Spring materials.—In cooperation with the American Society of Mechanical Engineers and the Engineering Foundation, considerable progress has been made in preparation of a comprehensive résumé of properties of spring materials. One chapter has been published and another is about ready for publication. In addition to the fundamental properties of the materials, factors that influence their usefulness as springs are being considered.

Wear of metals.—Previous study has demonstrated the important relationship between the average wear-resistance of carbon steel and of surface oxide films if conditions are favorable to their formation during abrasion. This study has been extended to include hardenable corrosion-resisting chromium steels, the results of which are not entirely consistent with those of plain steel.

Gases in metals.—The amount and character of the gases evolved from steels on melting constitute an important index of their quality. Modification of the apparatus for vacuum fusion has made it possible to reduce by one-half the time required for this laborious determination, without any detectable sacrifice in precision. The adaptation of the general method to the study of alloy steels is under way.

High-purity iron.—The preparation of a small amount of iron of extremely high purity has been completed. The process is now being applied to operations on a larger scale. Twenty-five pounds of iron oxide made from iron nitrate repeatedly recrystallized is now available. The necessary preliminary study of the extensive technical literature on pure iron has formed the basis of a monograph, "The Metal—Iron", which is now being printed.

Oxygen in steel.—The international cooperative laboratory study of this important determination is under way. About half of the 37 cooperators, all using identical materials, have reported their results.

Foundry molding sands.—At the request of the Naval Gun Factory close contact has been maintained with their foundry in the evaluation of the sands purchased under new specifications prepared

to meet their special requirements. A pipette method has been developed for determining the very fine grain material and the bonding clay substance in sands.

Cast iron.—At the request of the American Foundrymen's Association, various casting methods proposed for preparing the transverse bars for testing cast iron have been investigated. The study of the superheating of cast iron has been continued in an endeavor to establish the structural changes responsible for the effect.

Copper-base nonferrous ingot metals.—In cooperation with the Non-Ferrous Ingot Metals Institute the properties of various alloys to serve as types of ingot metals have been investigated. Red brass (Cu 85, Sn 5, Pb 5, Zn 5) and two related types have been studied in detail. This work formed the basis of the American exchange paper to the Institute of British Foundrymen.

CLAY AND SILICATE PRODUCTS

Substitution of American for English china clays.—Work to date has shown that the superior properties of the English clays are apparently due to the presence in English clays of certain natural fluxes that are not found in American clays. These fluxes have been identified and studies are now being made of American clays modified by the addition of fluxes.

Ohio red burning clays.—A report was issued covering the essential properties of 26 Ohio clays used for manufacturing heavy wares. Fineness of grain, base exchange capacity, and iron and lime contents were most important properties at various stages of manufacture.

Glass formation of heat-treated clays.—In all burned clays the strength and certain other physical factors are dependent upon the formation of a glass which acts as a bond. Several typical red burning clays were subjected to various heat treatments and the development of the glassy phase studied. It was found that the minerals giving the deep red colors to wares made from these clays are not present in the original clays, but are artificially produced in the glassy phase as the heated clay cools. Further study of the glasses likely to form in clay bodies shows that, with a fixed silica content, the index of refraction increases with increasing potash content.

Failure of boiler furnace refractories due to slag action.—The life of boiler-plant refractories depends very largely upon the nature of the reaction between the ash of the coal and the refractory. Further work on the alumina-silica-mullite-iron oxide system shows that slags containing more than about 6 percent of fluxes, aside from the 10 percent iron content, are likely to be unduly corrosive of clay refractories.

Physical properties of glass.—The work on this subject was extended to include glasses of the soda-alumina-silica series. Data were obtained showing the relations between the composition and the index of refraction, density, thermal expansion, annealing temperature, and softening point. This supplements an earlier investigation of the glasses of the soda-lime-silica series. The potash-lime-silica glasses are now being studied.

Code for safety glass in automobiles.—The National Bureau of Standards and the National Bureau of Casualty and Surety Underwriters are cosponsors for a code for safety glass for glazing automobiles, under the procedure of the American Standards Association. The code was developed through cooperation with producers and consumers of glass and automobiles and specifies tests for wire glass, heat-treated glass, and laminated glass that should insure the procurement of satisfactory safety glass. It is now being used by a number of States in establishing regulations for safety glass in motor vehicles.

Production of optical glass.—Sixty-five pots of optical glass, embracing four different kinds, were made. From a part of these, over 45,000 molded and annealed blanks for optical elements were made for the Navy Department. The use of a fine-grained, dense-clay stirring thimble has improved the quality of most of the glasses, and the substitution of powdered flint for glass sand results in better lead glasses.

Determination of constituents in portland cement.—The application of metallographic methods to studies of portland cement clinkers is under way. By polishing samples of cement clinker with coarse duck and tin oxide and then etching with either water or certain dilute acids it was found possible to distinguish different compounds in the clinker and to determine their relative amounts.

Cement.—Calorimetric determinations have been made of the heats of hydration of Boulder Dam cements and of partially prehydrated cements cured at different conditions and temperatures. Heats of hydration are being measured on analyzed cement fractions of known particle size distribution. The investigation of the effect of granulometric composition on the properties of pastes, mortars, and concretes was completed and published. Sizes greater than 7 microns were lacking in plastic properties. It was found that the strength of a cement at any age was not a function of the specific surface, but of the degree to which the cement has hydrated.

The investigation of 41 commercial masonry cements of widely different types was completed and the results published in the Journal of Research. The addition of water-repellant materials markedly increased the workability and also the water-retaining properties of cements. Requirements for a masonry-cement specification were formulated, based on the results of the investigation. During the year the Bureau tested approximately 4,400,000 barrels of cement for the various Government agencies.

The Cement Reference Laboratory, a cooperative project of the Bureau and the American Society for Testing Materials nearly completed its fourth tour of inspection among cement laboratories throughout the country, including the inspection of a large number of laboratories at the request of the Bureau of Public Roads.

Pore structure of heavy clay products.—Equipment has been assembled to investigate the pore structure of brick, tile, and other structural clay products to determine the influence of pore structure on the resistance of clay products to disintegration when exposed to weathering conditions.

Vitreous enamels.—At the request of the Porcelain Enamel Institute a standard reflectance test for enamels is being developed. A

tour of inspection of the principal enamel laboratories disclosed a number of sources of discrepancies in the measurements as heretofore made. Reflectance charts have been distributed to cooperating laboratories.

Failure of enameled articles has been found to be induced or facilitated by residual stresses in the enamel coatings. Abnormally high stresses, resulting from large temperature gradients during cooling after firing, persisted when the articles were reheated 2½ hours at 50° C. above the softening temperature of the enamel, but disappeared in 3½ minutes at a temperature 200° C. higher. As a result of this study, manufacturers are being advised in cooling enameled ware to hold it slightly above the softening temperature of the enamel until it has assumed a uniform temperature throughout and then place it in the open air, thus minimizing residual stress.

Building stones.—The study of physical properties of the building and monumental granites has included tests for density, absorption, porosity, compressive strength, and weathering on approximately 100 samples from 17 States. The results have been supplied to the producers and various individuals requesting data on specific materials.

Waterproofing.—Experiments on the durability and effectiveness of surface waterproofing treatments for masonry have been completed and the results published in the Journal of Research.

SIMPLIFIED PRACTICE

Simplified practice recommendations.—A total of 159 simplified practice recommendations have been formally approved, of which 155 are available in printed form. Six simplification projects were completed and prepared for publication, as follows: R151–34, wood-cased lead pencils; R155–34, cans for fruits and vegetables; R156–34, containers for extracted honey; R158–35, forged axes; R159–35, forged hammers; and R160–35, forged hatchets.

Revisions and reaffirmations.—Forty-one existing simplified practice recommendations were reviewed and acted upon by the accredited standing committees of the respective industries. Of these, 34 were reaffirmed without change. All acceptors of record were advised of this action. The remaining seven recommendations were revised, and the industries circularized anew for signed acceptances.

New projects.—Thirty-three proposals for simplified practice recommendations were made. Some of these are quite new, such as bank and security vaults, and packaging of air-brake material: others are earlier proposals which have been reopened by industry, for example, screen sizes of mineral aggregates, and paper towels; while still others await further action by the proponent groups, such as spiral wound brushes, and film for microphotometric duplication of documents. The division, in cooperation with the respective administrators of the National Recovery Administration, and code authorities, assisted several industries in the development of simplification projects.

Approval of simplified lines in trade literature.—Catalogs and trade literature, textbooks, yearbooks, handbooks, and magazines continue to refer to simplified practice and to advocate adherence to specific simplified practice recommendations. Government estab-

lishments—Federal, State, and municipal—are adhering to the recommendations. Colleges and universities continue their interest in simplification as an element of industrial management.

TRADE STANDARDS

Commercial standards.—At the close of the year a total of 51 commercial standards had been accepted by the industries concerned, and 50 were in effect and available in printed form. Additional uncompleted projects for the establishment of commercial standards made a total of 100 active projects of this type of voluntary self-government in industry. During the year, cooperation with the respective industries at their request resulted in the acceptance of commercial standards for binders board, chip board, fuel oil, and marking of silver and gold combinations. Five printed editions of established commercial standards were made available, including the first three mentioned above; domestic burners for Pennsylvania anthracite; and ground-glass joints, stopcocks, and stoppers. Two standards, namely, fiber insulating board and wood shingles, were reaffirmed with minor changes. Nineteen preliminary and four general conferences were held to pave the way for the establishment of standards of quality for cotton garments, asphalt, tile, limestone, men's pajamas, rock drill bits, silver and gold combinations, dress fabrics, curtain and drapery fabrics, full-fashioned hosiery, elastic webs for overalls, mohair plush, and cast stone.

CODES AND SPECIFICATIONS

During the year the Division of Specifications was expanded to include the activities of the building codes and building practices sections of the former Division of Building and Housing, and the safety standards section of the Division of Electricity. In recognition of this expansion its name was changed to Division of Codes and Specifications.

Building and safety codes.—Members of the staff have participated actively in the work of organizing the Building Code Correlating Committee and in the work of the Safety Code Correlating Committee functioning under the auspices of the American Standards Association. Manuscript has been prepared for a revised edition of the "National safety code for the protection of the heads and eyes of industrial workers", and much work has been done on the revised manuscript for the "Safety code for elevators, dumbwaiters and escalators." Manuscript for the "Design and construction of building exits" has been submitted for printing. Elevators in the new Government buildings in Washington have been inspected and tested from the point of view of safety and to determine compliance or lack of compliance with specification requirements.

Definite service has been rendered, on specific request, to several Federal agencies, a few State agencies, and many municipal governments in the preparation or revision of their building, plumbing, and other codes. Surveys were made of the building and plumbing codes in use in America. The results of these surveys were set forth in two letter circulars.

Building materials and structures.—Consulting building erection and maintenance services have been rendered to numerous tax-supported agencies, including the following: Division of Subsistence Homesteads, Interior Department; Federal Emergency Administration of Public Works; Federal Emergency Relief Administration; Federal Housing Administration; Home Owners' Loan Corporation; National Park Service; National Resources Board; Public Works Administration, housing division; and Tennessee Valley Authority.

The following material was issued: Standards and specifications for building materials; lists of publications and articles relating to home heating; publications relating to building codes and construction practice—home building and maintenance; list of published material relating to home building and maintenance; house plan services; and proposed coordination of sizes of building materials.

Facilitating the use of specifications.—The lists of sources of supply of commodities have been augmented by over 2,000 separate requests for listing from manufacturers willing to certify to compliance with 97 Federal specifications and 6 commercial standards, thereby increasing the total number of lists to 486 and the requests to more than 18,000. All of the completed lists have been brought up to date so that they may be used effectively in connection with the Index of Federal Specifications issued as a part of the Federal Standard Stock Catalog.

Special services to governmental and nongovernmental agencies.—In compliance with a request from the Procurement Division, Treasury Department, the manuscript for the Directory of Federal Government Testing Laboratories was revised completely, on the basis of returns from questionnaires submitted to all interested Federal agencies. The Procurement Division has cooperated in the undertaking by compiling the manuscript for a directory of Federal inspection services. These two directories will be issued as a single publication.

Manuscript for a revised edition of the "Directory of commercial testing and college research laboratories" was placed in final form for printing.

All of the proposed codes of fair competition were reviewed for the Consumers' Advisory Board to insure the insertion therein of proper references to quality standards to safeguard the consumers' interest. A survey of the 557 codes that received official approval showed that definite references were made in 223 to existing standards or the creation of committees to formulate standards. Of the 69 references in these codes to Governmental agencies 46 are to the standards or standardization services of the Bureau.

Other agencies to which special services were rendered were the following:

American Civic Association, in a study of the need for coordination of the activities of Federal and non-Federal housing agencies; Building Officials Conference of Virginia, in regard to the inspection of buildings for structural weakness; National Association of Purchasing Agents, in a study of the application of specifications to governmental, educational, and institutional buying; New York City Housing Authority, in arranging an exhibit showing the activities of

the Bureau with relation to materials used in dwelling-house construction and illustrating the numerous services of the Bureau to the building industry; and New York State Governmental Purchasing Agents Association and New York State Conference of Mayors, in a study of the use of specifications by tax-supported agencies.

GENERAL FINANCIAL STATEMENT

The amounts and objects of each appropriation for the past fiscal year, together with disbursements, liabilities, and balance for each appropriation, are shown in the following table:

Disbursements, liabilities, etc., 1935, 1934, and 1933 appropriations

Appropriations	Total appropriation [1]	Disbursements	Liabilities	Balance
1935				
Salaries	$629,836.43	$626,213.73		$3,622.70
Equipment	50,000.00	45,025.92	$4,618.42	355.66
General expenses	[2] 45,163.19	41,681.27	3,271.49	210.43
Improvement and care of grounds	7,267.00	7,091.10	151.23	24.67
Testing structural materials	[3] 244,856.01	233,361.64	6,882.37	4,612.00
Testing machines	[4] 29,129.38	28,531.93	201.87	395.58
Metallurgical research	[5] 31,787.58	31,368.30	237.49	181.79
Investigation of optical glass	14,884.00	14,688.46		195.54
Standard materials	6,153.00	5,834.65	315.84	2.51
Investigation of textiles	[6] 39,912.11	39,186.86		725.25
Sugar standardization	[7] 51,787.34	51,031.49	485.18	270.67
Gage standardization	[8] 31,567.43	30,188.25	645.22	733.96
High temperature investigation	4,873.00	4,856.76		16.24
Testing railroad-track, mine, and other scales	32,720.00	31,244.62	463.84	1,011.54
Investigation of fire-resisting properties	18,395.00	18,197.21	66.75	131.04
Testing miscellaneous materials	25,738.37	25,266.65	115.15	356.57
Investigation of public-utility standards	[9] 62,208.52	60,417.22	838.72	952.58
Radio research	46,450.00	44,178.04	1,449.29	822.67
Industrial research	[10] 55,858.09	54,509.86	702.91	645.32
Sound investigation	[11] 6,184.92	6,172.85		12.07
Investigation of clay products	25,627.00	24,849.31	639.51	138.18
Color standardization	7,768.00	7,581.79	90.34	95.87
Investigation of radioactive substances and X-rays	14,972.00	14,759.26	127.66	85.08
Standardization of mechanical appliances	[12] 27,031.13	26,798.75	59.96	172.42
Standardization of equipment	[13] 79,683.58	77,881.44	876.22	925.92
Investigation of automotive engines	[14] 35,002.00	34,345.82	499.64	156.54
Utilization of waste products from the land	26,589.00	26,322.77	26.35	239.88
Investigation of dental materials	4,459.00	3,629.32	580.00	249.68
Hydraulic laboratory research	[15] 28,483.00	28,238.83	2.78	241.39
Appropriations transferred from other departments which are available for the current year:				
Air navigation facilities	20,454.42	19,966.70	404.75	82.97
California Pacific International Exposition 1935-36	200.00			200.00
Appropriations transferred from other departments under the provision of the Legislative Act approved June 30, 1932: Working fund	281,705.66	257,096.77	4,597.16	20,011.73
Total, 1935	1,986,746.16	1,920,517.57	28,350.14	[16] 37,878.45
Total, 1934	2,545,168.10	1,833,989.53	386.44	[17] 710,792.13
Total, 1933	2,714,805.80	2,416,526.91		298,278.89

[1] Includes reimbursements received and pending, and transfer from other departments as shown under following footnotes, also restoration of salary reduction, $88,274.09.

[2] $1,163.19.
[3] $110,911.33
[4] $927.63.
[5] $165.58.
[6] $7,966.11.
[7] $5,000.
[8] $5,702.43.
[9] $12,999.17.
[10] $3,735.75.
[11] $674.92.
[12] $1,253.13.
[13] $162.
[14] $11,189.50.
[15] $600.

[13] Also transferred to Procurement Division, Treasury Department, $8,100.

[16] Includes savings of $7,500.

[17] Includes, in addition to unobligated balances, impounded amounts and administrative savings of $691,922.

BUREAU OF FISHERIES

The fishery industry has not shown improvement in recent years to the extent apparent in several other food industries. In fact, during the fiscal year 1935 the fishery industry lost some of the gains which were made during the previous fiscal year. This has been especially true with the fishermen and distributors of so-called "market" fishes. Included in this category are such fishes as haddock, mackerel, halibut, mullet, red snappers, lake herring, and others. As a rule, these fishes are marketed in the fresh and frozen condition. Partial reports from the principal ports indicate a larger quantity of some of these fishes have entered the market during the past year, but the prices received by the fishermen have been less. By far the greater number of our fishermen are engaged in catching market fishes and in many instances these fishermen are unorganized.

During the past fiscal year some improvement has been noted among fishermen catching and selling "cannery" fishes, such as salmon, pilchards (sardines), Pacific coast mackerel, tunas, and others. This may be due to better organization among these fishermen as well as to the fact that canned fish is finding a better demand among consumers. Improvement among the sardine, Alaska herring, and menhaden fishermen, no doubt, has been due to a recent act of Congress, which has brought about a brisk demand in this country for domestically produced fish oils.

The fisheries of the United States and Alaska are prosecuted on the high seas and in the territorial waters of the Atlantic and Pacific Oceans and in the Gulf of Mexico and their adjacent waters, as well as in the Great Lakes and other interior waters. Available data for 1933, when the most recent detailed catch surveys were made, indicate an appreciable increase in both the volume and the value of the catch as compared with the previous year. Statistics of the catch in the New England, Middle Atlantic, Chesapeake, and Pacific States, and Alaska were collected for 1933, and when considering the combined catch of these sections alone an increase of 13 percent in the volume and also 13 percent in the value of the catch in 1933 is indicated as compared with the same sections in the previous year.

Based on the most recent surveys, our commercial fisheries gave employment to about 118,000 fishermen, and their catch aggregated 2,899,908,000 pounds, valued at $60,218,000. There were increases in most of the groups of prepared products. The output of canned products amounted to 533,212,000 pounds, valued at $59,800,000, representing an increase of 28 percent in volume and 37 percent in value as compared with 1932; the output of fishery byproducts was valued at $17,466,000, representing an increase of 40 percent; and the production of frozen fishery products amounted to 95,874,000 pounds,

estimated to be valued at $8,000,000, representing an increase of 4 percent in quantity and 14 percent in the estimated value. The output of fresh and frozen packaged fish and shellfish amounted to 129,608,000 pounds, valued at $17,294,000, and cured fish, 104,310,000 pounds, valued at $12,823,000. It is estimated that about 500,000,000 pounds of fresh fishery products (excluding packaged fish and shellfish), valued at about $40,000,000, were marketed during 1933. The total marketed value to domestic primary handlers of all fishery products in 1933 is estimated at about $155,000,000.

Imports of fishery products for consumption in the calendar year 1933 were valued at $30,462,000, which is 3 percent more than in the previous year, while exports of fishery products were valued at $8,339,000, or 7 percent more than in 1932.

FISHERY ADVISORY COMMITTEE

During the year the Secretary of Commerce appointed a Fishery Advisory Committee, representing various branches of the fishing industry, various geographical sections of the country, and related interests including science, medicine, and transportation, for the purpose of considering fishery problems from a national standpoint and offering recommendations for promotion and development.

The first meeting was held on May 6 under the chairmanship of Bernarr MacFadden and various subcommittees were appointed to give detailed study and to later report on specific fields. Committees were appointed on the protection of migratory fish, on game fish, on the relation of the fisheries to other water uses, and on scientific research. Committees were also appointed on food standards, on marketing and distribution, on international trade, and on education and publicity. All of these committees presented preliminary reports and drafted a program of future activities to be the subject of reports at the fall meeting in 1935.

EFFECTUATING A BETTER RELATIONSHIP BETWEEN COMMERCIAL AND SPORT FISHERMEN

From time to time considerable animosity has existed between commercial and sport fishermen. At times the sport fishermen have accused the commercial fishermen of depleting certain fisheries while, on the other hand, the commercial fishermen have censured the sport fishermen for trying to take away their means of livelihood. This, no doubt, has led to the enactment of some legislation parading under the guise of "conservation", which in some cases has resulted only in transferring the fishery problems from the hands of one group to another. For this reason there is a need for greater amity between these two groups, to the end that our great natural fishery resources will be prosecuted wisely. It is important that both groups give coordinated consideration to measures intended to sustain our fish supply. During the past year headway was made in this direction.

Members of the National Fishery Code Authority, representing the commercial fisheries, met with members of the National Planning Council of State Fish and Game Commissioners at the council's meeting at Montreal in September 1934. At this meeting various common problems facing the fisheries were discussed and the ground-

work laid for further cooperation in effectuating the conservation and sustained production of our fishery resources.

A local meeting similar to the above was held in Baltimore early in 1935 which was attended by commercial fishermen and anglers from the Chesapeake Bay section. Here various measures were discussed which were directly connected with the activities of these groups, and the discussion resulted in the meeting sponsoring fishery legislation of benefit to all concerned. Other such meetings have been held in various other sections of the country.

COOPERATION WITH STATES AND EDUCATIONAL INSTITUTIONS

For many years the Bureau has had valuable informal cooperation in fishery investigations with many institutions, both public and private, but the acceptance of formal cooperation was not authorized until the passage of the act of Congress approved May 21, 1930.

In connection with fish-cultural operations the closer cooperative relations with the States as initiated and developed by the National Planning Council of Commercial and Game Fish Commissioners has been unusually effective. During the past year developments of this nature have been largely a consolidation of cooperative procedure and a refinement in the working details of the various cooperative arrangements existing with a majority of the States. Arrangements have been made for several additional States, particularly Iowa, to review Federal applications for fish. The State of Vermont has afforded generous help in a financial way in meeting the costs of operation at the extensive brook-trout egg-producing plant maintained by the Bureau in the White Mountain National Forest, N. H. Tennessee and West Virginia have furnished food for fish held at the Bureau's hatcheries and have handled the distribution of these fish when they were ready for release. A number of the Western States have continued to supply helpful cooperation in the collection of trout eggs and are compensated therefor by receiving a proportion of the eggs taken. There has been a joint operation of trout and shad hatcheries in the State of South Carolina.

Many of the cooperative fish-cultural arrangements are largely a matter of administrative detail and are too voluminous for a full recital, but their effects have been plainly evident in a greater efficiency. In fact, it may be said that in several instances State and Federal fish-cultural facilities are practically interchangeable as far as stocking is concerned, and real distinction lies only in their being administered by different agencies.

California has continued its cooperative scientific investigations with the Bureau concerned with the trout supply, looking toward the more adequate supply of streams and the more rational regulation of fishing within its borders. New York State has continued its cooperation in the conduct of studies of the nutritional requirements of trout to improve hatchery practices in feeding and rearing. Oregon has cooperated with a Bureau investigator in a study of fish diseases and hatchery practices. North Carolina, Connecticut, and Washington have assisted in investigations for the restoration of oyster beds in their coastal waters; and Georgia, Louisiana, and Texas have taken an active part in the study of the important shell fisheries of the South Atlantic and Gulf coasts. Despite the fact

that State budgets have been reduced proportional to Federal budgets for these projects, this cooperation has been very effective and is greatly appreciated.

Another source of most valuable cooperation is provided by educational institutions, chiefly State universities. Laboratory quarters for the Bureau's investigative staffs are provided by Harvard University as headquarters for North and Middle Atlantic fishery investigations. University of Michigan has headquarters for the Great Lakes fishery investigations, University of Utah for fishery investigations in the intermountain section, University of Missouri for investigation of interior waters, and Stanford University for California trout investigations. The Wisconsin Natural History Geologic Survey has cooperated with the Bureau in many ways. Yale University, Cornell University, the University of Washington, and the Oregon State Agricultural College have likewise provided quarters or others facilities for investigative work.

In the technological work of the Bureau many State agencies have cooperated in extending their facilities for the prosecution of these studies. State universities, hospitals, agricultural experiment stations, and other State institutions of research have contributed personnel and laboratories in various projects. Among the institutions represented in this work during the past year were the South Carolina Food Research Commission and State Medical College, the Massachusetts State Agricultural College, the New York State College of Agriculture, Washington State College and Agricultural Experiment Station, the University of Washington, George Washington University, and the University of Maryland.

The value of this type of cooperation in the scientific fields cannot be overestimated. The Bureau's investigators receive, in addition to actual laboratory and office quarters, the use of university libraries, advice and assistance from the university faculties, and many other courtesies which stimulate a community of interest in technical problems of the fisheries. The universities thus contribute to research of practical value and application to their own communities, and their graduate students receive stimulation and advice in research problems similar to those of the Bureau and frequently part-time or temporary employment in Bureau projects, all of which contributes to the progress of aquatic biology and technology in the United States.

In the Bureau's statistical research of the fisheries of the Great Lakes and Pacific Coast States and of the States of Maryland and Virginia such exceptional cooperation has been obtained from State fishery agencies in recent years that the Bureau has conducted only limited surveys to supplement the data available from the States.

COOPERATION WITH OTHER FEDERAL AGENCIES

The Bureau's program has always been closely correlated with work of the various Bureaus of the Department of Commerce, from which it secures assistance of various kinds, chiefly relating to the promotive aspects of commercial fishery investigations.

At the close of the year plans were being developed for one project in North Carolina whereby a hatchery would be constructed and turned over to the Bureau for subsequent operation, with the object of providing fish for the surrounding territory.

The Bureau has been called on to make a survey in the Tennessee Valley to aid the Tennessee Valley Authority in developing a program of conserving fishery resources and establishing a hatchery system.

The United States Army Engineers have given sympathetic consideration to the Bureau's recommendations, with regard to developments in the upper Mississippi River area. This has been based upon a hope that the dams comprising part of the 9-foot channel development might be modified so as to provide extensive propagating ponds for the production of fish native to that area. In connection with the work on the Bonneville Dam (later discussed in more detail) the War Department allotted funds from its construction appropriations that the Bureau might carry on studies and design ways for passing the run of salmon over this new dam.

Through the cooperation of the Navy Department the annual supplies for the Pribilof Islands were forwarded from Seattle on the U. S. S. *Sirius*, and the season's take of sealskins was brought out by this vessel on its return voyage. The United States Coast Guard also rendered valuable assistance in maintaining a patrol for the protection of the fur seals and in performing other services.

The nature of the work performed by the National Park Service, Forest Service, the Office of Indian Affairs, the Bureau of Reclamation, and the Bureau of Biological Survey gives them of necessity an interest in the Bureau's fish-cultural work. The stocking of streams and lakes under the control of the foregoing agencies was an important feature of their administration. Consequently, it has been necessary to maintain closer contact with these establishments, and it is felt that the Bureau has been of real service in numerous instances.

While these cooperative relationships are of a more or less standing nature, there have been contacts with the newer emergency organizations which offer prospects of mutual value. The Agricultural Adjustment Administration, insofar as its work covers the utilization of marginal lands, has called on the Bureau in several instances to plan a program for fish propagation and the provision of angling.

Various members of the Division of Fishery Industries assisted other Federal agencies in the conduct of technological and economic studies relative to the fishery industry. In this connection special aid was rendered the National Recovery Administration in the development of fishery codes, a member of the Bureau being on detail to that Administration until October 1, 1934, to supervise and assist in this work; the Department of Agriculture, in various nutrition studies; the Federal Emergency Relief Administration, in fishery relief projects; the Federal Surplus Relief Corporation, in supplying data on the fishery food situation; and the Reconstruction Finance Corporation, on loans to the fishery industry. One member of the Bureau has been appointed a member of the food survey committee of the Departent of Agriculture, which investigates the supply and price situation of surplus foods.

The Bureau has had the cooperation of the Bureau of Agricultural Economics in the collection of statistics on the volume of cold-storage holdings of fish; and the cooperation of the health authorities in Washington, D. C., in obtaining the volume of fish handled at the Municipal Fish Wharf and Market in this city. In another instance the Bureau obtained figures on the volume of the quarterly holdings of fish oils for the Bureau of the Census.

CONSTRUCTION ACTIVITIES

At the start of the year there were small unexpended balances in approximately 12 allotments for the repair and reconditioning of fish hatcheries. These allotments had been made by the Public Works Administration during the previous year, and the work was carried to a conclusion during the fiscal year 1935.

A considerable portion of a similar allotment for the continued development of the Leetown (W. Va.) experimental hatchery remained available and was expended in part for the construction of bass and trout ponds, remodeling of one of the buildings, and construction of a new dwelling.

Early in the year a new Public Works allotment of $75,000 was received for the construction of a pond-fish hatchery at Harrison Lake, Va., 26 miles southeast of Richmond. Work was started during the winter and at the close of the year approximately 15 acres of ponds were virtually completed and other developments were well along to the point where the establishment could go into active operation during the fall of 1935. Arrangements were being made for the propagation of shad as well as pond fish at this point. Two dwellings as well as various service buildings comprised the structural improvements. The water supply, which is obtained from a lake, is fed through a canal.

In general, the construction and improvements effected during the fiscal years 1934 and 1935 can be credited in part for the increased hatchery output attained during the latter year.

CONSERVATION OF WHALES

The Multilateral Convention for the Regulation of Whaling agreed to by the economic committee of the Council of the League of Nations on September 24, 1931, became effective on January 16, 1935, in consequence of the deposit of the ratification of the convention by Great Britain and Northern Ireland on October 18, 1934. The convention was ratified by other nations as follows: United States, July 7, 1932; Norway, July 18, 1932; Union of South Africa, January 11, 1933; Switzerland, February 16, 1933; and Mexico, March 13, 1933. In addition to these ratifications, the following have signified adherence to the convention: Nicaragua on April 30, 1932; Sudan, April 13, 1932; Monaco, June 17, 1932; Brazil, November 21, 1932; and Egypt, January 25, 1933.

A bill has been introduced in Congress to give effect to the convention.

BIOLOGICAL FISHERY INVESTIGATIONS

The major portion of the research looking toward the conservation of the fishery resources of the United States is conducted by the Division of Scientific Inquiry. Some of the States maintain research stations and laboratories and some a single fishery biologist, but as a general rule the State governments do not conduct fishery research on any considerable scale. Many, however, contribute or cooperate effectively in scientific work conducted by the Bureau as has been mentioned previously. This cooperation should be developed and extended.

Research activities are about equally divided among three important fields. These are (1) aquicultural investigations including studies on the improvement of hatchery technique for both cold and warm water fishes and the planning of rational stocking policies in interior waters, (2) commercial fishery investigations concerned with the changes in abundance of the food fishes of the coastal areas and the Great Lakes, the detection of overfishing, and the correction of abuses in the commercial fisheries, and (3) shell-fishery investigations directed toward improving the quality of oysters, increasing production by cultural methods and combating oyster pests.

The technical staff of the Division of Scientific Inquiry numbers 45 trained experts, with perhaps an equal number of temporary assistants at some times of the year, but the problems of the fisheries are as numerous as the species that are exploited. Some 30 important food and game fishes are the subjects of continuing research, but to give adequate attention to the fisheries in all sections of the United States—coastal, interior, and in Alaska—would require double the number of present investigators.

AQUICULTURAL INVESTIGATIONS

The problems of the fresh-water fisheries throughout the country at present are concerned chiefly with increasing hatchery output and properly stocking interior waters. In carrying out the latter program, the discovery of suitable natural conditions by means of stream surveys, the conditioning of streams to improve their fish carrying capacity, and the control of stream pollution are vital to its success.

Pond-fish culture.—Investigations in pond-fish culture were conducted during the past year at the Natchitoches (La.) fish hatchery. These investigations were designed primarily to throw light on the problems which have arisen in connection with pond culture in the Southern States where conditions in many respects are quite different from those found in hatcheries in the North. Experiments during 1934, designed primarily to furnish a comparison of the value of different fertilizers show that cottonseed meal and other fertilizers are beneficial in producing a large crop of forage organisms on which the fish feed, but that food production alone is not directly correlated with fish production. In heavily fertilized ponds large numbers of small fish may be produced for early distribution, but additional forage food is required to carry the bass through the summer until October or November.

Trout culture.—Trout cultural investigations have been conducted at the experimental hatcheries located at Pittsford, Vt., and Leetown, W. Va. Here experiments were designed to determine the most economical ration for the feeding of both fingerling and older trout. Detailed observations were made on the food requirements of fish of the same species at different ages and of the different species of trout as a guide to more economical general hatchery practices. Selective breeding experiments have also been conducted at these two stations to secure a superior strain from the point of view of growth, egg production, and disease resistance. Future brood stock was selected from fish of known lineage for propagation of future supplies.

Fish nutrition.—At the United States Fishery Station, Cortland, N. Y., cooperative investigations of fundamental problems of trout

nutrition, which have been under way for several years with the State of New York, Cornell University, and the Bureau, have been continued. As a result of these investigations, improved trout diets have been devised and numerous problems regarding the digestibility of food materials have been solved that should aid in reducing cost of hatchery operations throughout the country. Similar study of hatchery and stocking problems have been undertaken on a cooperative basis in California, concerned primarily with problems of managing the supply of steelhead trout in coastal streams and of the various trout species in the high mountain regions.

Fish pathology.—Progress has been made during the year in the study of fish diseases that annually take heavy toll of the fish in hatcheries. Experiments on two of them, the so-called "ulcer disease" and "blue sac disease", have been made in an effort to find preventives or cures, and a clinic or disease service has been established to aid fish culturists in their practical problems of disease prevention. In this service prompt diagnosis of diseases is given by mail when fishes are sent to the laboratory for examination.

Stream surveys.—Utilizing funds provided by the Public Works, stream surveys were conducted by 16 parties operating in forests and parks in various parts of the country. The primary purpose of the surveys was to provide an inventory of conditions that affect the fish population in each lake and stream. With this information at hand, it has been possible to determine to what species of fish each body of water is best adapted and the number it can support most advantageously. One-sixth of the waters of our national forests have been surveyed during the past year, with the result that many miles of water formerly stocked have been shown to be worthless and in some localities suitable waters are neglected. Greater economy and efficiency can, therefore, be introduced into the stocking program.

In connection with the stream surveys, extensive work in stream improvement was carried out in the national forests for the purpose of increasing the carrying capacity and food production in streams. Since there are few reliable data on which to base an estimate of the true value of stream improvement, the work was primarily experimental, and its real result will be apparent only after several years.

Pollution of waters.—One of the most serious limitations on the maintenance of abundant stocks of food and game fishes in interior waters and the chief hindrance in stocking these waters with additional supplies is pollution from domestic and industrial sources. The destruction of fish life by polluting substances, already acute in many localities, is rapidly growing throughout the more densely settled and industrialized sections of the country.

Without authority, until the passage of the "Coordination Act" March 10, 1934, the Bureau has made during the past year, with an allotment of funds from the Public Works Administration, a very promising start on an investigation of pollution problems related to the conservation of aquatic life. The standards of water purities for the protection of aquatic life differ from those applying to industrial uses of water or for the protection of public health, and are to a certain degree more exacting.

Lacking suitable standards for the evaluation of polluted streams as fish habitats, research has been directed during the past year to a detailed study of the physiological effects of various polluting substances and the establishment of standards of purity for the maintenance of an abundant fish fauna. A manuscript has been completed for publication that establishes these minimum standards for fish as a guide to efforts at stream-pollution abatement.

In addition to the laboratory studies involved in this work detailed surveys of actual conditions in the stream inimical to fish life because of pollution have been made in widely scattered areas throughout the Mississippi drainage.

COMMERCIAL FISHERY INVESTIGATIONS

Although the total yield of the commercial fisheries in the United States has been maintained, and even increased during the past quarter of a century, many of the important commercial species are undergoing progressive depletion. The Bureau's investigations of commercial fisheries are organized, therefore, as continuing observations of the condition and trend of the important commercial fisheries, rather than as disconnected and temporary inquiries or surveys. Their purpose is to trace from year to year variations in the supply of food fishes resulting from natural causes, the early detection of the first signs of serious depletion, and the recommendation of legislation or control of fishing operations and the correction of abuses to maintain the fisheries on the basis of sustained yield. Such investigations are the sole guide to wise conservation policies.

Haddock.—In the North and Middle Atlantic sections biological and statistical studies have been continued on the fisheries for haddock, mackerel, squeteague, scup, and other shore fishes from the offshore Nova Scotian banks to North Carolina. Chief attention has been given to measuring accurately the fluctuations in the supply of haddock available for fishermen. This catch analysis shows that the haddock population on the principal northeast banks was at a low level of abundance in 1935. In fact, marketable haddock were not more than one-third as abundant as during the period 1926–28. As a result of this scarcity, the United States fleet is now forced to fish on banks off the Nova Scotian coast, a distance upward of 600 miles from their home ports. Numerous biological data on age composition, growth rates, and mass movements of the haddock population indicate that the scarcity is due to intensive commercial fishing which is removing haddock from the sea at a more rapid rate than natural replacement by reproduction and growth. One of the causes of this scarcity is the loss of large quantities of undersized and immature fish destroyed in the course of regular trawling operations.

Mackerel.—Mackerel investigations have been designed to discover the best possible use of the fluctuating supply that nature provides. One means is to protect the future abundance of mackerel so that the industry may adjust itself to the expected supply, and the other is to find out if possible whether a more stable and more valuable supply of large mackerel would result from reducing the intensity of fishing on the young. Predictions of the general abundance of mackerel in advance of each season have been made

annually for some years. During the fiscal year 1935 predictions for the previous season were checked by analyzing catch statistics to note the effect of the curtailment program of the industry under the code of fair competition. Results of the check indicate that the prediction of abundance was correct within 10 percent. A prediction for the 1935 season was prepared in May of the current year. The rate of catching mackerel in the early part of the season was entirely in accord with the prediction which anticipated an unusually heavy run during the early months. Extensive biological observations on the life history of the mackerel have been continued and a comprehensive report that will guide future conservation policies is in the process of preparation.

Shore fish of the Middle Atlantic States.—Further observations have been made regarding the state of the supply of the squeteague, scup, sea bass, flounders, and minor species taken in great quantities in the inshore regions from Cape Cod to North Carolina. Further details of the life history and migrations of the most important species, the squeteague or weakfish, perfect our understanding on the relationship between the centers of production in the southern portion of the range and the yield of the fisheries in New Jersey and New York. Fully one-half of the total supply taken north of Delaware Bay is derived from spawning in southern waters. Conservation, therefore, must be promoted by regulating the strain of exploitation from Chesapeake Bay southward, rather than by drastic restriction of the catch in northern waters.

Regulation of the New Jersey shore fishery is complicated by the rapid development of the offshore trawl fishery of Virginia. The catch of this important branch of the industry has been shown to depend not only on the abundance of fish but on the degree of availability which is affected by changes in water temperatures. Wastage of immature fish in southern waters constitutes a heavy drain upon the supply. Depletion has not yet been demonstrated, although its possibility as a result of severe exploitation in the shore areas in the summer and the offshore areas in the winter is clearly recognized.

Shrimp investigations in the South Atlantic and Gulf States.—Landings of shrimp, the most important fishery in the South Atlantic and Gulf States, have declined since 1930. No evidence has been secured of the depletion of the supply in the Gulf area, but on the South Atlantic coast great fears are felt for the future of the fisheries.

Previous investigations have outlined in some detail the life history and development of the most important species of shrimp. During the past year chief attention has been given to a study of mass movements of this species, since local variations in supply, particularly on the Atlantic coast, are very evident. Efforts are being made to trace the movements of the shrimp by the changing composition of populations and by direct tagging experiments. Tagging, however, is a difficult process and considerable attention has been given to the perfecting of a technique for this purpose. It is suspected that a considerable supply of shrimp may exist in offshore waters during the winter period, but the lack of a suitable research vessel prevents an immediate attempt to survey offshore fishing grounds or to follow shrimp migrations.

Great Lakes fisheries.—Owing to the continued curtailment of the budget, no field work was conducted on the Great Lakes during the past year. The staff, however, has been engaged in analyzing material gained in previous years' observations and in assisting in legislative matters with the States.

The most urgent need in this region today is concerned with uniform regulations of commercial fishing. Many attempts in the past have failed to secure coordinated legislation among the States, but progress in improving conservation laws has resulted from many conferences during the past year.

An intensive statistical study of the commercial fisheries in Great Lakes waters of the State of Michigan has been continued. These studies, based on detailed records secured by the State Conservation Department, demonstrate the rapid depletion of whitefish supply by deep trap nets, and the statistical evidence of their destructive action was directly instrumental in securing legislation regulating and restricting the use of this gear.

A study of the life history of the important commercial species of the pike perches is nearing completion, and similar studies of the yellow perch were pursued.

Pacific coast fishery investigations.—One of the most important undertakings of the Division of Scientific Inquiry is a comprehensive program of investigation of the salmon fisheries of the Columbia River, begun in July 1934. The aims of this investigation are:

1. To provide for rational regulation of a commercial fishery in the lower Columbia in order to permit an adequate escapment of fish for spawning purposes.
2. To assure free passage of spawning migrations over the various dams in the Columbia River.
3. To provide for increased spawning in the upper tributaries by removing all unnecessary obstructions and by rehabilitating spawning grounds formerly productive.
4. To improve artificial propagation of salmon and to increase production by reestablishing runs in suitable tributaries.
5. To improve survival by reducing the pollution hazards.
6. To prevent loss of downstream migrants in unscreened irrigation diversions.

A complete survey of the river system has been undertaken in order to assess these various problems, including a detailed analysis of the commercial catch from earliest times to the present. Detailed recommendations were offered by the Bureau to the War Department for the construction of fish protective works at Bonneville Dam including four gravity fish ladders of an improved type and three fish locks or hydraulic lifts for conveying spawning fish over the dam, and a series of fingerling bypasses to protect downstream migrants; $3,200,000 has been allotted for this construction and although the problems of fish protection are by no means solved, the Bureau is confident that effective protection of the Columbia River salmon runs at this point will be afforded.

With an allotment from the Public Works Administration, the Bureau has constructed screens for three important diversions on the Yakima River for the protection of young salmon from loss in irrigation canals of the Reclamation Service. Two additional screens were constructed on other watersheds for a similar purpose.

The studies recently undertaken on the salmon fisheries of Puget Sound have also been continued with special attention given to the sockeye and coho salmon fisheries. Details of the life history of these fishes have been studied as a basis for future protection, and a statistical analysis of the sockeye salmon fishery of the Frazer River area was made which demonstrates the severe depletion of this important stock of fish and emphasizes the need for international regulation of the fishery.

Studies have been continued on the two most important species of salmon in Alaska, namely, the red salmon and the pink salmon. Studies of the red salmon of Karluk River system, which require continued observations for many years, were conducted during the past year for the purpose of determining production from known escapements of spawning fish. Records for eight generations are now available, showing wide variations in production, varying from a ratio of return to escapement from 0.6 to 1 to 5.6 to 1. There seems to be little possibility of regulating spawning escapement so as to produce consistently a large population. Hence, efforts are being directed to the determining of factors which determine survival in order to control natural forces and to regulate the fishery in the interest of conservation.

Similar studies of the changing abundance of pink salmon have also been continued in southeastern Alaska. Results of this study show that wide fluctuations may be expected in the yearly abundance of this species. Studies of the effect of rainfall and stream flow, as it affects spawning conditions, and population density in the sea, affecting rate of growth and time of migration, hold the key to better regulation of the fishery.

Further studies have been pursued of the depletion of the herring in limited areas in Alaska, with a view to determining the units of population that make up the herring supply. Supplementing biostatistical analyses of the races of herring, large-scale tagging experiments have been undertaken to trace the migrations and to find the limits of movement of the various stocks. Recovery of tags has been facilitated by the perfection of an electric device for detecting tagged fish in commercial catches. Detailed records of actual migrations are now being secured to guide the drafting of more effective fishery regulations.

SHELL-FISHERIES INVESTIGATIONS

Investigation of the various problems relating to oyster culture were carried out in all the principal centers of the industry of the Atlantic and Pacific Coastal States and the Gulf of Mexico. The work was expanded by an experimental study of the effects of oil pollution in Louisiana waters, which demonstrates the dangers to aquatic life of the development of petroleum supplies in coastal waters.

In the New England area the larger part of the work was a continuation of the investigation of the growth and fattening of oysters started by the Bureau in the spring of 1932. The effects of water temperature and varying amounts of various chemical constituents of sea water were studied in relation to nutrition of oysters and the storing of glycogen or animal starch. These studies are funda-

mental to practical methods of improving the quality of market oysters through artificial feeding or the control or selection of the environment.

A number of investigations and surveys were conducted in the South Atlantic States with a view to rehabilitating public oyster beds in North Carolia and Florida, and studies on the cultivation of the native Olympia oyster in Puget Sound were continued. A practical result of this latter undertaking has been the prediction of the precise time of setting of oyster larva in Puget Sound, enabling the oystermen to regulate their planting activities so as to secure a maximum set of seed oysters.

In order to answer many requests regarding the cultivation of hard clams, a minor research project was undertaken on the life history of this valuable shellfish. Much information has been secured in Long Island Sound regarding its life history, habits, and physiology, as a basis for developing practical methods of propagation.

Oyster pest control.—Near the end of the year a special appropriation of $100,000 became available for a study of means of controlling various pests of the oyster that have reached epidemic proportions, menacing the existence of cultivated and natural beds. A staff of competent investigators was recruited and headquarters were established at Milford, Conn., to study means of controlling the depredations of starfish; at Bivalve, N. J., and Beaufort, N. C., for the control of the drill, which is the most important oyster enemy in the Middle Atlantic section; and at Apalachicola, Fla., for combating the leech, a flat worm which has recently become extremely destructive of valuable oyster supplies in Florida. The steamship *Kittery* was transferred from the Shipping Board, without exhange of funds, to the Federal Emergency Relief Administration for use in the drill control work in the vicinity of Norfolk, Va. This investigation will continue throughout the next fiscal year with the hope of demonstrating practicable methods that can be applied on a large scale by the Federal or State Governments and by private oyster planters in controlling the most important enemies of the oyster industry.

ALASKA FISHERIES SERVICE

ADMINISTRATION OF FISHERY LAWS AND REGULATIONS

The control of commercial fishing in Alaska was administered as usual in accordance with general laws and regulations for the conservation of the fisheries. A consistent program has been followed, the main object of which is to assure an adequate escapement of brood fish to maintain a maximum supply. A breeding reserve of 50 percent of the salmon runs is regarded as the minimum requirement. Careful observations of the runs are made each season, and when signs of depletion are evident in any locality appropriate remedial measures are initiated.

An unusual abundance of salmon in practically all areas characterized the 1934 season, and few additional restrictions on commercial operations were imposed. In some instances existing restrictions were relaxed as the season advanced. Revised regulations for the protection of the fisheries in 1935 were issued on January 19, the most important changes of which were the prohibition of com-

mercial fishing in the Bristol Bay region during the red-salmon runs in order to build up the weak cycle appearing in the calendar years divisible by 5, and the closing of 31 trap sites to permit a greater escapement of salmon to the spawning grounds and to check the tendency of this form of gear to monopolize fishing in certain localities.

Twelve regular and 164 temporary employees were engaged in patrolling the fishing grounds in the 1934 season in addition to the crews of 12 vessels of the Bureau and 3 chartered vessels. More extensive use than in previous years was made of chartered airplanes as an auxiliary patrol and for general supervision of the Bureau's work and inspection of the spawning areas.

Weirs for counting the escapement of spawning salmon were operated in 12 typical salmon streams in the calendar year 1934. An allotment of Public Works Administration funds enabled the reestablishment of several of these structures, both in 1934 and 1935. The counts of salmon thus made furnish valuable information in connection with life-history studies, as well as providing a means of determining the ratio of escape to catch. Scientific investigations in regard to salmon, herring, and clams were continued.

Some work was accomplished in the removal of log jams and other barriers that prevented the passage of salmon upstream to the spawning beds. In certain localities, also, natural propagation conditions were improved by the destruction of predatory fishes that feed upon the salmon eggs and fingerlings. This work was done partly by weir operators and stream guards, but chiefly through the appropriation of funds for the purpose by the Territorial Legislature and by contributions of local packers in the Bristol Bay and Yakutat regions. At its 1935 session the Territorial Legislature again appropriated $15,000 for clearing salmon spawning streams and for the destruction of predatory enemies of salmon, to be expended under the same provisions as in the case of similar previous appropriations.

ALASKA SALMON HATCHERIES

Only one salmon hatchery was operated in Alaska in the fiscal year 1935—that of the Pacific American Fisheries at Hugh Smith Lake, in the southeastern area. At this hatchery 10,221,000 red-salmon eggs were collected, from which 9,860,000 fry were produced and liberated in Alaska waters. Under the provisions of the Alaska fisheries act of June 26, 1906, the owners of private hatcheries receive a rebate on license fees and taxes on their catch and pack of salmon at the rate of 40 cents for each 1,000 red or king salmon fry liberated.

PRODUCTS OF THE FISHERIES

Notwithstanding the fact that some branches of the industry were handicapped by reason of the longshoremen's strike on the Pacific coast, which for a time caused a shortage of containers and other supplies, and by price disagreements between fishermen and packers in southeast Alaska and the Copper River area, the total output of fishery products was the largest in the history of the Territory. This exceptional harvest may be attributed especially to the abundance of salmon in virtually all producing centers and also to increased activity.

Salmon products comprised about 80 percent in quantity and 92 percent in value of the entire output of the Alaska fisheries. The total production of salmon amounted to 372,585,000 pounds valued at $38,749,000, or an increase of about 42 percent in quantity and 32 percent in value over the output of the preceding year. About 96 percent of the salmon products in the 1934 season consisted of canned salmon, the pack amounting to 7,481,830 cases, valued at $37,611,950. Red salmon represented 35 percent and pinks 51 percent of the total pack of canned salmon, as compared with 42 percent for each of these species in 1933.

The production of herring was also above the average, with a record output of meal and oil, inasmuch as large numbers of the fish taken were too small for satisfactory Scotch-curing. Halibut products declined in quantity but increased in value. A whaling station that had been closed since 1930 was reopened and the total output of whale products was more than double that for 1933. All minor species except clams showed an increased production in the 1934 season as compared with the previous year, the most marked gain being in the crab industry.

The total output of Alaska fishery products in the calendar year 1934 was 468,424,000 pounds, valued at $41,963,000, as compared with an average of 360,097,000 pounds valued at $35,845,000 for the 5-year period from 1929 to 1933, inclusive. The value of the catch to the fishermen was approximately $11,707,000, or about $2,618,000 more than in the preceding year. There were 26,190 persons employed in the various branches of the industry, as against 21,695 in 1933.

ALASKA FUR-SEAL SERVICE

GENERAL ACTIVITIES

The chief activity in the fur-seal service is the annual take of sealskins for commercial purposes during the months of June and July. Killings are confined as far as possible to 3-year-old male seals, of which approximately 50,000 are secured each season. Of the skins obtained on St. Paul Island, the majority are taken by the stripping process and blubbered before curing. The method of skinning by hand is still used altogether on St. George Island, where less than one-fourth as many skins are taken as on St. Paul Island.

Sealing operations were performed by Pribilof Islands natives and by approximately 60 natives from the Aleutian Islands under the direction of a staff of regular employees. Nineteen employees of the Fouke Fur Co. were at St. Paul Island during the season to assist with the washing and blubbering of the sealskins in accordance with the fur-seal contract.

An allotment of $3,000, by the Public Works Administration, enabled the reconditioning and repair of several buildings used in the sealing industry. Some improvements were made also in the way of construction of new buildings and boatways and the extension of surfaced roads to facilitate transportation of sealskins from the killing grounds to the curing stations.

Delivery of 15 percent of the season's take of sealskins was again made to the Dominion of Canada under the provisions of the

international treaty for the protection of the fur seals. The skins were delivered to a representative of that Government at Seattle in August 1934. The Government of Japan, which is also entitled to 15 percent of the sealskins taken at the Pribilof Islands, continued to have its skins handled with those of the United States, receiving an appropriate share of the proceeds of the sale.

Two hundred sealskins were allotted to the United States as its share of the take by the Japanese Government on Robben Island in 1934. They were received by the Department's selling agents at St. Louis, Mo., in December.

SEAL HERD

As of August 10, 1934, the computed number of animals in the Pribilof Islands fur-seal herd was 1,430,418, an increase of 111,850, or 8.48 percent, over the corresponding figure for 1933.

TAKE OF SEALSKINS

In the calendar year 1934 there were taken on the Pribilof Islands 53,468 fur-seal skins, of which 42,972 were from St. Paul Island and 10,496 from St. George Island. This is a decrease of 1,082 from the number taken in 1933.

SALE OF SEALSKINS

Two public-auction sales of fur-seal skins taken on the Pribilof Islands were held at St. Louis, Mo., in the fiscal year 1935. On October 15, 1934, 10,000 black-dyed, 3,000 logwood brown-dyed, and 6,000 of the new safari brown-dyed skins were sold for $336,846.25. At the same time three confiscated fur-seal skins, parchments, were sold for $7.50.

The second sale, held on April 8, 1935, consisted of 12,600 black-dyed, 11,500 safari brown-dyed, and 2,303 logwood brown-dyed skins, which brought a gross sum of $616,990.75.

Special sales of Pribilof Islands sealskins authorized by the Secretary of Commerce in the fiscal year 1935 consisted of 1,607 black-dyed, 1,843 safari brown-dyed, 1,027 logwood brown-dyed, and 300 raw salted skins, which brought a total gross sum of $98,460.44. In addition, the Department advertised and sold to the highest bidders for $621.22 two fur-seal coats, 1 black and 1 logwood brown, that had been used for display purposes. Each coat was made up of seven Pribilof Islands sealskins.

FOXES

The management of blue fox herds on St. Paul and St. George Islands is incidental to the fur-seal industry and requires attention at a time when sealing activities are light. Beginning about the first of December the animals are fed prepared rations and are trapped for their pelts.

During the 1934–35 season there were taken 184 blue and 16 white fox skins on St. Paul Island and 799 blue and 3 white skins on St. George Island, a total of 1,002. Eleven foxes on St. Paul Island and 266 on St. George Island were marked and released for breeding stock. The reserve includes also a considerable number of animals that were not caught in the traps.

In the fiscal year 1935 there were sold 914 blue fox skins, raw, for $21,935.50; 25 white fox skins, raw, for $333; 1 blue fox skin, dressed, for $38; and 1 white fox skin, dressed, for $24; a total of $22,330.50. The raw skins were taken on the Pribilof Islands in the 1933–34 season, and the dressed skins were of the 1932–33 season's take which had been used for exhibition purposes.

FUR-SEAL SKINS TAKEN BY NATIVES

Indians dwelling on the American coast of the North Pacific Ocean are privileged to engage in limited pelagic sealing under the provisions of the North Pacific Sealing Convention of 1911. The sealskins thus taken must be authenticated by Government officials before they can enter into commerce. In the 1934 season there were taken and duly authenticated by officials of the respective Governments 290 fur-seal skins, of which 23 were taken by Indians of Washington, 11 by Indians of southeast Alaska, and 256 by Indians of British Columbia. Reports have been received, also, of the authentication of 6 additional sealskins taken in 1933 by Indians of the State of Washington, making a total of 35 taken by them that year.

FUR-SEAL PATROL

A patrol for the protection of the fur seals was maintained by the United States Coast Guard, which detailed seven cutters and two 125-foot patrol vessels to this work in the calendar year 1934. Two vessels of the Bureau also participated successively in the patrol in the vicinity of Neah Bay, Wash., during the spring migration of the herd.

PROTECTION OF SEA OTTERS, WALRUSES, AND SEA LIONS

Regulations issued on July 1, 1934, permit certain limited killing of walruses and sea lions in Alaska under specified conditions. The killing of sea otters is prohibited at all times.

PROPAGATION AND DISTRIBUTION OF FOOD AND GAME FISHES

It is gratifying to report that a very moderate increase in the appropriation available for the propagation of food and game fishes resulted in a noticeable increase in output for the fiscal year 1935. The total distribution of fish and eggs, including fry hatched on a cooperative basis in State hatcheries, approximated 5,000,000,000 in comparison with an output of 3,258,000,000 for the previous year. The 1935 figures are still materially below the maximum output of several years ago which exceeded 7,000,000,000. To a considerable extent, this increase over the previous year was due to the resumption of the activities at the Gloucester (Mass.) station which propagates marine forms. Coupled with its increase there was a slight step-up in the output of some of the varieties, both game and commercial, handled at interior stations.

Of the hatcheries which were closed the previous year owing to economy requirements, those in Alaska and the two Michigan commercial hatcheries remained closed. The output of game fish was closely comparable to the production of these species in 1934.

The output of small mouth black bass, however, a variety most eagerly sought by the sportsmen, was almost twice the production of the previous year. There is no evidence of slackening in the demand for hatchery-produced game fish, and in fact the increased requirements for stocking areas now coming under the control of the Federal Government constitute a serious problem.

There was also a moderate increase in the output of fingerlings, constituting the larger fish with a greater stocking value. The distribution of these larger fish was approximately 4,000,000 greater than last year. The list of the species propagated was practically the same as during the previous year with the exception that no white perch were handled during 1935, but a considerable number of pollock was included in the figures for this year.

The sportsmen's organizations and the general public have largely accepted the requirement that they must themselves meet the cost of transporting the fish from the hatcheries. The problem of distribution has been further simplified by the readiness with which several State fish and game departments have undertaken to handle the fish produced at Federal hatcheries.

PROPAGATION OF COMMERCIAL SPECIES

Marine species, Atlantic coast.—An increase of approximately 1,400,000,000 in the output of cod, haddock, pollock, and winter flounder is to a large extent the result of the reopening of the Gloucester (Mass.) station. However, a large percentage of this increase is represented by eggs fertilized on the fishing boats and planted on the spawning grounds, since funds were not available for full-scale operation of the hatchery. The output of these marine forms represents between 85 and 90 percent of the total output, a ratio which is similar to the average over a number of years. No cod were propagated at the Woods Hole (Mass.) station during the year.

Pacific salmon.—While increases were registered for the output of silver and chum salmon, there was a slight decline in the distribution of chinook variety, and a very large decline in the production of sockeye salmon. This was due to negligible egg collections at the Quinault (Wash.) station, ordinarily the biggest producer of sockeyes since closure of the Alaska stations. The run of fish did not materialize, presumably on account of overfishing in previous years. The number of all species of Pacific salmon distributed in the fingerling stage compares very favorably with the record of previous years.

Anadromous species, Atlantic coast.—The production of shad was virtually the same as in 1934. An output of 860,000 Atlantic salmon in Maine was significantly larger than in the previous year when Canadian eggs were not obtainable. Land-locked salmon were produced in lesser numbers. An increase in output of yellow perch to 450,000,000 was derived from resumption of this activity at the Potomac River station at Fort Belvoir, Va.

Commercial species, interior waters.—Restriction on the activities of the hatcheries handling commercial species of the Great Lakes has continued. Consequently, the output of whitefish and lake trout has remained small, even though the production of whitefish was approximately four times the 1934 figure. The Put-in-Bay (Ohio)

station again handled large numbers of pike perch, collecting over 500,000,000 eggs, the majority of which were incubated and distributed by the State. Two hatcheries in Michigan remained closed.

GAME SPECIES

As a whole, operations with the game species yielded satisfactory results. Inasmuch as some 15 species are included in this category, there were fluctuations among individual forms in comparison with last year's production. Special effort was made to augment the output of bass, owing to their high popularity in all parts of the country. It would be possible to increase the output of trout, particularly by distributing them at smaller sizes, but this would lower their stocking value. However, the problems surrounding the rearing of trout have been greatly intensified by the sharp increase in the price of food for fishes which became evident toward the close of the fiscal year.

RESCUE OPERATIONS

An increase in the amount appropriated for the administration of the Bureau's activities in the Upper Mississippi River Wild Life Refuge was reflected in a virtual doubling of the number of fish rescued. There was handled a total of 47,286,000 fish, comprising 10 species. This is still below the average number which can be rescued when funds are available to cover the entire territory where water conditions make the salvaging of fish trapped in land-locked areas an urgent need. Only 115,900 fish were distributed to other sections, the balance being returned directly to open waters.

AQUARIUM

The aquarium located under the main lobby in the Department of Commerce Building is maintaining its reputation as one of Washington's popular points of interest to visitors. The numerous organizations which gather for conventions in Washington, as a rule, include the aquarium in their itinerary of sight-seeing.

The general exhibits were maintained in much the same manner as during the previous year, and the display of trout has continued to be a point of particular interest. However, from time to time during the year it has been the practice to introduce more novel exhibits, one of which was the 500-pound green turtle. Another interesting novelty was a pair of Piranha—the small man-eating fish of the Amazon Basin.

The aquarium also was of great service in preparing and forwarding foreign shipments of live fish and eggs which were made to Cuba, Puerto Rico, Panama, and Venezuela.

As usual, the display of model hatching apparatus was kept in operation for the purpose of illustrating the methods followed in incubating various types of eggs.

MARKETING INVESTIGATIONS

Per capita consumption of fish.—A study made during the year indicates the domestic per capita consumption of fish amounted to 13.3 pounds in 1931. This is compared with a per capita consumption of meats amounting to 133.2 pounds in the same year.

STATISTICAL INVESTIGATIONS

FISHERIES OF THE UNITED STATES, CALENDAR YEAR 1933

New England States.—During 1933 the commercial fisheries of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut employed 17,073 fishermen. Their catch amounted to 499,936,000 pounds, valued at $13,486,000, an increase of 4 percent in volume, but a decrease of 4 percent in value as compared with the catch in 1932. Landings of fish by American fishing vessels at Boston and Gloucester, Mass., and Portland, Maine, amounted to 267,157,000 pounds as landed, valued at $6,851,000—an increase of 6 percent in volume, and 13 percent in value, as compared with the preceding year.

Middle Atlantic States.—The commercial fisheries of New York, New Jersey, Pennsylvania, and Delaware in 1933 gave employment to 8,574 fishermen. Their catch amounted to 169,754,000 pounds, valued at $4,811,000—an increase of 20 percent in volume, and 3 percent in value as compared with 1932. Landings of fish at New York City during 1933 amounted to 25,455,000 pounds. The shad fishery on the Hudson River was conducted by 317 fishermen, who caught 519,000 pounds of shad, valued at $41,000—a decrease of 2 percent in volume and 20 percent in value as compared with 1931.

Chesapeake Bay States.—In 1933 the commercial fisheries of Maryland and Virginia employed 20,142 fishermen. Their catch amounted to 272,380,000 pounds, valued at $5,061,000—a decrease of 24 percent in volume and 14 percent in value as compared with the previous year. The shad and alewife fisheries of the Potomac River were prosecuted by 651 fishermen, who caught 1,838,000 pounds of shad, valued at $149,000 and 6,896,000 pounds of alewives, valued at $24,000—a decrease of 19 percent in the catch of shad, but an increase of 1 percent in the catch of alewives.

South Atlantic and Gulf States.—No survey was made of the fisheries of this area for the year 1933.

Lake States.—No survey was made of the Lake fisheries (Lakes Ontario, Erie, Huron, Michigan, and Superior, and Namakan and Rainy Lakes, and Lake of the Woods) for 1933.

Pacific Coast States.—The commercial fisheries of Washington, Oregon, and California in 1933 employed 18,673 fishermen. Their catch amounted to 860,161,000 pounds, valued at $13,988,000—an increase of 53 percent in volume and 47 percent in value, as compared with 1932. The total catch of halibut by United States and Canadian vessels amounted to 45,951,000 pounds, valued at $2,582,000—an increase of 6 percent in volume and 48 percent in value, as compared with the preceding year.

Mississippi River and tributaries.—No survey was made of this area in 1933.

MANUFACTURED PRODUCTS IN UNITED STATES AND ALASKA, CALENDAR YEAR 1933

Fresh and frozen packaged fishery products.—Based on the most recent data available, the domestic production of fresh and frozen packaged fishery products amounted to 129,608,000 pounds, valued at

$17,294,000. Important products in this group consist of fresh shucked oysters, 5,687,000 gallons, valued at $6,864,000; packaged haddock, 35,149,000 pounds, valued at $3,457,000; and fresh-cooked packaged crab meat, 6,864,000 pounds, valued at $1,662,000.

Frozen products.—The production of frozen fishery products in 1933 amounted to 95,874,000 pounds, estimated to be valued at about $8,000,000. The volume of the production was 4 percent greater than in 1932. The most important products frozen with respect to volume were ground fish, halibut, salmon, mackerel, whiting, and shellfish.

Cured products.—Based on the most recent data available, the domestic production of cured fishery products amounted to 104,310,000 pounds, valued at $12,823,000. Important products in this group were boneless cod, 9,517,000 pounds, valued at $1,646,000; and smoked salmon, 8,229,000 pounds, valued at $2,256,000.

Canned products.—Canned fishery products produced in 1933 amounted to 533,212,000 pounds, valued at $59,800,000—an increase of 37 percent in the value as compared with 1932. Canned salmon alone amounted to 305,398,000 pounds, valued at $36,242,000. Other important products were tuna and tunalike fishes, sardines, shrimp, mackerel, clam products, and oysters.

Byproducts.—During 1933 the value of the production of fishery byproducts amounted to $17,466,000—an increase of 40 percent as compared with the preceding year. Important products in this group consist of marine animal oils and meals, and aquatic shell products.

TECHNOLOGICAL INVESTIGATIONS

These investigations cover the general field of food technology as applied to fishery products. They involve the application of the sciences of chemistry, engineering, bacteriology, and general technology to the manufacture, preservation, and utilization of our fishery harvest. Chemical and bacteriological investigations dealing with the preservation of fishery products for food, the utilization of fishery byproducts, the nutritive value of aquatic products, and fish cookery investigations constituted the general scope of studies in fishery technology. Some of the outstanding accomplishments during the past year were: The development of methods for the home canning of some species of fish; increasing the practical value of and simplifying methods for determining the relative freshness of fish; the discovery of further facts concerning the high vitamin potency of fish oils and fish-liver oils; expansion of the possibilities for utilizing salmon cannery waste and other fish waste; discovery of further data on the role of the mineral constituents of fishery products in nutrition; and the issuance of a pamphlet on practical fish cookery.

Preservation of fishery products for food.—Studies in this field, in general, pertain to the chemistry and bacteriology of fish preservation and spoilage, the development of improved methods for handling fresh and frozen fish, studies on the smoking of fish, and the development of methods for canning fish in the home. During the past year, a better method for packing fresh mackerel for shipment was devised which is considered to be superior to the present com-

mercial method of "floating." One difficulty encountered in the storage of frozen mackerel is the tendency of the oil or fat in the fish to become rancid, thereby making the mackerel unfit for use. Obviously, the intensity of rancidity is dependent upon the percentage of oil in the fish, which percentage is subject to considerable seasonal fluctuation, the maximum percentage occuring in August. Studies are being made to prevent or minimize this difficulty. A process was developed for smoking mackerel which produced a high quality product. This process has promise of commercial application and should be of aid in expanding the market for mackerel during periods of unusual abundance. Other studies revealed that losses of food value through leaching would be prevented if fish are covered with waterproof wrappers when packed in ice for shipment. Progress was made in developing a practical method for determining the relative freshness of cod, pollock, and mackerel under commercial conditions. A pamphlet was issued containing practical and tested methods for canning some species of fish in the home.

Bacteriological investigations.—Bacteriology plays a role in nearly all technological investigations of fishery products in that the various experimental products or methods are under bacteriological control. For instance, bacteriological examinations were made of the experimental packs of fish canned by the Bureau to determine which processes produced sterility, on the keeping quality of fresh mackerel packed in ice, in determining the preservative value of smoke, and on the tests developed for determining the relative freshness of fish. In addition, special bacteriological investigations were conducted for the development of disinfectants for sponges in household use and for determining the effect of antiseptics in ice on the keeping quality of fresh haddock when packed in such ice for temporary preservation.

Preservation of fishery byproducts.—The value of the Bureau's investigations in the field of fishery waste utilization has been very apparent during the past year. Studies with respect to the utilization of salmon cannery waste have demonstrated that valuable vitamin-active oils and a high quality edible oil can be recovered from this type of material by proper methods of preparation. The vitamin oils have been proved as desirable sources of fat soluble vitamins for poultry feeding and also as a new and reasonable source of these vitamins for human nutrition. The edible salmon oil may be added to canned salmon to improve both the nutritive value and appearance of the pack. Definite commercial application has been made of the results of the above study with advantage.

Studies on the manufacture of fish meal have demonstrated the possibility of producing materials of higher quality, and the fundamental information obtained in the course of these investigations has contributed much to a better understanding of the value of fish meals in animal feeding.

By investigation of the oil contained in swordfish livers, the Bureau discovered the richest known natural source of both vitamins A and D, and as a result of this work the fishing industry is obtaining additional revenue from the sale of livers which were formerly discarded. Swordfish-liver oils can be prepared that contain as high as 300,000 U. S. P. vitamin A units and 9,500 U. S. P. vitamin D

units as compared to the minimum requirements for cod-liver oil of 600 vitamin A units and 95 vitamin D units. Besides giving added revenue to the fishing industry, these studies contributed to the domestic supply of vitamin-bearing materials.

Nutritive value of aquatic products.—Studies of the nutritive value of aquatic products during the past year included a determination of the vitamin content of swordfish-liver oils, salmon oils, and other fish and fish-liver oils extracted according to various experimental methods as previously discussed; a determination of vitamins A and G in crab meat, a study of the food value of sodium alginate, analyses of conch meat; and data on the role of the mineral constituents of fishery products in nutrition. In making these studies, our technologists made use of chemical methods and practical feeding tests with laboratory animals as well as biological tests with human subjects. Our investigations reveal that fish oils and fish-liver oils are of great potential sources of vitamins for both human and animal nutrition; that crab meat is a relatively good source of vitamins A and G; that sodium alginate is not only of value as a stabilizer in the preparation of dairy products, but that it has food value comparable to the kelp from which it is made; and that the mineral constituents found in fishery products and byproducts are of great importance in human and animal nutrition.

Fish cookery investigations.—During the past year, the Bureau established a fish cookery laboratory and developed by actual tests simple and practical recipes for the preparation and cooking of fish and shellfish. A very popular publication on practical fish cookery was issued and widely distributed by the Bureau, based on these recipes.

BLACK BASS AND ANGLERS DIVISION

The black-bass law was enforced by 2 regular field officers, 1 or 2 temporary employees, 1 permanent employee in the Washington office, and approximately 100 deputy black-bass-law inspectors who are regularly employed State fish and game protectors, and who serve the Federal Government without pay under the direction of the Chief of the Division. Several violations of the Federal black-bass law were found, but in only one instance was it necessary to report the case for prosecution in Federal court. Active field work has been conducted in well-known black-bass areas east of the Rocky Mountains, and fish markets of the principal cities have been inspected for illegal shipments. The Division receives the hearty cooperation of all the State authorities in those States where it functions.

During the year the legislatures of 44 States met in regular session, affording an opportunity to obtain much needed State legislation protecting black bass, without which the Federal law cannot be fully effective. Three States passed laws prohibiting the sale of black bass at all times, regardless of where taken, making a total of 37 States where these game fish are afforded this means of protection. One State adopted a closed season, leaving but 7 States that do not now protect the bass on the nest during at least a part of the spawning period. The closed season was also extended in several States.

Several States increased the size limit or decreased the daily limit on black bass; 6 States adopted a commission form of administering

the State fish and game laws, and several increased the powers of the commission to promulgate regulations. Part-time nonresident tourist licenses were adopted in 8 States.

The adoption of all these measures was advocated by the Bureau in line with its policies for the protection and increase of the black bass.

Because of its administration of the Federal black-bass law, the Division is daily called upon for information about seasons, angler's licenses, and every subject pertaining to angling. Especially is it requested by letter, telephone, and personal call to advise the applicants, how, when, and where to fish. It has been necessary for the Division to prepare a number of small pamphlets, as follows: List of Books on Angling, List of State Fish Agencies, Compilation of Anglers Licenses Issued by the States and Revenue Derived Therefrom, Tabulation of the Laws Covering the Sale of Black Bass in the Various States, List of States that have Adopted the Part-Time Angler's License; and a leaflet entitled "Angling" which supplies many items of interest to the angler. There has been a large demand for all of these publications, which may be obtained only by applying to the Bureau of Fisheries.

Owing to the many changes in the game-fish laws in 1935, Fishery Circular No. 16 containing the game-fish laws for 1933–34 has been revised, and will be published early in the next fiscal year.

Twenty-seven permits for taking certain species of small fish in the District of Columbia for use as bait, have been issued in the Division during the year, a decrease of 11 over the last fiscal year.

VESSELS

Thirteen vessels of the Alaska service cruised about 116,000 nautical miles in the fiscal year 1935, as compared with 127,000 nautical miles by 15 vessels in the preceding year. The *Penguin* logged the greatest distance, with aproximately 27,700 miles; the *Brant* and *Teal* each covered about 13,300 miles; and the *Crane*, about 11,000 miles.

The *Penguin* made five round-trip voyages from Seattle to the Pribilof Islands, transporting personnel and emergency supplies. Supplies also were landed in the Aleutian Islands for the Navy Department and the Coast and Geodetic Survey.

The *Auklet*, *Kittiwake*, and *Teal* were engaged in fishery protective work in southeast Alaska during the 1934 season. The *Murre* operated in the Seward-Katalla district and the *Eider* in the Kodiak area. The *Scoter* patrolled the waters of Cook Inlet and in the fall, after the departure of the *Eider*, was assigned to the Kodiak area. The *Crane* and *Red Wing* were in the Alaska Peninsula region, and the *Blue Wing* was in Bristol Bay. After the close of the Bristol Bay season the *Blue Wing* assisted with the patrol in the Alaska Peninsula area and in southeast Alaska. As formerly, the *Ibis* was stationed at Chignik, and the *Coot* was on the Yukon River.

The *Widgeon* and *Petrel*, which were operated in southeast Alaska in the fiscal year 1934, were out of commission at Seattle.

The *Brant* was used in general supervisory work, chiefly in southeast Alaska, although two trips were made to Bristol Bay in west-

ern Alaska. Fur-seal patrol off Neah Bay, Wash., also was maintained by the *Brant*. A similar patrol in the vicinity of Sitka, Alaska, was carried on by the *Scoter*.

APPROPRIATIONS

Appropriations for the Bureau for the fiscal year aggregated $1,325,327, as follows:

Salaries, Commissioner's office	$136,600
Propagation of food fishes	570,600
Maintenance of vessels	135,380
Inquiry respecting food fishes	151,214
Fishery industries	57,125
Protecting seal and salmon fisheries of Alaska	245,693
Upper Mississippi Wildlife and Fish Refuge	15,000
Enforcement of black-bass law	13,715
Total	[1] 1,325,327

[1] Exclusive of indefinite deficiency appropriation of approximately $25,000 for restoration of salaries. Also exclusive of an appropriation of $100,000 for the fiscal year 1936 for oyster-pest control work, of which $50,000 was made available immediately following the approval of the act on Mar. 22, 1935.

LIGHTHOUSE SERVICE

George R. Putnam, Commissioner of Lighthouses since July 1, 1910, retired from active service on May 31, in accordance with the Lighthouse Service retirement law. Mr. Putnam was appointed by the President to the newly created position of Commissioner of Lighthouses in 1910 and carried out the reorganization of the Lighthouse Service under the provisions of the act of June 17, 1910. The administration of the Lighthouse Service was much simplified, district offices were combined, and considerable economies were effected. Further economies have been effected in recent years by the extensive introduction of automatic lighting apparatus and the replacement of a considerable number of lightships by fixed structures and improved buoys. At the same time the number of lighted buoys has been greatly increased, and the total number of aids has been more than doubled. Especial attention has been paid to the building up of a competent technical corps and the operation of the Lighthouse Service on a decentralized system. During this period much pioneering work in furthering the application of radio to aids to navigation was accomplished. To the Commissioner's vision in this field is due in great measure the rapid progress made since 1921 in the addition of radiobeacons to lighthouses and lightships, which constitute an advance of first importance in safeguarding navigation; for since the discovery of the magnetic compass, navigation has had no greater need than that for a practical instrumental means of taking bearings on invisible objects.

The office of Commissioner of Lighthouses has since been filled by the appointment by the President, upon the recommendation of the Secretary of Commerce, of H. D. King, formerly Deputy Commissioner and for a number of years superintendent of three important districts.

The Lighthouse Service is becoming increasingly mechanized through the application of modern mechanical devices and equipment. This equipment has resulted in better aids to navigation and has been a factor in making possible the extension of the Service to meet the growing needs of navigation at a minimum of cost and with a gradual reduction in operating personnel.

Allotments from the Public Works Administration totaling $5,620,334 from funds provided by the National Industrial Recovery Act have enabled the Lighthouse Service during the past 2 years to materially improve its plant and carry out a considerable number of desirable and economical projects more rapidly than heretofore possible of accomplishment under the normal Public Works appropriations. During the 2-year period this Public Works program has been under way no direct appropriations for special works for the Lighthouse Service have been made by Congress, as had been done in prior years.

This work has included the following: The erection of 10 major light-station structures, 4 in replacement of lightships, 3 in replacement of former structures, and 3 new ones, 6 of these new stations being on submarine sites; the provision of 5 new lighthouse depots and improvements of 10 others; the construction of 2 new district-office buildings on sites at depots, effecting a desirable concentration of administrative and supply operations; the construction of 3 new lighthouse tenders and 2 derrick barges and the extensive overhauling of 16 lighthouse tenders, including reboilering, change to oil burning, etc.; similar overhaul of 6 lightships; the improvement of housing facilities by new construction at 10 stations and repairs at a number of others; improvement of the mechanical equipment of stations and particular improvements in the character of radiobeacon transmitting equipment, some 30 stations having been provided with modern equipment, replacing obsolete units and securing the great advantages of frequency stability and freedom from interference resultant therefrom.

This construction program is now nearing completion, and it is anticipated that all projects will be completed during the construction season of 1935. In addition to its effect in improving the plant of the Lighthouse Service and making possible increase in efficiency and extension of economies in operation, this program has been effective in the relief of unemployment.

The twelfth conference of district superintendents was held in Washington from January 28 to February 2. These sessions facilitated a highly desirable exchange of ideas on many technical and administrative matters between superintendents from widely separated parts of the country. In addition, the superintendents were addressed by representatives of several other Government agencies having work related to that of the Lighthouse Service.

On October 18, N. C. Manyon was transferred as superintendent of lighthouses, from the ninth district to the fourth district, with offices in Philadelphia; and on the same day G. W. Hitchens assumed the duties of superintendent of the ninth district, with headquarters at San Juan, P. R.

After an extensive test of equipment in several districts and consideration of the matter at the recent conference of lighthouse superintendents, an arrangement of flashing-light characteristics to indicate the purpose of buoys is being placed in general operation throughout the Service and will probably be completely effective by the close of the present calendar year. The color and shapes of buoys and the color of the light to a lesser extent have long been used to indicate their purpose. Odd and even flash groupings have also been used to indicate particular sides of the channel. The main feature of the new plan is the use of distinctive quick-flashing lights to indicate the need of more than ordinary caution, such as for buoys marking wrecks, junctions, turns between successive reaches of narrow but important channels, and for isolated dangers and other buoys of special significance. Complete details regarding the meaning of the flashing-light characteristics will be published as soon as the installation has been generally accomplished. Favorable comment has been received from mariners where trials have been made.

During the year there was issued, for distribution among mariners, a small pamphlet describing the recent improvements in the aids to navigation upon the Great Lakes, and also giving much other valuable information regarding the facilities which the Lighthouse Service makes available to mariners.

With the erection of the north pylon of the New Golden Gate Bridge at San Francisco, it was necessary to discontinue Fort Point Light Station, probably the second light to be established upon the California coast. This light was built in 1855, upon the site of an old Spanish fort.

On May 15, 1935, the first anniversary of the sinking of Nantucket Lightship, a white marble cenotaph listing the names of the five New Bedford men who lost their lives in that tragedy was dedicated in New Bedford. This memorial was erected under the auspices of a group of New Bedford residents known as the "Nantucket Memorial Committee."

During the year continual progress was made in the improvement of aids to navigation; 59 lights were changed from fixed to flashing or occulting, the illuminant of 87 lights was changed to electric, and the illuminant of 27 to acetylene. Sodium-vapor lamps are in use experimentally at two stations. Three new radio beacons were established, increasing the total number of such installations to 108.

On June 30, 1935, there were 24,459 aids to navigation maintained by the Service, a net increase over the previous year of 862. There were 1,013 aids discontinued during the year as being no longer necessary or as having been replaced by more suitable aids.

IMPROVEMENTS IN APPARATUS AND EQUIPMENT

Electricity has become of increasing importance in the operation of the Lighthouse Service, both as a light source and as a power supply for fog signals, radio beacons, and mechanical devices of varied types. Eight acetylene and seventy-nine oil lamps have been changed to electric incandescent during the year. In several instances the lens which formerly was revolved by clockwork has been fitted with motor drive. In connection with electric illuminants, further experiments have been in progress to provide filaments best suited to the lenses in which they are intended to be used, and to standardize further on types of lamps for various uses.

Additional installations of light-sensitive cells have been made at light stations to turn off the light during daylight hours. Range lights interconnected so as to operate in synchronism, which were placed in operation at a number of locations, have been received favorably by mariners.

The number of minor lights operated by batteries of dry cells and primary cells is increasing as rapidly as consistent with proved reliability and economic justification. Storage batteries are also used where commercial current or station generators are available for recharging. Experimental installations using nonspillable storage batteries for electric-lighted buoys have been made with good results. Packs of dry cells designed to fit the tank pockets of gas buoys are also in use. The test of a battery-operated fog horn on a buoy is still under way; operating on a current of 3 amperes at 12 volts

drain on the battery, a signal equal to a 1,000-pound bell on a buoy in average sea conditions is obtainable.

Considerable improvement in radio apparatus is being made. Nine installations of obsolete transmitting equipment have been replaced by modern equipment and about 30 additional sets are being installed as conditions permit.

A low-power crystal-controlled radio-beacon transmitter for use on lightships on inside waters has been developed at the radio laboratory in Detroit and additional units purchased on this design to equip seven lightships not now having radio beacons.

The laboratory has developed a design of a crystal box to stabilize the frequency of existing radio-beacon transmitters.

The operation of Fourteen Foot Shoal Light Station in the Straits of Mackinac, Mich., which has been radio controlled from Poe Reef Light Station, about 4 miles distant, is no longer considered as experimental. The observer heretofore stationed at Fourteen Foot Shoal has been withdrawn, as the station is functioning satisfactorily. The successful conclusion of this experiment has led the Bureau to extend this method of control to a lightship, the signals in this instance being controlled from a shore station 8 miles distant, and further complicated by the addition of a radio beacon to the station equipment. The results of the adaptation of radio control to some of the major functions of this lightship are being carefully studied.

Ten additional installations of radiotelephone equipment, making a total of 29, have been made, providing more ready communication in times of emergency and giving direct administrative control which is necessary for effective supervision of remote inaccessible stations and the other aids in their vicinity. Telephone-communication facilities, either radio or wire, are now installed at 328 stations.

A self-correcting timer for synchronization of radiobeacon and air signals has been developed. A tuning-fork timer to accomplish the same purpose has also been tested. The radiobeacon and sound signals have now been synchronized for distance-finding purposes at 43 stations, a simple uniform system being adopted for all coast stations.

An improved type of antenna has been designed for use on lightships; and an experimental installation of an improved type of antenna mast for shore stations has been contracted for.

A radio warning signal of limited range, supplementing the regular radiobeacon, was established on Nantucket Shoals Lightship to indicate to navigators their close proximity to the station. Similar experimental installations have been under test on a lightship and at a fixed station, on the Great Lakes.

The design for the new lightship to be stationed on Nantucket Shoals embodies several features to insure greater safety, and also includes the latest improvements in signaling equipment.

Marked economies are being effected by the program now in progress of providing where practicable fully equipped light stations on submarine sites in place of lightships. Where attended stations have become of decreased importance or are ill-adapted to the present needs of the mariner, these are either being replaced by automatic

aids more favorably located, the old aids being disposed of entirely, or automatic apparatus is installed at the existing stations with resultant economy. The establishment of a buoy, off the site of the station, which can be directly approached and passed close by, has in some instances improved conditions. The use of small circular caissons of sheet piling for unattended lights on submarine sites has been extended.

Experiments to determine the practicability of allowing second- and third-class nun buoys to remain on stations in the Great Lakes during the winter were carried out last year. The damage suffered from running ice in a test of over 80 buoys of these types was found to be negligible.

The program of modernizing fog signals throughout the Service is being continued. A number of diaphones were installed during the year and others are being put into service. New installations of the diaphragm types of sound signal have also been made. The fog-signal testing laboratory built at Cape Henry Light Station, Va., is being equipped with precise instruments and other suitable apparatus for determining the relative efficiency of the various sound signals in use, and for obtaining data by means of which improvements in design may be worked out.

Reports are being received from masters of commercial vessels on their observations of the operation of sound signals at five selected stations on the Great Lakes. These observations will be classified and evaluated by the Bureau for use in its studies of the vagaries incident to the transmission of sound in air under various conditions.

Several additional installations of compressed-gas-operated fog bells have been made during the fiscal year.

A uniform method of marking the intracoastal waterway, particularly that portion extending south from Norfolk, Va., has been adopted. To a considerable extent, standardization of structures will also be accomplished. A drawing illustrating the system and showing the approved practice as to lighting, shapes, colors, etc., has been prepared for the use of the districts.

Improvements in the informational service rendered navigators have been continued both as to the timeliness and the completeness of the information supplied in regard to navigational aids. Resort has been had to the publication of sketches in the Notices to Mariners in some instances to illustrate complicated situations, such as those arising from the temporary partial closure of channels for dredging. The use of radio broadcasts has been systematized and increased.

ADMINISTRATION

Appropriations for the maintenance of the Lighthouse Service totaled $8,981,654 for the fiscal year 1935. There were no additional allotments by the Public Works Administration during fiscal year 1935 for special works, but such work was continued throughout 1935 from allotments made during 1934. There were also allotted from the Department appropriations, for contingent expenses, $4,000, and for printing and binding, $23,100, in addition to which $4,750 was transferred from General Expenses, Lighthouse Service, 1935, to the Bureau's allotment for printing.

There was received and deposited in the Treasury the following: From sale of Government property, $27,146.09; rent of buildings, etc., $3,155.56; forfeitures by contractors, $7,014.45; reimbursement for property destroyed or damaged, $5,172.88; work done for private interests, $3,106.96; commissions received on telephones, $22.58; total, $45,618.52.

Important changes in the location of district offices, which will permit of the more efficient handling of Government business, have been made during the year. The offices of the superintendent of the first district have been moved from the Federal Building in Portland, Maine, to the recently completed depot at South Portland, where nearly all of the depot work of the district has also been concentrated. The offices of the sixth lighthouse district have been moved to the recently completed office building at the Charleston (S. C.) Lighthouse Depot. The offices of the fifth district have been moved from Baltimore, Md., to Norfolk, Va., where they are in close proximity to the district's most important depot at Portsmouth, Va., and also close to the geographic center of the district. A suboffice is being maintained in Baltimore in order to keep in touch with maritime interests of that important seaport.

Items of special legislation affecting the Lighthouse Service made by the Seventy-fourth Congress, first session, provided for the transfer of 35 parcels of land to various local governments and to other Government departments; and also for the exchange of property at Key West, Fla., between the Navy Department and the Department of Commerce. The 35 parcels transferred were distributed as follows: Navy Department, 1 in Maryland; War Department, 1 in Texas, 1 in Massachusetts, 1 in South Carolina, 1 in New York; Department of Agriculture, 1 in Georgia, 1 in South Carolina, 1 in Michigan; Treasury Department, 1 in Michigan; to various townships, counties, and State governments, in Maine, 2 parcels; in Massachusetts, 3 parcels; in New York, 2 parcels; in New Jersey, 2 parcels; in Delaware, 1 parcel; in Michigan, 5 parcels; in Ohio, 1 parcel; in Wisconsin, 2 parcels; in Florida, 2 parcels; in Oregon, 2 parcels; in California, 1 parcel; in Washington, 1 parcel. Most of the transfers to local authorities were made for park purposes or road improvements, and included only those portions of lighthouse reservations no longer needed for lighthouse purposes. One parcel, in Maine, was transferred to a private person for a consideration. Certain additional rocks off the coast of California were reserved for lighthouse purposes as possible future sites for aids to navigation.

A readjustment of the boundary between the third and fourth lighthouse districts was made, by Department authority, on May 1, by which certain aids in the approaches to Delaware Bay, including Overfalls Lightship, are placed under the jurisdiction of the fourth district.

A violent storm which struck the Oregon and Washington coasts October 21 attained maximum force off the mouth of the Columbia River, where a wind velocity of 109 miles was reported at North Head Light Station, and seas of tremendous size drove Relief Lightship *No. 92*, occupying the Columbia River Lightship Station, 2 miles

off her charted position, despite the drag of her mooring and full speed ahead on the engines. Tillamook Rock Light Station, Oreg., 20 miles south of Cape Disappointment, at the entrance to the Columbia River, sustained the full force of the storm. The focal plane of its light is 133 feet above normal high water. Repeatedly the entire station was completely submerged in tremendous seas which, meeting the precipitous sides of the great rock, swept upward and over the masonry and ironwork structure surmounting the crest. A section of the rock itself was torn away, and much damage was done to the station. An assistant keeper's hand was badly cut by flying glass. Extremely hazardous conditions were encountered by the lighthouse tender assigned to the work of landing men and materials for the making of repairs, a second severe storm occurring while this work was in hand. During this last storm, two keepers and a foreman of the working party fell ill of influenza, brought on by exposure. As their removal was imperative, the lighthouse tender *Rose* succeeded after one futile attempt in removing the men by breeches-buoy lines, and landing others to take their places.

PERSONNEL

During the fiscal year there was a net decrease of 181 in the authorized personnel for operation and maintenance of the Service, this reduction having been mostly in the field force for construction and repair in connection with the completion of public-works projects authorized from emergency appropriation allotments. The total number of persons employed as of June 30, 1935, was 4,992, including 1,166 light keepers and assistants; 1,770 officers and crews of lightships and tenders; 101 Bureau officers, engineers, and draftsmen, district superintendents, and technical assistants; 176 clerks, messengers, janitors, and office laborers; 131 depot keepers and assistants, including laborers; 1,178 lamplighters, etc., mostly part-time employees; and 465 field force employed on construction and repair work. In addition to the above there were 36 temporary technical and clerical personnel paid from emergency funds.

During the general economy program of the Government for the purpose of curtailing expenses constant effort was made in cases of necessary reduction of personnel to minimize hardships, especially where employees of long and satisfactory service were affected. When stations or vessels were discontinued, if the personnel could not be provided for immediately by transfer to other stations or vessels, these persons were temporarily furloughed, and as further vacancies occurred they were given prior consideration, and in this way substantially all meritorious men were reemployed. Especial pains were taken by the Service in this difficult and critical period, and it is thought that a gratifying measure of success was achieved.

In addition to their regular duties a number of employees rendered aid to those in distress. During the fiscal year about 91 instances of saving life and property or rendering other valuable aid were reported, many of these acts having been performed at great personal risk, and, in some cases, being considered especially meritorious, the employees were commended by the Secretary of Commerce.

LIGHTHOUSE DEPOTS

Important additions and improvements to the depots of the Service have been made during the fiscal year.

At Portland, Maine, a combined storehouse and office building, a blacksmith shop, and a garage have been erected. The depot has been enclosed with a suitably designed fence, and a concrete deck on the wharves has been completed. Water-front property, wharf, and appurtenances at Southwest Harbor, Maine, formerly owned by the Eastern Steamship Co., have been purchased for a subdepot to replace the depot at Bear Island, which was not connected to the mainland. It is planned to remove the old buildings on the site, repair and extend the wharf, and make other necessary improvements.

A new steel building has been provided at Edgemoor Depot, Delaware.

At Portsmouth, Va., the depot shops have been modernized and new machinery installed. All shop equipment and machinery formerly at Lazaretto Depot, Baltimore, have been moved to the more modern shops at Portsmouth. occasioned by the transfer of the office of the fifth lighthouse district from Baltimore, Md., to Norfolk, Va.

The new office building for the sixth lighthouse district, located in the Charleston depot grounds, has been completed.

A wharf has been constructed at the newly acquired depot site on the Industrial Canal at New Orleans, La., and a storehouse is under construction.

In the eleventh district, waterfront property on the St. Marys River at Sault Ste. Marie, Mich., has been acquired for a depot. A storage building has been erected on the site and work on a steel pile bulkhead and boat slip is in progress.

A new wharf at Tongue Point Depot, Oreg., and the keeper's dwelling, roadway, etc., at Los Angeles Depot, Calif., have been completed.

It has been necessary to relocate the depot annex at Honolulu, T. H., because of dredging improvements in Honolulu Harbor.

Various items of equipment necessary for the proper functioning of these important adjuncts to the Lighthouse Service, such as trucks, welding outfits, etc., have been purchased.

LIGHTHOUSE TENDERS

At the end of the year 59 tenders were in commission, including 1 laid up in reserve. Thirty of the tenders in commission are fitted with direction finders; 31 have radio communication; 6 have radiotelephones.

The following tenders have been extensively overhauled during the year: *Anemone*, *Aspen*, *Magnolia*, *Camellia*, *Crocus*, *Oak*, *Hawthorn*, *Hibiscus* and *Mangrove*.

The following were the number of tenders on June 30 of the years specified, omitting small vessels not having regular crews: 1910, 51; 1920, 55; 1930, 55; 1935, 59.

Four new tenders were completed and placed in commission during the year: The tender *Hemlock* to replace the *Fern*, in Alaska; the tender *Tamarack* to replace the *Clover*, in the St. Marys River; the

tender *Jasmine* to replace the *Cosmos*, on the Gulf coast; and the tender *Rhododendron* to replace the *Larch*, on the Columbia River.

Five tenders, the *Oak*, *Hawthorn*, *Magnolia*, *Anemone*, and *Hibiscus* were converted from coal to oil burning.

The tender *Camellia* was being converted from steam to Diesel propulsion. New boilers were installed on the tenders *Anemone*, *Crocus*, and *Magnolia*. The auxiliary machinery was electrified on the tender *Palmetto*.

The following tenders were sold on the dates named: *Fern*, September 19, 1934; *Clover*, May 25, 1935; *Elm*, August 14, 1934. The tender *Larch* was authorized to be transferred to the Federal Emergency Relief Administration (Oregon division).

LIGHTSHIPS

At the close of the year lightships were maintained on 34 stations, and 47 lightships were in commission, of which 8 were regular relief ships and 5 were in reserve.

Lightships *No. 75*, *No. 76*, *No. 78*, *No. 83*, *No. 84*, *No. 88*, *No. 90*, and *No. 102* have been reconditioned. *No. 95* has been transferred from the Great Lakes to the Atlantic coast and is now being reconditioned. Lightships *No. 82* and *No. 96* are also to be transferred to the Atlantic coast and reconditioned.

The lightship stations at Eleven Foot Shoal, Peshtigo Reef, Grays Reef, and North Manitou Shoal are soon to be permanently discontinued and the vessels replaced with fixed structures. When this is accomplished, Lake Huron Lightship, and Lake St. Clair Lightship (unattended), will be the only lightships remaining on the Great Lakes, others having been replaced by more efficient aids. It is probable that lightships *No. 16*, *No. 69*, and *No. 77* will be condemned and sold during the next year, being beyond economical repair.

A contract has been awarded for the construction of a new lightship, *No. 112*, to replace *No. 117*, sunk through collision, May 15, 1934, on Nantucket Shoals Station.

The following lightships were sold during the year, being beyond economical repair: *No. 13* on December 13, 1934; *No. 39* on June 24, 1935; *No. 41* on October 29, 1934; *No. 80* on December 13, 1934.

OPERATION AND CONSTRUCTION, LIGHTHOUSE SERVICE, FISCAL YEAR 1935

PROGRESS OF VESSELS UNDER CONSTRUCTION OR COMPLETED

Tender "Jasmine."—This tender was completed during the fiscal year and was placed in commission in the eighth lighthouse district, where it will operate in the inland waters of Louisiana, Texas, and adjacent territory.

Tender "Tamarack."—See annual report, 1934. This tender was completed during the fiscal year and was placed in commission in the eleventh lighthouse district for service in the St. Marys River, Mich.

Tender "Hemlock."—See annual report, 1934. This tender was completed during the fiscal year and was placed in commission in the sixteenth lighthouse district, embracing the waters of Alaska.

Tender "Rhododendron."—This tender was completed during the fiscal year and was placed in commission in the seventeenth lighthouse district, where it is used on the Columbia River.

Lightship "No. 112."—This lightship is being built under contract with the Pusey & Jones Corporation, Wilmington, Del., at a cost of $300,956. On June 30, the vessel was approximately 10 percent completed.

PROGRESS OF SPECIAL WORKS UNDER CONSTRUCTION OR COMPLETED

South Portland, Maine.—See annual report, 1934, page 110, and previous reports. See also "Description of Important Works Completed", page 127. The following projects at this depot were completed during this fiscal year: Construction of reinforced-concrete deck on two piers, reinforced chain platform, and roadways, total cost, $46,788; construction of 45-by-80-foot steel, brick, and concrete service and office building, total cost, $61,043; erection of fence around property, total cost, $3,451; driving dolphins at junction of channel and turning basin, etc.; total cost $2,956; purchase of a 5-ton and a ½-ton truck, total cost $3,957; construction of building 28 by 86 feet of cinder-concrete blocks, brick, and steel, for blacksmith shop, garage, and paint room, total cost $8,817; total cost, fiscal year 1935, $27,012.

Whaleback, Maine.—Placed riprap around tower. Work completed. Total cost, $6,576.

Spring Point Ledge and Portland Breakwater, Maine.—See annual report, 1934, page 110. Project completed. Total cost, $6,298.

West Quoddy Head, Maine.—See annual report, 1934, page 110. Project completed. Total cost, $11,877.

Southwest Harbor, Maine.—$30,000 allotted for building new lighthouse depot. Site has been purchased. Cost to June 30, 1935, $10,240.

First district.—Buoys purchased to replace Avery Rock and Blue Hill Bay Light Stations, which were discontinued. Cost to June 30, 1935, $6,379.

Chelsea Depot, Mass.—See annual report, 1934, page 110. (*a*) The wharf area between the easterly side of the west slip and main driveway to the head of the wharf was graded and concrete pavement installed. Total cost, $4,795. (*b*) A steel sheet-piling bulkhead was driven along the westerly side and across the head of the east slip and the slip dredged. Total cost, $22,625. (*c*) The timber wharf was also repaired. Total cost, $4,907. Proposals have been issued for constructing a sheet-pile bulkhead along property line of east slip.

Cape Cod Canal, Mass.—See annual report, 1934, page 111. Ten 18-foot steel towers, and lighting equipment, have been purchased and delivered. Cost to June 30, 1935, $8,587.

Sag Harbor, N. Y.—See annual report, 1934, page 111. Riprap installed around Cedar Island and Sag Harbor Light 3, also skeleton steel towers erected. Project completed. Total cost, $12,500.

Race Rock, Little Gull Island, Orient Point, and Latimer Reef Light Stations, N. Y.—See annual report, 1934, page 111. Riprap installed. Project completed. Total cost, $30,166.

Southwest Ledge and Falkner Island, Conn.—See annual report, 1934, page 111. Riprap installed. Project completed. Total cost, $10,126.

Third district.—Improved fog signals at light stations. Duplicate fog signal engines and air compressors purchased for Falkner Island, Conn., Little Gull Island, and Montauk Point, N. Y. Total cost, $13,090.

Raritan River to Arthur Kill, N. J.—Established Cut-off Channel Lights 1 and 2. Installed riprap for foundations and established four buoys. Project completed. Total cost, $20,690.

Hobucken, N. C.—See annual report, 1934, page 111. Project completed. Total cost, $24,348.

Fifth district.—One lighted buoy was established in place of Cape Lookout Lightship and a lighted bell buoy in place of Cape Lookout Shoal Buoy. Project completed. Total cost, $5,600.

Cape Henry, Va.—See annual report, 1934, page 111. Reinforced concrete fog-signal testing laboratory built. Fog-signal machinery and testing equipment purchased. Project practically completed. Cost to June 30, 1935, $34,915.

Portsmouth Depot, Va.—See annual report, 1934, page 111. Old bulkheads on southern portion of depot have been rebuilt with interlocking steel sheet piling, and concrete decking renewed. Project completed. Total cost, $28,490. Dredging completed, and work of laying concrete decking, and building fence on property recently purchased, is now in progress. Cost to June 30, 1935, $63,997.

Cape Hatteras, N. C.—See annual report, 1934, page 111. New site has been obtained and contract awarded for erection of 150-foot tower and power house. Work substantially completed. Cost to June 30, 1935, $7,491.

Hog Island and Cape Charles, Va.—See annual report, 1934, page 111. Modern plumbing and improved heating systems have been installed in two dwellings at each of these stations. Project completed. Total cost, $12,353.

Cape Lookout, N. C.—Modern plumbing and improved heating systems have been installed in both dwellings. Project completed. Total cost, $6,471.

Fifth district.—Automatic apparatus for major lights. Improved illuminating apparatus and improved fog signals have been installed at three stations. Project completed. Total cost, $6,121.

Chesapeake Bay, Md.—Improving lights and fog signals. See annual report, 1934, page 111. Project completed. Total cost, $7,019.

Chesapeake Bay, Va.—Improving lights and fog signals. See annual report, 1934, page 111. Project completed. Total cost, $5,372.

Portsmouth Depot, Va.—See annual report 1934, page 112. Shops have been modernized and wood and metal working machinery installed. All shop equipment and machinery moved from Lazaretto Depot, Baltimore, Md. Project completed. Total cost, $28,850.

Sixth district.—Lighted buoys. See annual report 1934, page 112, and previous reports. Project completed. Total cost, $40,609.

Charleston, S. C.—Depot office building. See annual report 1934, page 112. Project completed. See also "Description of Important Works Completed", page 128.

Sixth district.—Minor lights, changing 164 oil lantern lights to primary cell flashing electric lights. All illuminating apparatus has been delivered, and installations have been completed in Winyah Bay, S. C., and the Savannah River, Ga. Project substantially completed. Cost to June 30, 1935, $37,717.

Intracoastal Waterway, Fla.—See annual report 1934, page 112. Battery operated flashing lights have been established in Mosquito Lagoon and the Indian River. Cost to June 30, 1935, $17,134.

Cosgrove Shoal Light, Fla.—See annual report 1934, page 112. The tower has been erected and the light established. Project completed. Total cost, $15,050.

Pulaski Shoal Light, Fla.—See annual report 1934, page 112. Work under way. Cost to June 30, 1935, $14,459.

Miami Harbor Lights, Fla.—See annual report, 1934, page 112. Seven of the nine structures have been erected. Cost to June 30, 1935, $15,225.

Key West Depot, Fla.—See annual report, 1934, page 112. Work completed. Total cost, $19,937.

Miami to Cape Sable, Fla.—See annual report, 1934, page 112. Project completed. Total cost, $12,964.

Egmont Key, Fla.—Depot: See annual report, 1934, page 112. Project completed. Total cost, $21,113.

Hillsboro Bay and Tampa Bay, Fla.—See annual report, 1934, page 112. Project completed. Total cost, $23,158.

New Orleans, La.—Depot: See annual report, 1934, page 113. Site has been acquired. The concrete decked wharf, on wooden piles, 30 by 448 feet, has been completed. Contract has been let for erecting a two-story brick storehouse 62 by 112 feet. Cost to June 30, 1935, $151,470.

Galveston, Tex.—Depot storehouse: See annual report, 1934, page 112. Project completed. Total cost, $21,551.

Eighth district.—Buoy in place of South Pass Lightship received. Total cost, $6,670.

St. Andrew Bay, Fla.—See annual report, 1934, page 113. Project substantially completed. Cost to June 30, 1935, $7,745.

Galveston Jetty, Tex.—See annual report, 1934, page 113. Project completed. Total cost, $26,367.

Eighth district.—Improvements to light stations: See annual report, 1934, page 112. Buoy to replace Timbalier Lighthouse has been established. Riprap placed around South Pass West Jetty. Project substantially completed. Cost to June 30, 1935, $13,614.

Mobile, Ala.—Depot: See annual report, 1934, page 112. See also "Description of Important Work Completed", page 128. Pavement inside and outside of building laid. Project completed. Total cost, $59,902.

New Orleans, La., to Sabine, Tex.—Intracoastal waterway: See annual report, 1934, page 113. Project completed. Total cost, $11,124.

Eighth district.—Minor lights: See annual report, 1934, page 112. Project substantially completed. Cost to June 30, 1935, $21,618.

Houston Channel, Tex.—See annual report, 1934, page 112. Project completed. Total cost, $9,678.

Sabine-Neches Canal, Tex.—See annual report, 1934, page 113. Project completed. Total cost, $7,421.

Eighth district.—Storm damages: See annual report, 1934, page 113. Project substantially completed. Cost to June 30, 1935, $30,089.

Sabine Pass Outer Range Lights, La.—See annual report, 1934, page 113. Project completed. Total cost, $6,913.

Point Tuna, P. R.—A new reinforced concrete dwelling was erected to take the place of the old dwelling which was threatened by erosion of the sea. The station was modernized and completely electrified. Project completed. Total cost, $18,161.

Cape Vincent, N. Y.—See annual report 1934, page 113. A wharf about 120 feet long was built of interlocking steel-sheet piling, backfilled with dredged material and a concrete cap poured. A boatslip at the inner end of the wharf was provided, and the boathouse moved. Project completed. Total cost, $28,713.

Oswego, N. Y.—See annual report 1934, page 113, and previous report. See also "Description of Important Works Completed", page 128. Steel lighthouse superstructure, two-family keepers' dwelling, and boathouse completed. Fog signal and light established. Project substantially completed. Cost to June 30, 1935, $28,319.

Thirty Mile Point, N. Y.—See annual report 1934, page 113. Fog-signal building and addition to keeper's dwelling completed. Cost to June 30, 1935, $24,650.

East Charity Shoal, N. Y.—See annual report 1934, page 113. Timber crib, concrete superstructure, and riprap protection completed. Temporary light being maintained. Cast-iron tower lantern, etc., ready for erection. Cost to June 30, 1935, $93,124.

Buffalo, N. Y.—Depot: See annual report 1934, page 113. A protection pier 60 feet long, consisting of a stone-filled timber crib with concrete superstructure, at the entrance to the depot slip was constructed. Project completed. Total cost, $21,500.

Tenth district.—See annual report 1934, page 113. During the year boathouses and slips were completed at Fairport, Ashtabula, and Lorain, Ohio, and a contract awarded for a keeper's dwelling at Fairport, Ohio. Cost to June 30, 1935, $28,724.

South Buffalo, N. Y.—See annual report 1934, page 114. Submarine cable for breakwater extension delivered. Further progress contingent on completion of work by United States engineers, such work now being in progress Cost to June 30, 1935, $11,977.

Cleveland and Toledo, Ohio.—See annual report 1934, page 114. Toledo project completed except for radiotelephone installation; equipment ordered. Cleveland radiobeacon equipment being assembled. Cost to June 30, 1935, $15,808.

Maumee Bay, Ohio.—See annual report 1934, page 113. Work of rebuilding concrete pier completed. Total cost, $14,300.

Sodus Harbor and St. Lawrence River, N. Y.—See annual report 1934, page 113. Foundations constructed and lights completed at Bay State Shoal and Third Brother Island Shoal. Project completed. Changes at Sodus indefinitely postponed. Total cost, $7,473.

Tenth district.—Revision of aids: See annual report 1934, page 114. Tower on west breakwater pierhead, Huron, Ohio, erected, submarine cable laid, lighting and fog-signal equipment assembled. At Conneaut, tower and submarine cable delivered at site and equipment assembled. Work at Fairport and Ashtabula Harbors awaiting completion of work by United States engineers. Cost to June 30, 1935, $46,357.

Monroe, Mich.—See annual report 1934, page 114. Project completed. Total cost, $8,400.

Maumee Bay, Ohio.—See annual report 1934, page 114. Project completed. Total cost, $14,000.

Eleventh district.—Buoys to replace stations and vessels: A lighted bell buoy and carbon dioxide bell-striking equipment has been purchased. Buoy established in Saginaw Bay. Project completed. Total cost, $5,522.

Huron Island, Mich.—Electrify main light and improve living quarters: The work accomplished consisted of the installation of electric generating and storage equipment, making the main light electric, and installing electric outlets throughout the living quarters. Project completed. Total cost, $5,488.

Duluth-Superior Harbor, Minn.—See annual report, 1934, page 114. Project substantially completed. Cost to June 30, 1935, $89,726.

Grand Marais, Minn.—Electrify and improve fog signal: All apparatus has been purchased and is now being installed. Cost to June 30, 1935, $5,497.

Harbor Beach, Mich.—See annual report, 1934, page 114. Project substantially completed. Total cost June 30, 1935, $16,584.

Port Austin Reef, Mich.—See annual report, 1934, page 114. Pier repairs completed. Cost to June 30, 1935, $30,208.

St. Clair Flats, Mich.—See annual report, 1934, page 114. Sites for both range lights and for keeper's dwelling have been acquired. Steel towers for all lights and all wood piling purchased and delivered on the sites. Materials for dwelling being purchased. Cost to June 30, 1935, $13,184.

Spectacle Reef, Mich.—See annual report, 1934, page 114. One hundred and ten interlocking steel sheet piles and 2 corner interlocking steel piles were driven. Project substantially completed. Cost to June 30, 1935, $19,487.

Sault Ste. Marie, Mich.—A site with 254 feet frontage on St. Marys River in Sault Ste. Marie, Mich., has been purchased at a cost of $30,000. Erection of steel sheet pile bulkhead along river front and one slip are in progress. A portable type metal storage building has been erected. Project substantially completed. Cost to June 30, 1935, $59,806.

St. Marys River, Mich.—Beacons: See annual report, 1934, page 114. Installation of acetylene equipment substantially completed. Cost to June 30, 1935, $29,769.

North Manitou Shoal, Mich.—See annual report, 1934, page 114. See also Description of Important Works Completed, page 128. Concrete pier, extending from top of crib at water surface up to main deck, has been constructed, steel building and tower erected, and lighting, fog signal, and radiobeacon equipment installed. Project substantially completed. Cost to June 30, 1935, $152,186.

Peshtigo Reef, Wis.—See annual report, 1934, page 114. Work was begun at the site September 15, 1934, and by June 30, 1935, the portion of structure up to main deck level was finished. Cost to June 30, 1935, $65,859.

Minneapolis Shoal, Mich.—See annual report, 1934, page 114. The timber crib, completed during the previous fiscal year, was sunk on the site and the main 6-foot concrete slab completed. The entire steel frame of the pier building and tower (except lantern) has been erected. Cost to June 30, 1935, $162,265.

Grays Reef, Mich.—See annual report, 1934, page 115. The timber crib was completed and was sunk on the site on September 3, 1934. Nine of the 24 outer pockets of the crib were filled with concrete and the remainder with temporary ballast stone during 1934. At the close of June 1935 this temporary ballast stone had been removed and the pockets filled with concrete. The steel framing is on hand ready for erection, and most of the mechanical equipment has been purchased. Cost to June 30, 1935, $200,585.

Calumet Harbor, Ill.—See annual report, 1934, page 115. Project completed Total cost, $27,185.

Calumet Harbor, Ill.—Breakwater lights: See annual report 1934, page 115. Steel cylinders for foundations, 40-foot skeleton steel towers, and acetylene illuminating apparatus, purchased and ready for erection as soon as the new breakwater has been completed. Cost to June 30, 1935, $5,855.

Manitowoc, Wis.—See annual report 1934, page 115. Project completed. Total cost, $27,329.

Green Bay Channel, Wis.—See annual report 1934, page 115. Steel caisson for the light structure to mark the entrance to Green Bay has been sunk, the main concrete slab placed, and some steel framing erected. Cost to June 30, 1935, $100,320.

South Haven, Mich.—Replace old cable with new electric cable for operation of light and fog signal by city electric power. Repair and recondition single dwelling. Project substantially completed. Cost to June 30, 1935, $6,786.

Milwaukee, Wis.—Depot: See annual report 1934, page 115. Project substantially completed. Cost to June 30, 1935, $14,943.

South Fox Island, Mich.—See annual report 1934, page 115. The discontinued light tower at Sapelo, Ga., was dismantled and reerected at South Fox Island. Project substantially completed. Cost to June 30, 1935, $9,878.

Indiana Harbor, Ind.—See annual report 1934, page 115. The steel tower and forms for the concrete base were acquired. The steel for the elevated walk, the fog signal machinery, and the electric cables were purchased. Cost to June 30, 1935, $30,607.

Port Washington, Wis.—See annual report 1934, page 115. Construction of the light and fog signal tower on the end of the breakwater has been completed. The electric cables have been purchased. Project substantially completed. Cost to June 30, 1935, $37,751.

Mississippi River.—Establish buoys: See annual report 1934, page 115. Project completed. Total cost, $18,937.

Ohio River.—Establish lights and provide buoy replacements: See annual report 1934, page 115. Project completed. Cost to June 30, 1935, $42,473.

Missouri River.—Thirty marine beacon lanterns for replacing oil lighting equipment were purchased. Sixty wooden post light structures were erected above Kansas City. Cost to June 30, 1935, $9,695.

Tree Point, Alaska.—See annual report 1934, page 115. See also "Description of Important Works Completed", page 129. Project completed. Total cost, $47,481.

Sentinel Island, Alaska.—See annual report 1934, page 115. Equipment was installed and the station has been placed in commission. Work, with the exception of some minor details, has been completed. Cost to June 30, 1935, $35,310.

Alaska.—Establish minor automatic aids: See annual report 1934, page 115. Five minor automatic lights on fixed structures, and six lighted buoys have been established. One additional new light on fixed structure is to be established. Cost to June 30, 1935, $14,361.

Reconstruct Five Finger Light Station: See annual report 1934, page 115. Plans were completed during the year for a reinforced concrete light and fog signal building, including keeper's quarters. A permanent derrick and hoist were installed for landing construction materials and for servicing the station after completion. Machinery and other equipment for the light, the fog signal, and the radiobeacon have been ordered. The foundation and the basement walls have been poured. Cost to June 30, 1935, $57,802.

Oregon and Washington.—Lighted buoys: See annual report 1934, page 116. Project completed. Total cost, $33,600.

Puget Sound, Wash.—See annual report 1934, page 116. Waadah Island light and fog signal station was established. Neah Bay light was changed to an electric light. Peapod Rocks light and fog signal was established, and a reinforced concrete tower constructed for Cattle Point light and fog signal. Project substantially completed. Cost to June 30, 1935, $43,157.

Cape Flattery, Wash.—See annual report 1934, page 116. Project completed. Total cost, $17,500.

Desdemona Sands, Oreg.—See annual report 1934, page 115. A new wood pile structure with wood framing and deck, surmounted by a wood frame tower sheathed with asbestos cement sheets was constructed. Commercial power was brought to the station by submarine cable. A semiautomatic electric operated light and fog signal was established and stand-by engine generating sets installed in a small power house on shore for emergency use. Light and fog signal are operated from shore, by remote control, by a part-time caretaker. Project completed. Total cost, $10,592.

Seventeenth district.—Electrify light stations: See annual report 1934, page 116. A carbon dioxide operated fog bell was established on new Willamette River light station structure. Project completed. Total cost, $13,500.

Oregon.—Coast lights: See annual report 1934, page 116. Three coast light stations were completely electrified, including the installation of stand-by engine generating sets for emergency service. Project completed. Total cost, $9,500.

Convert oil lights to semiautomatic: See annual report 1934, page 116. Ten additional minor lights were converted from oil to automatic electric or acetylene lights. Project substantially completed. Cost to June 30, 1935, $7,889.

Tongue Point, Oreg.—Depot: See annual report 1934, page 116. Project completed. Total cost, $19,584.

Pacific coast.—Repairs to various light stations and minor aids on the coasts of Oregon and Washington, which suffered severe damage during the winter of 1934–35. Project completed. Total cost, $30,450.

Punta Gorda, Calif.—See annual report 1934, page 117. Four miles of road were graded and surfaced, and provided with corrugated culvert drains; fences along the right-of-way were constructed. Project completed. Total cost, $31,514.

San Joaquin River, Calif.—See annual report 1934, page 117. Three acetylene lights on timber structures and 10 lighted buoys were established. Project completed. Total cost, $14,868.

Point Cabrillo, Calif.—Power line extended to station; all buildings wired for use of electric current. Fog signal changed to type F diaphone, 20 horsepower electric motor-driven compressor installed, and lens light changed to 500-watt electric incandescent, with motor drive for lens. Project completed. Total cost, $5,560.

California.—Improve fog signals: See annual report 1934, page 117. Table Bluff Light Station and San Luis Obispo Light Station were both wired for use of electric current in towers, quarters, and for fog signals. Lights changed to electric incandescent with motor drive for lenses. Motor driven compressors installed, and signals changed to type F diaphones. Cost, to June 30, 1935, $11,492.

Improve light stations: See annual report 1934, page 116. Thirteen lights in the lower Sacramento River were changed from oil to acetylene. Project completed. Total cost, $20,650.

Additional buoys: See annual report 1934, page 117. Equipment received and placed in service. Project completed. Total cost, $15,064.

Harbor aids: See annual report 1934, page 117. San Diego Bay Entrance Range Lights and Los Angeles Harbor East Breakwater Light and Fog Signal constructed. Project completed. Total cost, $25,896.

Hawaii.—Repairs to depots and stations: See annual report 1934, page 117. The following additional work was accomplished: Telephone line approximately 7 miles in length, connecting Kalae Light Station to the telephone system on the Island of Hawaii, was constructed; approximately 1,175 feet of asphalt paving was laid connecting the end of the Makapuu Light Station road to Territorial highway; two 5 kilowatt generating plants were installed and radio transmitters were made automatic; the structures at Molokai Light Station were wired for electricity, and approximately three-fourths mile of road near the reservation was graded. At Sand Island depot, approximately 105 feet of marine railway track were laid on creosoted ties, and a gas powered winch and a 24-foot wooden boat car provided. Approximately 1½ miles of telephone line were installed, connecting the Nawiliwili Harbor Light Station to the telephone system on the Island of Kauai. The construction of a 40-foot wood tower and service house was started to replace those taken from depot stock for Molokai Point Light. Projects substantially completed. Cost to June 20, 1935, $31,723.

Minor aids and buoys: See annual report 1934, page 117. Project substantially completed. Cost to June 30, 1935, $17,514.

Los Angeles, Calif.—Depot: See annual report 1934, page 116. Keeper's dwelling, fence, and roadways have been built. Project substantially completed. Cost to June 30, 1935, $63,252.

DESCRIPTION OF IMPORTANT WORKS COMPLETED

South Portland, Maine, Lighthouse Depot.—The principal depot of this district was formerly located on Little Diamond Island, about 2½ miles by water from the district office in Portland, Maine, and was found increasingly inconvenient, being remote from the office and accessible only by boat. In 1930 a suitable site was purchased at South Portland and a depot and wharf area provided by enclosing an area with interlocking steel sheet piling and filling with material from the dredged channel connecting the wharves to deep water. Coarse stone was then placed over the entire filled area; a two-story brick-and-concrete shop building 40 by 100 feet was constructed; light and power lines were extended to the piers and a steel frame shed 30 by 180 feet was built; a concrete slab to cover the wharf piers, a concrete chain platform, and concrete roadways, were provided.

A two-story and basement, brick structure 45 by 80 feet to serve as a combined storehouse and office building, was constructed during the fiscal year 1935, also a cinder concrete blacksmith shop and garage 28 by 86 feet, completing the present project.

Charleston, S. C.—Depot office building: Since 1900 the office of the sixth lighthouse district has been located at the historic Old Exchange Building. The building did not adequately meet the needs of the office, and the necessity for modern quarters had been recognized for some time. A modern office building was therefore erected on the depot site on the Ashley River at the west end of Tradd Street, thus concentrating all the activities of the depot and office within the depot area.

The building is two stories in height, 46 by 74 feet in plan. The offices are on the second floor, the rooms on the first floor being used for the most part for the storage of records and office supplies. The foundation is reinforced concrete, resting on piles. The outer walls are solid brick, with cornices and other trim of Indiana limestone. The partition walls are hollow tile and plaster, together with some glass panels to improve the lighting. The girders, beams and floor slabs, as well as the roof slab, are reinforced concrete. The project was completed on January 30, 1935, at a cost of $47,041.

Mobile, Ala.—Depot. In order to provide more suitable and modern headquarters for the Lighthouse Depot at Choctaw Point, Mobile, Ala., it was necessary to replace the present old frame structures on the pier with buildings of fire-resistive construction. In 1930 a bulkhead approximately 90 by 300 feet with earth fill, was erected to form the site for the buildings. During the past year three depot buildings were completed on this filled area. The buildings are of brick with corrugated asbestos roofs. The main depot building is two stories, 62 by 150 feet.

The combined blacksmith and carpenter shop is 50 by 80 feet, one story in height. The acetylene and kerosene building is 40 feet square, one story in height. The foundations are creosoted piles supporting reinforced concrete beams. During this year the office quarters were completed. Reinforced concrete paving has been placed within and without the buildings and plumbing, fire service, and electric wiring provided. The cost of the entire project is $100,561.

Oswego, N. Y.—This project was necessitated because of harbor enlargement and the construction of new east and west breakwaters.

The west breakwater pierhead is a 50 by 50 foot wood crib, stone filled, with concrete superstructure, upon which the main light has been erected. The lighthouse structure consists of a basement formed by concrete walls, with a 30 foot square steel frame superstructure, one and one-half stories high. A tower, also of steel, and about 13 feet square, rises from one corner of the house. The focal plane of the light is 59 feet above water.

The illuminating apparatus is a fourth order fixed lens, with a 500-candlepower electric lamp, interrupted by a motor-driven flasher.

The fog signal is a diaphragm horn. Commercial electric current for the light and fog signal is obtained through a submarine cable. A standby generator and a compressor, operated by gasoline engines, are installed for emergency use.

A radiobeacon is to be installed this season, most of the equipment being now on hand.

A site was purchased near the water front in the city of Oswego, and a two-story brick duplex dwelling was constructed.

A site formerly used by the United States Engineers Department was transferred to the Lighthouse Service, and a boathouse and slip for the station motor boat was constructed. Work is completed except the installation of the radiobeacon. The total cost of the project to June 30, 1935, is $78,319.

North Manitou Shoal, Mich.—This light station replaces the North Manitou Lightship *No. 103* and North Manitou Island Light Station, and serves as an improved mark for the outer end of the shoal projecting southerly from the south end of North Manitou Islands. A substantial saving in annual maintenance cost will be effected. The crib on which the structure is built stands in 22 feet of water, on a hard sand and coarse stone bottom. The crib is 65 feet square by 22 feet deep, and is filled with conveyor stone. The voids around the stone in the 20 outer pockets were pumped full of Portland cement grout. Arch web steel sheet piling driven 24 feet into lake bottom encloses and protects the crib.

The crib supports a hollow pier of reinforced concrete 62 feet square and 20 feet above water, with deck overhanging 2 feet on all sides. This hollow space is occupied by the steam heating plant, coal and oil storage, laundry, etc. Above the pier rises the steel building 37 feet square, two stories high, sur-

mounted by a square tower of three stories additional height. On the top of the tower is a third-order lantern, with its focal plane 79 feet above water. The building and tower are constructed of steel channels 12 and 15 inches wide, standing vertically with flanges turned in and bolted together on the inside. Exterior walls of building and the roof are insulated with rock wool and lined with Portland cement plaster on metal lath.

The illuminating apparatus is a four-panel, 36-inch-diameter revolving lens, fitted with a 1,000-watt electric lamp producing a flashing red light of 240,000 candlepower. Current is supplied from 4-kilowatt Diesel engine-generators with storage batteries. An unattended winter light operated by acetylene gas is provided for use during the closed season.

Two diaphragm horns, one facing up and one facing down the channel, sound, simultaneously, a characteristic of one blast every 20 seconds, of 2 seconds duration. The radiobeacon is synchronized with the sound signal for distance-finding purposes.

The first story of the steel building provides a boat room and power room. In the second story is a large living and watch room, one end of which is occupied by kitchen equipment. The radio transmitter occupies the other end. Four bedrooms are also located on the second floor. The quarters are equipped with electric lights and modern plumbing facilities. The station was constructed at a total cost of $152,186.

Tree Point, Alaska.—A new reinforced concrete light tower and fog-signal building was constructed at this station to replace a deteriorated frame structure. The building consists of one story and basement 18 feet by 36 feet and an attached tower 13 feet square, 58 feet high. The building is modern in design, of simple masses suited to concrete construction and is finished with white Medusa cement, having a pleasing appearance and forming an excellent daymark. The basement contains a 5,000-gallon fuel-oil tank, coal storage bin, air receivers, and hot-water heating boiler. The first floor is used for machinery with the exception of a small office room. The first floor of the tower accommodates the storage battery, the second and fourth floors are used for storage, and the third floor is the diaphone operating room. The total cost of the completed building is $47,481.

COAST AND GEODETIC SURVEY

REVIEW OF THE YEAR

The volume of work accomplished during the fiscal year 1935 far exceeded that of any other year in the Bureau's history.

This achievement resulted from the fact that the regular appropriation for the year was supplemented by grants of Public Works Administration funds. Whereas the last normal appropriation, that for 1932, was some $3,075,000, for 1935 there was available for expenditure a regular appropriation of $2,206,968 plus Public Works Administration allotments of $5,104,009, making a total of $7,310,977.

In carrying on the work financed by this unprecedented total the quality of results was held strictly to the exacting standard which normally characterizes the Bureau's operations. The volume of work accomplished was fully commensurate to the amount of money spent. This fact is strikingly confirmed by the following table showing, for the years 1929 to 1935, inclusive, the amount of work done on the principal technical operations to which the Bureau's funds are devoted.

Principal results accomplished, 1929–35

Year groups	Hydrography		Topography	Triangulation			Reconnaissance	Leveling		Gravity observations
	Soundings	Sounding lines		First order	Second order	Coastal		First order	Second order	
	Number	*Miles*	*Miles of shoreline*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Number*
1929	846,517	74,481	1,726	1,200	85	878	2,155	1,290	.....	13
1930	780,049	71,433	2,273	1,430	.....	863	885	727	.....	7
1931	782,044	75,696	2,472	2,895	.....	812	2,720	5,737	156	.....
1932	767,322	72,186	1,959	3,490	.....	803	5,950	5,945	1,555	35
Total	3,175,932	293,796	8,430	8,925	85	3,356	11,710	13,699	1,711	55
1933	1,387,027	103,344	4,407	3,625	.....	2,476	4,350	11,324	2,940	148
1934	2,520,406	110,045	14,877	7,440	1,080	1,960	8,810	16,153	28,670	118
1935	3,523,749	138,382	20,330	14,113	3,335	2,574	23,715	10,713	113,980	170
Total	7,431,182	351,771	39,614	25,178	4,415	7,019	36,875	38,190	145,590	436

This table compares the results accomplished during the 3 years 1933–35, during which emergency relief funds were available, with the preceding 4 years when the work was financed exclusively by the regular appropriations. Comparing 1932 and 1935, it will be seen that, whereas funds for the latter year were about 240 percent of those for the former, the work accomplished in 1935 was in a much greater ratio to that of 1932. No attempt is made to fix the exact ratio because there is no common yardstick for measuring accom-

plishment in such diverse fields as hydrography and triangulation or leveling. In a general way, however, it is obvious from the table that the amount of work accomplished in 1935 was several times as much as that of 1932.

In this conduct of work under a combination of regular appropriations and emergency allotments, the regular appropriations, by far the greater part of which were for the pay of the permanent Survey personnel, furnished the foundation upon which the part financed by emergency allotments rested as a superstructure. All projects undertaken consisted of work which previously had been authorized by the Congress and was in course of performance under regular appropriations. Accomplishments of the past 3 years mean that for a considerable period hereafter the Bureau's appropriations can be less than would otherwise be required. It is estimated that as a result of this work future appropriations for a considerable period can be some $300,000 less than was provided in 1932 without detriment to the public service with which the Bureau is charged.

Now that the work has been terminated, it is desirable to appraise the extent to which it fulfilled the expectation on which it was undertaken.

RELIEF OF UNEMPLOYMENT AND ECONOMIC DISTRESS

This was the primary purpose of the emergency allotments under which the Bureau has been working. These projects have demonstrated that surveying and mapping lend themselves admirably thereto.

In seeking the initial allotment the Bureau predicted that approximately 70 percent of the total amount spent in carrying on field surveying projects would be devoted to direct employment of labor. At the close of the project we find that the actual figure was 69.4 percent.

The number of persons employed varied somewhat from time to time, a special effort having been made to employ the maximum number during the winter months. The average for the entire period was about 2,350 persons. The great majority of them were of the white-collar class. Sixty percent were men of college training. The jobs given them were not white-collar jobs. Graduate engineers and others of comparable status were glad to get jobs as recorders, rodmen, truck drivers, and other subprofessional employments incident to surveying work. Their morale was exceptionally high. They were encouraged to feel that they were employed on useful and necessary work where they were giving the public 100 cents of value for every dollar spent. Their response was all that could have been desired, as is amply indicated by what has already been told regarding the volume of work accomplished.

Another contribution to the relief of economic distress derived from work of this character results from its wide geographic distribution. Work was performed in every State in the Union and almost entirely in the rural districts. Expenditures for subsistence of the parties, which the men pay from their own salaries, and the 15 to 18 percent of the total allotment which was devoted

to operating expenses, were spent in many small communities where they provided a material stimulus to retail trade.

The remaining 12 to 15 percent of the cost of field work was devoted to purchase or rental of equipment, to travel, and other administrative expenses.

PUBLIC VALUE OF THE PROJECT

The money spent was devoted to the following purposes:

1. Surveys to modernize nautical charts.
2. Extension of control surveys in the interior.
3. Tidal, magnetic, and seismological surveys.
4. Office processing of data resulting from the foregoing field operations.
5. Maps for the guidance of aircraft.

1. Fringing the Atlantic coast from New York to the Mexican border is a system of natural waterways; bays, sounds, and lagoons, linked together almost continuously by narrow, tortuous tidal channels. These waters support an extensive motor-boat traffic carrying local products to centers of distribution, other traffic incidental to the sea-food industry, for which the waters are famous, and for pleasure purposes. The growing importance of these waters has resulted in their extensive improvement under river and harbor appropriations, and when the projects now approaching completion are finished vessels having a draft of not exceeding 7 feet can proceed all the way from Delaware Bay to Miami, while from Choctawatchee Bay to Corpus Christi on the Gulf coast a controlling depth of 6 feet will be available with 9 feet available over the greater part of the route.

The existing charts of this system of waterways have been based principally on surveys made from 60 to 80 years ago and, necessarily, are obsolete in many respects. Mariners can derive full benefit from the millions of dollars which are being spent in the improvement of the waterways only if those improvements are shown on the charts. For the past several years, therefore, the Bureau has been urging that funds be provided for this purpose. The granting of Public Works Administration funds provided the needed opportunity. Through their use, while the entire area has not been surveyed, by concentrating on the through route and its most important tributaries, sufficient field surveys have been made so that charts of the entire route can be produced. Numerous other needed harbor revision or other local surveys were made, notably along both coasts of Long Island and the north shore of Long Island Sound. On the Pacific coast surveys were made around the islands off the coast of southern California. The newly improved channel for ocean-going vessels in the Sacramento and San Joaquin Rivers was surveyed and charted. Important and difficult wire-drag work along the outer coast was carried on to assure greater safety to coastwise shipping which, in stormy weather, follows the coast as closely as possible.

Use of emergency funds for employment of men on our sea-going surveying vessels made it possible to keep the entire fleet in operation throughout the year, except one vessel in the Philippine Islands. Along the Atlantic and Pacific coasts of the United States these vessels were employed on revision surveys of the continental shelves

necessitated by the recent developments in methods of navigation based on echo sounding. In Alaska two vessels continued work on the first survey of the Aleutian Islands.

2. For more than half a century the Bureau has been engaged in a small way in spreading its networks of control surveys (triangulation and leveling) over the continental United States. These surveys are of value to every kind of engineering work which requires accurate knowledge of distances, directions, and elevations on the earth's surface. Their principal Federal purpose, however, is to assure the accuracy and reduce the cost of producing the topographic map of the United States. In 1925 Congress passed the Temple Act which authorized completion of the control surveys and the topographic map within 20 years. Unfortunately, however, enactment of this legislation has had little practical effect on the situation, because the increased appropriations required to give effect to it never were made. Under Public Works Administration funds work on the control surveys was largely expanded. Today that part of the goal contemplated by the Temple Act, namely, that in general no point in the United States would be more than about 12 miles from a permanently marked point whose geographic position and elevation are known, is within sight of accomplishment. The necessary leveling is substantially completed, and about 2 years more of triangulation at the 1935 rate will complete the basic horizontal control.

3. Small sums were devoted to tidal, magnetic, and seismological work. The tidal work consisted of tide and current surveys of waters where the data obtained were needed in the interest of navigation or of marine engineering work.

One magnetic field party was kept continuously in operation measuring the direction and strength of the earth's magnetic field, thereby acquiring information needed by the mariner and the land surveyor in their use of the magnetic compass. Some urgently needed renovations of magnetic observatory buildings were made.

A small allotment supported an extensive but very important project in earthquake investigations. This was designed to promote the safety of life and property by determining the stresses to which large buildings, dams, bridges, and other monumental structures will be subjected when close to the center of a severe earthquake. The work involved measurement of the stresses transmitted through the ground and the response of different types of structures to the stresses which reached them. The results of the completed study are expected to furnish data which will enable engineers and architects to design at reasonable cost structures which will resist any stresses which may be expected in a major earthquake. Instruments have been designed and installed at strategic points where they stand ready for the occurrence of a severe shock, when they will record the ground motions which it produces. Other instruments are being used to measure the characteristic vibrations of structures. For this purpose it is not necessary to await an earthquake. Vibrations produced by the wind, by passing traffic, by the firing of explosives, and by other artificial means serve the necessary purpose. The project must be continued for some years before results of assured value can be expected, but since future costs will be limited

largely to the servicing of instruments heretofore installed it is expected that with some non-Federal cooperation the work can be continued without necessitating appropriations in excess of the more generous ones heretofore made.

4. The field operations heretofore briefly described produce certain raw materials. These raw materials must be delivered to the Washington office and there pass through a finishing process before the public can get any benefit from them. If they cannot be transformed into the charts, maps, and other publications which are the final product of the Bureau's work, there is no possible justification for doing the field work to which the greater part of their total cost is devoted.

This office work necessarily must follow the field work; in fact, in general little progress can be made on the office work until the field work has been completed.

The projects as originally set up made provision for this processing. It was so planned that the field work should begin to taper off early in the spring of 1935 so that the office work would be completed by the end of the fiscal year, when the money would be exhausted. However, on request, these original plans were modified, both to increase the volume of field work with the employment incident thereto and to continue the work at the augmented rate until the end of the fiscal year. In consequence, when the work was terminated for lack of funds there was on hand a very large volume of raw material to be processed.

Application has been made for additional funds to take care of this work, but to date approval thereon has not been secured. If such approval is not given, much of the money spent for field surveys will have been wasted, because the office force supported by the regular appropriations cannot possibly deal with the accumulation within a reasonable time, and results of work costing hundreds of thousands of dollars will have become obsolete before it can be given to the public.

5. The airplane pilot, like the mariner at sea, needs charts to guide him on his journey. The Air Commerce Act of 1926 vested in the Secretary of Commerce the duty of providing such charts, and the task was delegated to the Coast and Geodetic Survey.

The first work undertaken was to produce a series of strip maps extending from one important airport to another. Development of aviation, however, resulted in a very great increase in the amount of miscellaneous cross-country flying, and eventually it became apparent that the principal need was for charts covering the entire United States. Production of these maps was begun in November, 1929.

In the spring of 1934 the Department proposed a Public Works project for completing the series by June 30, 1935. The project was approved in October 1934.

If the standard topographic map of the United States had been available, it would have been a simple task. However, it was necessary to compile maps from a great mass of heterogeneous and conflicting information, and the resulting product was of such uncertain value that the Bureau did not dare ask the aviator to risk his

life by accepting it. Therefore, as each section of the map was compiled in the office it was turned over to an observer in an airplane and the observer compared the visible features on the ground with those shown on the map. In this way many inaccuracies were corrected. It should be emphasized, however, that not until the standard topographic map has been completed can this special product attain to the quality which the Bureau considers essential.

At the end of the fiscal year all charts of the series had been compiled, and all but 2 within the limits of continental United States and 8 along the Canadian border had been flight checked. Forty-one out of a total of 87 had been published. It is expected that the remainder will be published early in the fiscal year 1936.

IMPROVEMENTS IN EQUIPMENT

The efforts of the Bureau to increase the economy and efficiency of its operations through the development of improved methods and equipment were continued during the year with good results.

The shallow-water fathometer, now called the "Dorsey Fathometer", under development by the Bureau, as mentioned in last year's report, was installed on two survey ships, where the difficulties inherent in the development of a device of this nature were corrected as they arose during actual field use. This apparatus is now working quite satisfactorily in depths from 9 to 120 feet under the keel. Echo-sounding instruments previously in use have been remarkably effective in reducing the costs of hydrographic operations but, on account of limitations of accuracy, have been restricted to depths greater than about 90 feet. The value of this new apparatus, which will at least double the output of work formerly possible in the extensive areas where lesser depths occur, is obvious.

Experimental work on the velocity and path of sound in sea water in radio acoustic ranging, developed by this Bureau for offshore hydrographic surveying, was continued on the ships *Pioneer* and *Guide* off the coast of southern California, and by the *Oceanographer* and *Lydonia* off the Atlantic coast.

Echo-sounding and radio-acoustic equipment and methods are of inestimable benefit to the Bureau and to the users of its nautical charts, making it practicable for the first time to carry on hydrographic surveys, especially in offshore areas, with the accuracy and detail now required for modern navigation.

The report of this Bureau for last year included a brief description of a proposed 9-lens camera developed by the Bureau for increasing the accuracy and efficiency of aerial phototopography. This camera is now under construction and should be available in the near future.

A ruling machine was designed and is now in use that insures accuracy in the construction of the basic framework or projection of survey sheets and charts, tying together the geographic positions, soundings, and related charting data with greater speed than was formerly possible. Projections are prepared on celluloid for field airphoto reductions, on aluminum-backed drawing paper for cartographic compilations, and on copper plates for chart engravings.

Improvements to accelerographs for the study of strong earthquake motion, producing records more accurate and easier to interpret, have made it possible to record earthquakes of all degrees of intensity. A vibration meter was developed by which the periods of buildings and various other structures such as bridges, dams, and elevated tanks, were measured, and portable shaking tables for testing these instruments were developed.

In terrestrial magnetism the aim has been to secure instruments by which the desired observations may be made available in published form at least cost. This is being accomplished by the development of new instruments and by exhaustive studies of existing ones.

A new offset press, a vacuum printing frame for use in the transfer of negative work to the printing plate, and more photostat equipment were added during the year.

A number of improvements in instrumental equipment were developed in the shops of the Division of Instruments, by members of the Division and other officers of the Bureau. The Division also accomplished a great amount of extra work in the procurement and maintenance of instruments and equipment as required for the emergency work of the Bureau.

Notable among the improvements in equipment are:

1. The adaptation of commercially manufactured tapered roller bearings in the vertical axes of the most precise type of theodolites. With a small amount of added finishing to insure the maximum precision, they furnish a low-friction bearing, and initial tests disclose as great a precision as any heretofore used, with the added advantage of being reasonably free from the effects of temperature and of changes of viscosity of the lubricant.

2. A permanent and precise method of testing the graduated circles for precision theodolites and similar instruments, by the use of a testing stand and a set of 5 collimators erected in the Commerce Building basement.

3. A change in the design of the standard tide gage, permitting easy and quick adjustment of the float, counterpoise, and recording pencil, without the use of tools.

4. The construction of two new units of the Brown portable gravity apparatus, containing a new design of the precision knife-edge support of the pendulum to guard against change in the length and, consequently, of the constant when lifting and resetting the pendulum from its support at each observation.

COOPERATION WITH OTHER AGENCIES

Extensive cooperation, producing mutually beneficial results, was maintained with a large number of governmental and private agencies in this country and abroad.

There was the usual cooperation with the United States Geological Survey in the extension of triangulation and leveling to meet its needs for control in areas where topography is being executed.

For the Corps of Engineers, United States Army, triangulation was extended along the Atchafalaya River in connection with its

flood-control work, and at numerous times data with respect to the extensive coordinating coastal triangulation were furnished various Army Engineer districts. The Bureau also expedited the computation and adjustment of the detailed triangulation and traverse along the Mississippi River, which is being published by the Corps of Engineers, being assisted by additional computers provided by that Corps.

At the request of the United States Forest Service, second-order triangulation was extended over the Superior National Forest in Minnesota, and lines of second-order leveling were run in certain areas in New Mexico and Arizona. Control data were also furnished the Forest Service for the control of its topographic surveys of the forest reservation north of Charleston, S. C., and request was received for the latitudes and longitudes of a number of lookout towers in the West.

Vessels operating off the Virginia capes obtained observations to check distance finding from the synchronized radiobeacon and diaphone signal on Chesapeake Lightship. Hydrographic surveys were also made of Frying Pan Shoal and of the entrance and approaches to Hatteras Inlet for the Lighthouse Service to determine the present channels and their stability for placing aids to navigation.

Hydrographic surveys were made for the Bureau of Fisheries and advance copies of the data of various bays and sounds along the Gulf coast were furnished in connection with the study of fish culture.

For the purpose of conducting trial tests of vessels under mail contracts in connection with the classes to which various vessels must be allocated as to speed, this Bureau cooperated with the Post Office Department by measuring and laying down a speed trial course 1 nautical mile in length off Southwest Pass of the Mississippi River. Range beacons marking the ends of the course were erected on the Delta in the vicinity of Burrwood, La., by the party on the *Hydrographer*, and an officer was assigned from time to time to assist in conducting the tests.

Tide-prediction data were exchanged with England, Germany, France, Canada, and India. Primary tide gages were maintained on a cooperative basis by the United States Army Engineers at 4 stations, by the United States Navy at 6 stations, and the Woods Hole Oceanographic Institution and the Oceanographic Laboratory of the University of Washington, 1 station each.

One of the cooperative projects, requested by the Soil Erosion Service and the Bureau of Reclamation, consisted of leveling and triangulation of an accuracy better than first-order over the area adjacent to Boulder Dam and the reservoir, for the purpose of determining through repeat observations from time to time any deformation in the dam's structure and the earth's crust due to the water load which will result from filling the reservoir.

At the request of the Tennessee Valley Authority the 25-mile spacing of the triangulation and leveling over the area under its jurisdiction was expedited, and office computations and adjustments completed promptly. Extensive data, resulting from field surveys were also furnished to a considerable number of other governmental agencies engaged in recovery measures.

Additional lines of levels were run across fault zones in southern California, with bench marks more closely spaced than heretofore, at the request of the committee on seismology, Carnegie Institution of Washington. Cooperation with the Institution includes the development and testing of instruments, the maintenance of magnetic standards, the interloan of instruments, and combined activity producing results which otherwise could not have been accomplished. At the Bureau's magnetic observatory at Tucson, atmospheric electricity observations are thus carried on, and also earth current work, the latter through cooperation with the Mountain States Telegraph & Telephone Co. At Cheltenham, a cosmic ray meter was operated at the request of Carnegie Institution of Washington.

Interpretation of the scientific significance of its records, relating to terrestrial magnetism, while part of the Bureau's duties cannot be carried very far with the limited personnel available. This gap is in part filled by studies of records by the National Bureau of Standards, Naval Research Laboratory, National Broadcasting Co., division of terrestrial magnetism of the Carnegie Institution of Washington, and others in connection with radio studies, and by the Carnegie Institution of Washington in fundamental studies in magnetism. Part of the latter work is done by research associates of the Institution in England and Germany.

In seismology cooperative activities are country-wide and are very effective. Collaborators include the United States Weather Bureau, National Bureau of Standards, postmasters in earthquake regions, various Jesuit institutions, and many universities, other organizations, and individuals. Valuable assistance in conducting certain tests of buildings and other structures was rendered by the Navy Department and the Procurement Division of the Treasury.

Without interfering with its regular surveys, the Bureau cooperated with the Geological Society of America in an interesting project to determine the depth of the basement rock beneath the Atlantic continental shelf. The submerged plain east of the Virginia Capes where survey vessels were operating was selected for these experiments. The work was undertaken by a member of the faculty of Lehigh University under a grant of funds from the society, aided by an officer of this Bureau familiar with the seismic and marine problems involved. The reflection method regularly used in seismic prospecting for oil was adopted, with both the explosives and the seismographs on the sea bottom. During the 2 weeks the work was in progress a successful technique was developed indicating that data could be obtained at sea of the required accuracy on any continuing future program by the society.

MISCELLANEOUS DATA

There were received in the library and archives, 404 hydrographic and 793 topographic sheets, each representing new Bureau surveys. Other additions were 1,109 blueprints (mostly surveys by Army Engineers); 4,518 maps; 3,564 charts; 30,523 field, office, and observatory records; 138 negatives; 261 prints; 128 lantern slides; 1,314 books; and 4,150 periodicals.

A total of 3,582 employees was serving the Bureau on June 30, 1935, shown in the table following, compared with 2,691 in 1934 and 2,024 in 1935:

Staffs	Commissioned	Civilian				Staff total		Total
		Classified	Unclassified					
			Laborers	Seamen	Hands	Washington	Field	
Regular appropriations:								
Washington office	14	230	3			247		247
Field service	156	62		[1] 521	[1] 88		827	827
Total	170	292	3	521	88	247	827	1,074
Public Works funds:								
Washington office		517				517		517
Field service		189			1,802		1,991	1,991
Total		706			1,802	517	1,991	2,508
Grand total	170	998	3	521	1,890	764	2,818	3,582

[1] Includes 40 civilian employees on duty at the Manila field station and 50 members of the crew of the ship *Fathomer*, paid by the Philippine insular government but under the jurisdiction of this Bureau.

The regular appropriations for the year totaled $2,126,061. These were supplemented by allotments of $11,536 from "Air Navigation Facilities, 1935", $300,000 from "Public Works Administration, 1935", and $1,489,800 from "National Industrial Recovery, 1933–35." In addition to these sums, there was available an unexpended balance on account of "Air Navigation Facilities" allotted during the fiscal year 1934.

Collections on account of the sale of nautical charts and other publications, deposited in the Treasury Department to the account of miscellaneous receipts, totaled $76,575.14, as compared with $72,621.50 during the preceding year, an increase of nearly 5½ percent.

Disbursements during the year ended June 30, 1935, totaled $7,017,082.64, distributed among the various appropriations as follows:

Pay and allowances, commissioned officers, 1934	$68,886.70
Party expenses, 1934	97,250.00
Repairs of vessels, 1934	10,653.77
General expenses	35,684.04
Pay, officers and men, vessels, 1934	100,929.78
Air navigation facilities, 1934	638.75
Pay and allowances, commissioned officers, 1935	626,033.91
Salaries, 1935	505,816.54
Party expenses, 1935	293,635.87
Repairs of vessels, 1935	49,871.63
General expenses, 1935	42,145.54
Pay, officers and men, vessels, 1935	353,968.64
Air navigation facilities, 1935	11,080.03
National Industrial Recovery, 1933–35	4,594,304.37
Public Works Administration, 1935	224,089.12
Chicago World's Fair Centennial Celebration	682.17
Second polar year program (State transfer to Commerce Department) 1932–34	1,388.42
California Pacific International Exposition	23.36
Total	7,017,082.64

CHARTS

With modern surveys supplying the new and more detailed information required for ships of today, as well as a more comprehensive knowledge of the changes which are constantly taking place along our coasts, there was a steady advance in new and revised editions of nautical charts. Sixteen new charts were published during the year, making a total of 766 nautical charts of different areas and various scales now issued. A total of 155 revised editions was also published during this 12-month period.

The gradual increase in the demand for this one product alone is illustrated by the following tabulation of annual chart issues for certain years. It may be noted that the issue for 1935 is only 1,934 less than the maximum annual issue resulting from the World War, which at that time was thought to constitute an all-time peak:

Average pre-war annual issue	109,290
Maximum issue resulting from World War (1920)	311,699
Minimum post-war issue (1923)	197,426
Minimum issue during depression (1933)	241,894
Issued during 1935	309,765

The Survey has endeavored constantly to simplify these charts and at the same time make changes and additions improving their usefulness to the maritime public. New features incorporated during the year include:

Track lines for full-powered steamers, printed in red on general charts of the Pacific coast.
Isogonic lines in purple, on certain sailing charts.
More distinctive marsh areas on large-scale charts.
A blue tint for water areas shoaler than 18 feet.
A new arrangement showing temporary changes to navigational aids.
Scale divisions changed to the decimal system, replacing the old fractional division.

As the surveys of our coasts required for charting purposes have been carried on almost continuously since 1816, they have many by-product uses of importance. These include references to office records and previous surveys for official information at different periods with respect to the location of shorelines, low-water lines, details of depths, and the like.

Every safety aid, whether it be for transportation over the air or sea, expedites progress and the increase of over 128 percent within 2 years in the number of the Department's aeronautical charts used, indicates their value to air transportation.

Great strides were made during the year toward the completion of this series of specialized charts—virtually one large map of the United States, issued in 87 sections. With the augumented staff available, the initial flight checking of all of the charts was completed and during the year 16 new charts and 52 revised editions of existing charts (section and strip) were produced by the Survey, making 41 of the 87 required now available.

The constantly accumulating data with respect to changes in beacons, radio ranges, or airports, of importance to air navigation, changes wrought by man and nature that should be known to the mariner, are of practical value only when they appear on the chart. The reliability of any chart becomes impaired, therefore, unless revised editions are issued when needed.

24516—35——12

Nautical and aeronautical charts again greatly exceeded the number used in the preceding year as shown in the following table of charts and related publications:

Item	1935	1934	1933
Nautical charts [1]	291,300	273,816	224,139
Coast and route pilots	7,020	8,073	5,515
Tide and current tables	29,572	32,503	31,609
Tidal current charts	1,705	701	958
Aeronautical charts	67,106	47,685	29,369

[1] Including Manila office.

HYDROGRAPHY AND TOPOGRAPHY

All the hydrographic and topographic work of the Survey, including the collection of data for Coast and Intracoastal Waterways Pilots, is done under the supervision of the Division of Hydrography and Topography.

Two large sea-going vessels, the *Oceanographer* and *Lydonia*, and two tenders, the *Gilbert* and *Welker*, were engaged on offshore work along the Atlantic coast. Off the Louisiana coast, the *Hydrographer* and two tenders, the *Faris* and the *Pratt*, carried on similar work. During the progress of this work several deep submerged valleys—probably former river courses—indenting the Atlantic continental shelf were discovered and adequately surveyed. These interesting submarine topographic features not only furnish the mariner with definite means of position-finding well offshore, but supply the geologist with data of value in studying original land forms. One discovered last season indenting the shelf 60 miles off the Virginia coast was traced during the present season 60 miles beyond the edge of the shelf to a depth of 1,500 fathoms (9,000 feet), indicating an apparent change of that amount at some geologic period in the relative elevation of sea level and the continent.

Entirely new surveys were made of the principal changeable areas of the intracoastal waterways along the Atlantic and Gulf coasts, from New York to Corpus Christi, and the construction of larger scale charts is now in progress. This accomplishment does not reduce the regular appropriations necessary for Bureau work during a normal year. It simply means the accomplishment with relief funds of work sorely needed for many years to modernize charts, previously beyond the means of the Bureau's normal appropriations. Fourteen shore parties were engaged on this work during the year.

On the Pacific coast two vessels, the *Guide* and *Pioneer*, engaged on offshore surveys along the California coast, two shore parties accomplished inshore work along the California coast, and around off-lying islands, and one party carried on wire-drag operations for the detection of pinnacle rocks inside the 20-fathom curve along the coast. The *Guide* also made several detached surveys in the vicinity of San Francisco Bay. The *Explorer* carried on combined operations in the Puget Sound area, including triangulation of first-order accuracy over the Seattle metropolitan area.

In Alaska and in the Philippine Islands only regular appropriations were allotted for field surveys. In Alaska, the *Surveyor* and

Discoverer, with several tenders, continued the surveys of the Aleutian Islands, to the westward from Unimak Pass. This work was started in 1934, as the beginning of a complete and comprehensive survey of that chain. In the Philippines, the steamer *Pathfinder* was continued in a decommissioned status. The Philippine civil government steamer *Fathomer* continued surveys on the northeast coast of Luzon Island and the west coast of Palawan Island. While surveys of the former area are practically complete, those of the Palawan coast require several years for completion. These two surveys are the only areas remaining to complete the initial surveys of the entire Philippine Archipelago. About 10,000 square miles of offshore work also remains to be done in the southern part of the Sulu Sea, north of the International Boundary.

United States Coast Pilots and Intracoastal Waterway Pilots, which furnish reliable information to the mariner that cannot be shown on charts, are revised at intervals of 6 to 7 years. Field examinations were made during the year for a complete revision of United States Coast Pilot, Atlantic Coast, section D, Cape Henry to Key West; United States Coast Pilot, Gulf Coast, Key West to the Rio Grande; and the Intracoastal Waterways Pilots, New York to Key West, and Key West to the Rio Grande.

The work done by the Division of Hydrography and Topography during the year ended June 30, 1935, is listed in the following table:

Hydrography, topography, and coastal triangulation

Locality	Hydrography			Topography		Coastal triangulation		
	Sounding lines	Area	Soundings	Shoreline	Area	Length of scheme	Area	Geographic positions
	Miles	*Sq. mi.*	*Number*	*Miles*	*Sq. mi.*	*Miles*	*Sq. mi*	*Number*
Bar Harbor to Penobscot Bay, Maine						150	3,500	400
Boston and Cape Cod, Mass	1,548	126	44,385	54	22	94	617	471
Buzzards Bay to Housatonic River, Mass., R. I., Conn	3,141	148	115,435	308	193	150	722	950
Vicinity New York City and Long Island, N. Y. and N. J	5,887	902	215,486	2,254	645	99	339	282
Hudson River, N. Y	746	35	25,359	90		52	52	346
Metedeconk Neck to Cape May, N. J	1,748	49	86,789	331	141	81	335	94
Delaware River, N. J						14	9	130
Chesapeake Bay, Md	3		169	699	369	40	92	78
Ocean City to Virginia Beach, Md. and Va	14,528	9,160	174,443	10	4	20	46	37
Nansemond and Back Rivers, Va	182	9	12,125	63	26	18	80	71
North Landing to Neuse River, Va. and N. C	6,495	205	218,699	1,260	322	253	1,286	514
Wilmington to Charleston, N. C. and S. C	4,192	191	170,185	2,163	1,369	35	120	57
Charleston to Fernandina, S. C., Ga., and Fla	2,227	136	66,825	1,980	2,177	70		54
Fernandina to Titusville, Fla	6,150	242	284,442	649		187	642	460
Port Everglades to Key West, Fla	12,186	1,019	436,006	494	130	222	1,620	440
Apalachee Bay to Mississippi Sound, Fla., Ala., and Miss	12,751	612	383,789	4,335	2,980	514	4,727	790
Mississippi Delta to Port Arthur, Miss., La., and Tex	17,225	5,302	317,791	1,753	681	9	60	26
Galveston Bay to Corpus Christi, Tex	7,640	773	249,785	2,369	1,235	10	40	21
Mexican Border to Estero Bay, Calif	14,503	2,860	241,349	330	267	34	128	57
Estero Bay to San Francisco, Calif	3,372	299	82,294	166	49	15	4	78
Columbia River, Oreg	716	42	25,558	150	32	50	226	927
Puget Sound, Wash	3,489	188	114,633	320	90	123	254	166
Aleutian Islands, Alaska	10,592	12,090	99,148	408	194	313	1,344	363
Balabac to Luzon, P. I	9,061	1,382	159,054	144	163	21	166	268
Total	138,382	35,770	3,523,749	20,330	11,089	2,574	16,409	7,080

Many of the topographic surveys were compiled from aerial photographs. These serve admirably for the construction and correction of nautical charts, and are also used extensively by engineers for projects for which preliminary surveys would otherwise be necessary. Requests often come from commercial companies for copies of these maps before the originals are received from the field for reproduction.

Eight compilation parties, operating from temporary offices in various cities along the Atlantic and Gulf coasts, and one party in southern California, were engaged on this class of work during 1935.

Under the emergency allotments a total of 15,647 square miles of phototopography was accomplished, 9,598 square miles during the present fiscal year and 6,049 square miles in 1934. This work was done in highly developed regions, such as the area along the north shore of Long Island Sound, from New York to Bridgeport, and over the intricate waterways along the Atlantic and Gulf coasts, all representing the highest type and most expensive class of topographic work by the old ground methods.

All these survey projects for modernizing nautical charts were rigidly controlled by an intensive net of coastal coordinating schemes of triangulation, aside from the basic arcs which cover the interior of the country. Basic control stations were established along the greater part of the Atlantic and Gulf seaboards, from Eastport, Maine, to Corpus Christi, Tex., along the lower California coast, and the greater part of the Puget Sound area. Since all stations were permanently monumented, this work is available for revisional surveys for many years to come.

GEODESY

Horizontal and vertical control surveys, consisting of triangulation and leveling, and related measurements, including office computations and adjustments, necessary for all hydrographic and topographic activities, are extended throughout the United States under the supervision of the Division of Geodesy.

All but a small portion of the geodetic field work was devoted to the extension of the control nets of triangulation and leveling toward the goal, where eventually no place in the country will be more than about 12 miles from a triangulation station and a bench mark.

Through the use of emergency funds and the regular annual appropriation, 76 leveling instruments and 51 theodolites were kept in daily operation, resulting in the addition of over 17,000 miles of triangulation and over 124,000 miles of leveling to the control nets. These amounts exceed by more than 100 percent the totals for the previous year, which up to that time had been the highest for any like period in the Bureau's history. At the end of the year the triangulation net was composed of 65,000 miles of arcs, and the leveling net comprised 253,000 miles of lines.

The control surveys are the framework for detailed mapping and charting. They furnish basic positions, elevations, distances, and directions needed for nautical and aeronautical charts published by

the Coast and Geodetic Survey. Most engineering operations depend upon one or more classes of these data. The increased requests for data evidence the growing demand on the part of engineers and surveyors for accurate geographic positions and elevations.

In extending triangulation over the country, the rather complicated computations and adjustments necessarily have to be made on the basis of the curved surface of the earth. Engineers engaged on local projects are not familiar with the resulting so-called "spherical coordinates" and hesitate to use them. This difficulty has been overcome by devising plane coordinate systems for each State, treating a State area as one or more single-plane surfaces. While a single surface can be used for a number of States, as many as six surfaces are employed for some of the larger States. The adjusted geographic positions of triangulation stations in 22 States have been transformed into plane coordinates, from tables for reducing the spherical coordinates. These tables are available for public use.

Base-line measurements, varying from 4 to 10 miles in length, depending on the character of the country, furnish the lengths of triangle sides at intervals of 100 to 200 miles along arcs, to control the distances between stations of the triangulation.

A base is measured with the utmost care, and the probable error of the length is seldom greater than 1:1,000,000, or a small fraction of an inch per mile. This extreme accuracy obtained at moderate cost is needed in order that the computed lengths of the triangle sides may be of high order. Invar tapes, having a very small coefficient of expansion, are used, after being standardized at the National Bureau of Standards.

The astronomical work carried on is designed to furnish Laplace or true azimuths referred to the spheroid, for use in the adjustment of arcs of triangulation. As a triangulation arc tends to swerve to the right or left even though angle measurements are made with the greatest precision possible, the true azimuths keep true positions and directions and add to the strength of the triangulation net.

At some of the stations at which observations are made for true azimuth, latitude observations are also made. This is done with little added cost, and the longitude and latitude data furnish very valuable information for use in determining the shape and size of the earth.

A party was in continuous operation in eight States and the island of Cuba, to furnish the values of gravity or the pull of the earth at scientific laboratories and at stations, furnishing valuable data regarding buried geological structure. The work in Cuba was done in cooperation with the American Geophysical Union and the Atlantic Refining Co., of Cuba.

The variation of latitude stations at Ukiah, Calif., and Gaithersburg, Md., were in continuous operation. These are two of a group of stations established around the world on the parallel latitude 39°08′, operated with a view to keeping a record of the changes in latitude. The results are essential to astronomical computations and investigations at most of the astronomical observatories of the world. The observations at Ukiah have been continuous since 1900, while

those at Gaithersburg have been carried on since 1900, except for the period between 1915–32.

The following table shows the work done by the Division of Geodesy during the year ended June 30, 1935:

Geodetic triangulation, base lines, reconnaissance, leveling, and astronomical and gravity observations

Locality	Length of scheme	Area
TRIANGULATION, FIRST ORDER	*Miles*	*Sq. mi.*
Lakefield to Alexandria, Minn.	150	1,500
Aitkin to Roosevelt, Minn.	190	1,900
Havana to Belleville, Ill.	55	550
Topeka, Kans., to Blair, Nebr.	60	600
Potomac River, Md. and Va.	50	600
Chesapeake Bay, Md.	100	1,000
Johannesburg to Bridgeport, Calif (Owens Valley)	80	1,500
Hanna, Wyo., to Opheim, Mont.	185	3,145
Hermann, Mo., to Wykoff Minn.	360	3,860
Alma to Marinette, Wis.	220	2,640
Hayward, Wis., to Princeton, Minn.	115	1,380
St. Paul, Minn., to Ladysmith, Wis.	125	1,250
Wellington to Sweetwater, Tex.	160	1,600
Sweetwater to Brackettville, Tex.	210	2,100
Blair, Nebr., to Adrian, Minn.	140	1,540
White Water to Hardin, Mont.	260	3,900
Austin, Nev., to Caldwell, Idaho	300	7,000
Crisfield to Elkton, Md.	190	1,520
Helena to Missoula, Mont.	145	2,900
Minot, N. Dak., to Presho, S. Dak.	300	3,600
Cottonwood, S. Dak., to Scottsbluff, Nebr.	150	1,500
Picacho, N. Mex., to Slaton, Tex.	140	1,400
Sarles, N. Dak., to Chamberlain, S. Dak.	355	3,550
Salina, Utah, to Grand Canyon, Ariz.	240	6,000
Columbia River, Wash. and Oreg.	90	1,350
White Sulphur Springs, Mont., to Belfield, N. Dak.	330	4,400
Hopkinsville, Ky., to Washington, Ind.	135	1,800
New Freedom to Scranton, Pa. (Susquehanna River)	180	2,450
McClenney, Fla., to Columbus, Ga., and Satilla River spur	280	2,700
Boulder Dam, Nev., to Grand Canyon, Ariz. (Colorado River)	180	5,400
Ada, Okla., to Abilene, Kans.	290	3,200
Hartford, Ark., to Pittsburg, Kans.	170	2,550
Abilene, Kans., to Columbus, Nebr.	160	1,600
Havana, Ill., to White Creek, Wis.	225	2,315
Columbus, Nebr., to Sioux Falls, S. Dak.	155	1,500
Hawthorn to Sulphur, Nev.	190	3,230
King Hill to Kimama, Idaho	70	1,750
Martinsburg, W. Va., to Newville, Pa.	85	850
Danville, to Brooksville, Ky.	85	900
Franklin to Parks, Nebr.	150	1,500
Towanda, Pa., to Syracuse, N. Y.	85	850
Fairmont to Reeder, N. Dak.	290	4,350
McCracken, Kans., to Cordell, Okla.	270	2,700
Hobart, Okla., to Cisco, Tex.	130	1,600
Cisco to Hondo, Tex.	200	2,000
Scottsbluff, Nebr., to Hugo, Colo.	200	2,000
Sharon Springs, Kans., to Texhoma, Tex.	160	1,600
Felt, Okla., to Fort Stockton, Tex.	390	3,900
Hondo to Mission, Tex.	210	2,100
Sherburn, Minn., to Kansas City, Mo.	315	3,150
Harrisonville, Mo., to Pittsburg, Kans.	85	850
McAlester, Okla., to Palestine, Tex.	210	2,100
Palestine to Bay City, Tex.	190	1,900
Moscow, Tenn., to Slidell, La.	335	3,350
Gulfport to Corinth, Miss.	270	3,240
Yuma to Stewart Dam, Ariz.	185	2,220
Phoenix to Winkelman, Ariz.	95	1,110
Florence to Tucson, Ariz.	90	1,000
Tucson to Nogales to Ajo, Ariz.	150	1,850
Lake City to Lake Stearns, Fla.	240	2,400
Sarasota to Stuart, Fla.	130	1,300
Miami to Key West, Fla.	135	1,080
Appling, Ga., to Live Oak, Fla.	250	2,500
Osgood to Canton, Mo.	80	800
Vicinity of Washington, District of Columbia, Maryland, and Virginia	15	120
Catesby, Okla., to Anthony, Kans.	120	1,200
Chamberlain, S. Dak., to Broken Bow, Nebr.	170	1,700
El Centro to San Diego, Calif.	60	600
Broken Bow, Nebr., to Wakeeney, Kans.	160	1,600
Jacksboro to Texarkana, Tex.	240	2,500
Boulder Dam, Nev., to Yuma, Ariz. (Colorado River)	220	2,640
Riceboro to Atlanta, Ga.	220	2,200
Alice to Encinal, Tex.	100	900
Lampasas to Leon Powell, Tex.	190	1,900
Lubbock to Seymour, Tex.	135	1,350
Newport to Freehold, N. J.	90	1,260
Woodville, Tex., to Redell, La.	95	900
Jacksboro, Tenn., to Albany, Ky.	65	780
Franklinville, N. Y., to Newcastle, Pa.	150	1,650
Greentree, Tenn., to Rowland, Ky.	125	1,500
Navasota to Woodville, Tex.	95	950
Boulder Dam, Nev and Ariz.	13	150
Austin to Navasota, Tex.	100	1,300
Total	14,113	168,580
TRIANGULATION, SECOND ORDER		
Lucerne Valley to Needles, Calif.	130	1,500
Rice to Kingston, Calif.	100	1,000
Saulsbury, Tenn., to Princeton, Ky.	130	1,350
Paducah, Ky., to Martin, Tenn.	50	450
Sparta, Tenn., to Gadsden, Ala.	130	1,300

Geodetic triangulation, base lines, reconnaissance, leveling, and astronomical and gravity observations—Continued

Locality	Length of scheme	Area
TRIANGULATION, SECOND ORDER—continued		
	Miles	*Sq. mi.*
La Fayette, Ga., to Union City, Tenn.	240	2,400
Greenville, Fla., to Hartwell, Ga.	260	2,600
Delaware River, New Jersey and Delaware boundary	10	30
Superior National Forest, Minn.	100	2,000
Chancellor, Tex., to Clayton, N. Mex.	360	3,600
Silver City, Ga., to Hardeeville, S. C.	200	2,000
Huntington, W. Va., to Pennington Gap, Va.	140	1,960
Beattyville, Ky., to Roanoke, Va.	200	2,700
Reidsville to Rentz, Ga.	50	500
Reddell to Napoleonville, La.	140	1,260
Chappells to Charleston, S. C.	150	1,200
Lowndesville, S. C., to Gastonia, N. C.	110	1,100
Americus, Ga., to Monticello, Fla.	110	1,100
Sahuarita, Ariz., to Pratt, N. Mex.	105	1,050
Osceola to Bucksport, S. C.	130	1,170
Texhoma to Thurston, Tex.	400	4,000
Allendale, S. C., to Odum, Ga.	90	900
Total	3,335	34,970
TRAVERSE, FIRST ORDER		
Miami to Estero, Fla.	76 8	
BASE LINES, FIRST ORDER		
Edina, Mo.	5.5	
Chandlerville, Ill.	6.0	
Antigo, Wis.	6 5	
Hayward, Wis.	4.8	
Shooks, Minn.	5.2	
Aberdeen, S. Dak.	7.5	
Pingree, N. Dak.	8.9	
Huff, N. Dak.	5.5	
Lenapah, Okla.	5.8	
Avard, Okla.	4.2	
Arabella, N. Mex.	6.0	
Presidio, Tex.	4.2	
Alexandria, La.	5.3	
Lonoke, Ark.	9.3	
Columbia, S. C.	4.2	
Perky, Fla.	4.5	
Berwick, Pa.	6.8	
Petty, Tex.	5.6	
Asbury, Mo.	4.9	
Newkirk, Okla.	7.5	
Huff, N. Dak. (remeasurement)	5.5	
Angela, Mont.	5.4	
Total	129.1	
RECONNAISSANCE, FIRST ORDER TRIANGULATION		
Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, Wyoming	18,075	203,315
RECONNAISSANCE, SECOND ORDER TRIANGULATION		
Alabama, Arizona, Arkansas, California, Delaware, Florida, Georgia, Louisiana, Michigan, Minnesota, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Wyoming	5,640	60,280

Locality	First order	Second order
LEVELING	*Miles*	*Miles*
Alabama	177	2,449
Arizona	573	2,526
Arkansas	197	4,440
California	1,226	4,540
Colorado	300	3,136
Connecticut	29	380
Delaware	29	48
Florida	226	711
Georgia	226	2,740
Idaho	290	1,455
Illinois	66	3,201
Indiana	61	1,995
Iowa	252	3,449
Kansas	142	4,977
Kentucky	196	2,075
Louisiana	88	1,647
Maine		546
Maryland	94	342
Massachusetts		124
Michigan	593	3,283
Minnesota	62	3,368
Mississippi	292	2,779
Missouri	242	3,449
Montana	176	5,057
Nebraska	65	3,974
Nevada	874	2,158
New Hampshire		330
New Jersey		285
New Mexico	240	4,072
New York	308	2,121
North Carolina	29	1,873
North Dakota	283	3,915
Ohio	538	2,545
Oklahoma	6	2,671
Oregon	31	1,988
Pennsylvania	153	3,416
South Carolina		894
South Dakota	506	3,575
Tennessee	297	1,956
Texas	356	7,587
Utah	593	2,207
Vermont		642
Virginia	85	1,930
Washington	4	1,468
West Virginia	78	347
Wisconsin	237	3,012
Wyoming	493	2,297
Total	10,713	113,980

Geodetic triangulation, base lines, reconnaissance, leveling, and astronomical and gravity observations—Continued

Locality	Number of determinations			
	Astronomical			Gravity
	Latitude	Longitude	Azimuth	
ASTRONOMICAL AND GRAVITY DETERMINATIONS				
Arkansas	1	1	1	
Connecticut				20
Cuba				84
Florida	14	14	14	
Georgia	7	7	7	
Illinois	2	2	2	1
Indiana	2	2	2	
Iowa	3	3	3	
Kentucky	1	2	2	
Louisiana		1	1	
Maryland		1	1	1
Massachusetts				11
Minnesota	1	1	1	
Mississippi	5	5	5	
Missouri	1	1	1	
Montana				29
Nebraska	1	1	1	
New Hampshire				1
New York		1	1	
Ohio	1	1	1	
Oklahoma	2	2	2	
Oregon	1	1		
Pennsylvania	1	2	2	20
South Carolina	6	6	6	
Tennessee	2	2	2	
Virginia	2	2	2	
Washington	1	1	1	
Wisconsin		4	4	
Wyoming				3
Total	54	63	62	170

Activity	Stations	Miles
SUMMARY		
Triangulation:		
First-order		14,113
Second-order		3,335
Traverse, first-order		76.8
Base lines, first-order		129.1
Reconnaissance:		
First-order triangulation		18,075
Second-order triangulation		5,640
Leveling:		
First-order		10,713
Second-order		113,980
Astronomical determinations:		
Latitude	54	
Longitude	63	
Azimuth	62	
Gravity determinations	170	
Total	349	166,061.9

The office computations and adjustments of 22 arcs of first-order and 51 arcs of second- and third-order triangulation were completed during the year, with computations of 20 arcs of first-order and 25 arcs of second- and third-order triangulation in progress. Computations were made of 15 first-order and 2 second-order bases. A field party in New York City was also engaged on triangulation, leveling, and plane coordinate computations.

About 300 separate lines of levels were adjusted to the level net during the year and information concerning descriptions and elevations of bench marks for 445 lines of levels were distributed to engineers and surveyors.

The personnel detailed to the Washington office by the Chief of Engineers, United States Army, prepared the manuscript for the publication containing the results of the triangulation along the Mississippi River between Memphis, Tenn., and Vicksburg, Miss. Results of the triangulation between Cairo, Ill., and Memphis, Tenn., were issued during the year.

The manual of plane coordinate computations was received from the printer during the year, together with publications covering triangulation in Missouri, Texas, and Oklahoma; triangulation and traverse in Louisiana and Arkansas; and leveling in Massachusetts, Rhode Island, Connecticut, New Hampshire, Vermont, Maine, Florida, and Arkansas. Others are in press or about to be sent to the printer.

TIDES AND CURRENTS

The Division of Tides and Currents is the clearing house of all tidal observations conducted by the Bureau. It is here that the observations made in connection with hydrographic work are tabulated and reduced. The expanded hydrographic work program has resulted in a large increase in office work, as observations from 965 stations were received for reduction and the determination of datum planes.

Thirty-four primary tide stations were operated during the year: 21 on the Atlantic coast, 3 on the Gulf coast, 7 on the Pacific coast, 2 in Alaska, and 1 in the Hawaiian Islands. Fourteen of these were conducted on a cooperative basis with Army Engineers at Wilmington and Southport, N. C., Miami Beach and Mayport, Fla., and Mobile, Ala.; Navy Department at Newport, R. I., Annapolis, Md., Portsmouth, N. H., Portsmouth and Hampton Roads, Va., and San Diego, Calif.; Woods Hole Oceanographic Institute, Woods Hole, Mass.; Harbor Department, Los Angeles, Calif.; and the Surveyor of the Territory of Hawaii, Honolulu.

The data obtained at these stations were supplemented by observations at 433 secondary stations, 69 of which were maintained throughout the year and the others for periods of 1 month or longer. These included cooperative stations with the Army Engineers, Fort Worden, Wash.; University of Washington, Friday Harbor, Wash.; Biological Research Bureau, Bermuda; Washington Suburban Sanitary District, Bladensburg, Md.; California State authorities, Santa Monica, Calif.; Portland Canal Power Co., Hyde, Alaska.; and the port of Willipa Bay, Raymond, Wash.

In the interests of navigation and engineering, special tide and current surveys are conducted at various coastal sections where precise tidal information is lacking. The comprehensive tide survey is a relatively new development made necessary by modern conditions which have enormously increased land values along tidal waters. During the year, such a survey was in progress for the Washington coast. The special current surveys are made of important harbors and waterways to make available the characteristics of the current movement essential to navigation and harbor engineering. The Bureau is the recognized authority in this line of work and numerous requests for such surveys are continually being received. During the year, the waterways of Nantucket and Vineyard Sounds and the harbors of San Diego, Galveston, and Mobile, were covered by current surveys. This Bureau, in cooperation with the Lighthouse Service, also began a comprehensive series of current observations in San Pedro Channel.

In addition to their utilization in the construction of charts, the tide and current data obtained by the Survey are made available to the public in tide and current tables, and miscellaneous publications.

Tide tables are issued annually to meet the demand for advance information as to the times and heights of high and low waters, required by modern commerce with its deep-draft vessels moving on exacting schedules. For convenience to the public, the tide tables are published in two volumes, one for the Atlantic Ocean and another for the Pacific and Indian Oceans. Together, they give daily predictions of the high and low waters for 96 of the more important ports of the world, together with data for obtaining predictions at some 3,900 other places. Through cooperative arrangements, international exchanges of predictions for the annual tide tables are made with England, 21 stations; Germany, 6 stations; France, 4 stations; Canada, 5 stations; and India, 5 stations.

Current tables are also issued annually to give the mariner information relative to the currents which affect the speed and course of his ship. The Current Tables, Atlantic Coast, have been enlarged to include daily predictions for 3 new stations (Baltimore Harbor approach, St. Johns River entrance, and Miami Harbor entrance), making a total of 16 stations for which daily predictions are now given. Through the use of differences given in the tables, daily predictions are also obtained for some 850 other stations. The Current Tables, Pacific Coast, give daily predictions for 10 of the more important waterways on our Pacific coast and for 1 in the Philippine Islands, together with data for obtaining predictions at some 500 other stations.

The results of current surveys were also utilized in the preparation of a new set of tidal current charts for Long Island and Block Island Sounds, and a revised edition for New York Harbor.

To supply the engineer with the elevations of the tidal datum planes along our coast, copies of the descriptions and elevations of the tidal bench marks are prepared for each of our coastal States. During the year, such information was made available for the State of Oregon.

TERRESTRIAL MAGNETISM

The Division of Terrestrial Magnetism and Seismology conducts the magnetic survey of the United States, the results of which are available primarily for the use of the sea and air navigator, and secondarily for the land surveyor and investigator of radio and other problems.

Continuous photographic records of the changes in the earth's magnetism were made at the magnetic observatories near San Juan, P. R. (1926); at Cheltenham, Md. (1901); near Tucson, Ariz. (1909); near Honolulu, Hawaii (1902); and Sitka, Alaska (1902). (The dates in parentheses indicate the year in which the operation of the observatory began.) In this period of more than three decades a notable contribution to the study of the earth's magnetism has been made. With recent repairs and additions to buildings and instruments, the observatories are now well equipped for still more valuable additions to our sum of knowledge of the subject.

Field work was devoted primarily to observations at "repeat" stations to determine the change in the earth's magnetism during the interval of about 5 years. This year's results complete the data needed for bringing up to 1935 the results of observations at over 6,000 stations all over the country, and the preparation of magnetic maps for that year. Further progress was made in establishing new repeat stations at triangulation stations situated in the open country, which should be more likely to continue available for future use than those near cities and towns.

To provide reference points for local surveyors, magnetic stations were established at numerous county seats where observations had not been made previously and at other places where old stations had ceased to be available, especially in Georgia and South Carolina. Continued cooperation with State civil works administrations has secured results of mutual benefit and demonstrated more fully to local authorities how Federal surveys may be useful to them.

On the initiative of a New Jersey civil works representative, a plan was formed for cooperation with airport authorities to provide compass-testing stations at airports. In spite of such remarkable devices as the radiocompass and directional gyro, these aids to navigation still have to refer to the magnetic compass for their basic control. The directional gyro has to be reset every 20 minutes by the magnetic compass and the radiocompass is no more complete in itself on board an airplane than it is on board a ship. To obtain a bearing it must be referred to the magnetic compass. In addition, the radio becomes useless in times of heavy thunderstorms, since then the antenna is grounded to prevent damage to the plane by lightning. With this in mind and as rapidly as available funds permit, astronomical and magnetic observations are being made at the principal airports. These enable the aviator or airport engineer to test the airplane compass at frequent intervals and thus insure greater accuracy in navigating the plane by compass, furnish proper corrections to the compass courses, and thus promote safer navigation.

The channel ranges in navigable rivers offer a convenient means for navigators of sea-going vessels to test their compasses when following the channels. Such observations have advantages over those made by astronomic methods. Magnetic observations were made at many places along the river approaches to Jacksonville, Fla., Charleston and Georgetown, S. C., and Wilmington, N. C., and the magnetic bearings of the ranges were determined. Magnetic observations were also included in the general survey of the Aleutian Islands in progress during the year.

The distribution of the magnetic observations made during the year is shown in the following table:

State	Complete observations at repeat stations		Observations at other stations		Total	State	Complete observations at repeat stations		Observations at other stations		Total
	Old	New	Complete	Declination			Old	New	Complete	Declination	
Alaska	2			34	36	Nevada	5	2		1	8
Arizona	1			1	2	New Mexico				1	1
California	2		1	16	19	New York	1	1			2
Colorado	1			3	4	North Carolina	7	2		22	31
Florida				37	37	North Dakota	4		7		11
Georgia	4		4	10	18	Ohio	2	2			4
Hawaii	1				1	Pennsylvania	3	2	1	4	10
Idaho	1		1	3	5	Puerto Rico	1				1
Illinois			1	1	2	South Carolina	1			47	48
Indiana	2				2	South Dakota	3				3
Kansas	3		2		5	Utah	2			1	3
Kentucky	2	1	1		4	Virginia		1		1	2
Maryland	2	1	1	3	7	West Virginia	1				1
Massachusetts				6	6	Wyoming	2			4	6
Michigan	3	1			4						
Minnesota	3				3	Total	65	13	19	201	298
Montana	6			6	12						

Cheltenham has been designated as the observatory in this country for international comparisons of magnetic instruments. It is also the base station for standardization of instruments of this Bureau. With the cooperation of the department of terrestrial magnetism of the Carnegie Institution of Washington, the sine-galvanometer of that institution was installed at Cheltenham as the standard horizontal intensity instrument for all comparisons. In cooperation with the cosmic ray committee of the Carnegie Institution of Washington, a cosmic ray apparatus installed at Cheltenham is being operated by the observatory personnel. Information regarding the magnetic character of days is now supplied by the Cheltenham observatory for the daily broadcast of cosmic data sent out by science service under the auspices of the International Scientific Radio Union.

At the Tucson observatory the recording of variations of atmospheric electricity and of earth currents was continued throughout the year, through the cooperation of the Carnegie Institution of Washington and the Mountain States Telegraph & Telephone Co.

The demand for information derived from the magnetic observations of the Bureau is growing. The results are made available to the public in various forms of publication, on nautical and aeronautical charts, and by correspondence. Land surveyors are writing constantly for assistance in retracing the lines of old compass surveys. For the southeastern quarter of the country and for California and Nevada, the information is available in the form of publications of magnetic declination by States or State groups. A number of these were prepared, issued, or revised during the year, although most of them are in mimeographed form, because of frequent changes in available data.

The observatory results are used extensively by those engaged in the study of radio transmission. Knowledge of the changes in the earth's magnetic field from hour to hour is an important factor in the use of magnetic methods in prospecting for oil, magnetic iron ore, and other minerals.

Information is made available at nominal cost as rapidly as possible, and the observatory results are issued in final form, each volume covering 2 years for an observatory. At the close of the year the 1927–28 series had been issued, the 1929–30 series was ready to put in final form, and a good start was made on the 1931–32 series. Preparation for publication of data obtained during the polar year was well advanced.

SEISMOLOGY

The work in seismology is that part of a broad cooperative study, without regard to locality, which can be carried through only by a Government agency.

Earthquakes can be neither prevented nor controlled, and there are only two ways in which they can be dealt with for the benefit of man. One is to predict so as to be ready for them, and the other is to find out how the damage caused by them to life and property may be kept to a minimum.

Little progress has been made in prediction, but the Bureau is making several contributions which, in addition to other present value, may eventually be useful for that purpose. One is the collection of earthquake statistics, including complete descriptions, and the other is the measurement of earth tilt at a station at the University of California, operated in cooperation with that institution. Japanese experience indicates a relation to earthquake prediction. Closely related to prediction is the special geodetic work in earthquake regions, which permits measurement of changes in the earth's crust.

The collection and publication of earthquake information is made possible through cooperation. The part taken by the Bureau is the operation of 8 seismograph stations either directly or cooperatively, the interpretation of the records of 6 others, and the assembling and publication of reports of visible and felt effects of earthquakes. The stations at San Juan, P. R., Tucson, Ariz., Sitka, Alaska, and Ukiah, Calif., are operated by the Bureau; those at Columbia, S. C., Chicago, Ill., Bozeman, Mont., Honolulu, Hawaii, are cooperative. Plans were completed for another cooperative station at College, near Fairbanks, Alaska, which will be in operation early in the next fiscal year. Immediate location of 23 earthquake epicenters was made possible through the cooperation of many stations, Science Service, and the Jesuit Seismological Association. Complete earthquake information is published annually.

Better results, though still far from perfect, are obtained in the field of prevention of damage, the only great difficulty being that it is necessary to have an earthquake in order to appraise the effectiveness of the preventive measures.

The work of the Bureau in this particular field has been done principally in California, not because there is not need elsewhere, but because it affords a convenient laboratory for the work, there is a better chance of immediate economic use, there are other related activities going on there which fit particularly well into the program, and, finally, because the Government has an active interest, owing to the large sums of Federal funds advanced for various projects such as the great dams, including Boulder Dam, bridges, and buildings.

The work has for its purpose the measurement of strong earth motions, and includes the measurement of acceleration, ground displacement, periods and duration of the shocks, these being the factors which account for destructiveness. Observations were made on the ground and in various places above the ground in various structures. It was found that much useful information in this connection can be obtained without waiting for an earthquake, and instruments developed in this Bureau have made it possible to determine the periods of buildings, elevated tanks, bridge piers, dams, and of the ground itself. In addition, with the cooperation of Stanford University, a building vibrator was developed by which the period and amount of energy of the shaking device can be controlled.

Fifty strong motion instruments were kept in operation in California, 1 in Panama, and 1 each were kept available in Chicago and Washington for use if there should be a large earthquake in middle west or east. These reserve instruments were loaned for short periods for determination of velocity of seismic waves resulting from large explosions, the Bureau benefiting by the results.

Twenty-five strong motion records were obtained from 9 earthquakes, 8 in California and Nevada and 1 in Panama, which were analyzed in such a way as to obtain from them complete information.

Vibration observations were made in 212 buildings, on 37 elevated water tanks, 1 completed and 2 uncompleted bridges, 2 dams, 6 pavement sites, at 2 places to determine ground vibration periods, and on several structures of special design. The measured movements were in most cases normal structural vibrations, but a specially constructed vibrating machine was used in the work on 2 buildings, 2 dams, 1 bridge, and on 1 ground vibration test.

Special cooperative work included the test on a shaking platform at the National Bureau of Standards of a number of types of high magnification seismographs, thereby obtaining hitherto unavailable information. Cooperation and advice have helped to make possible active seismological stations at Pennsylvania State College and the University of Utah.

Most of the information collected each year appears in an annual publication on earthquakes. In view of the large amount of special work done in strong motion and related work, a special publication giving results in this field was prepared during the year. Quarterly instrumental reports are issued as are also preliminary reports on California earthquakes and preliminary interpretation of strong motion records.

BUREAU OF NAVIGATION AND STEAMBOAT INSPECTION

The following tables and information show statistics and items of particular and general interest as regards the work of the Bureau of Navigation and Steamboat Inspection for the 12 months ended June 30, 1935.

Some remarks of a special nature in connection with the technical work of the Bureau are also included, under the section on Safety of Life at Sea.

AMERICAN SHIPPING ON JUNE 30, 1935

On June 30, 1935, the merchant marine of the United States, including all kinds of documented craft, comprised 24,919 vessels of 14,653,756 gross tons, as compared with 24,904 vessels of 14,861,834 gross tons on June 30, 1934. On June 30, 1935, of this total, there were 3,873 vessels of 4,569,124 gross tons engaged in the foreign trade, as compared with 3,842 vessels of 4,606,623 gross tons on June 30, 1934. Following is an analysis of the ownership of documented tonnage compared with a year ago:

Ownership and date	Steel		Wood		Total	
	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage
Private ownership (5 net tons and over):						
July 1, 1934	4,785	11,477,453	19,921	2,260,587	24,706	13,738,040
July 1, 1935	4,816	11,364,746	19,878	2,184,802	24,724	13,549,548
U. S. Shipping Board Bureau:						
July 1, 1934	198	1,123,794			198	1,123,794
July 1, 1935	195	1,104,208			195	1,104,208
Total, 1934	4,983	12,601,247	19,921	2,260,587	24,904	14,861,834
Total, 1935	5,011	12,468,954	19,878	2,184,802	24,919	14,653,756

Of these totals, 3,873 vessels of 4,569,124 gross tons were engaged in the foreign trade and 21,046 vessels of 10,084,632 gross tons in the coasting trade.

Since June 1, 1921, when our tonnage in the foreign trade reached its greatest volume, 11,077,398 gross tons, there has been a gradual decline, until June 30, 1935, it amounted to only 4,569,124 gross tons, a falling off of 6,508,274 gross tons. The decrease in the foreign trade tonnage is due principally to the scrapping of large vessels which belonged to the Shipping Board and to changes from foreign to coasting trade because of greater opportunities in that service.

Since June 1, 1921, the coasting trade tonnage, exclusive of the trade on the Great Lakes, has increased 3,732,160 gross tons.

During the year, 748 vessels of 62,919 gross tons were built and documented, and on July 1, 1935, there were building or under contract to build in our shipyards for private shipowners 49 vessels of 20,292 gross tons. The corresponding figures for 1934 were 724 vessels of 66,649 gross tons built and 53 vessels of 38,102 gross tons under contract to build.

Only 1 steel steam vessel of over 1,000 gross tons was built during the fiscal year 1935, this vessel being a tanker of 9,511 gross tons and licensed for the coasting trade.

LAID-UP VESSELS

On June 30, 1935, the laid-up tonnage of the United States aggregated 2,291 vessels of 2,794,098 gross tons, as against 2,551 vessels of 3,125,138 gross tons on June 30, 1934.

Details of the world's laid-up tonnage, classification of American vessels by size, service, and power, and of vessels launched and under construction may be found in Merchant Marine Statistics for 1935, a publication prepared by this office.

SAFETY OF LIFE AT SEA

The disasters to the steamships, *Morro Castle*, *Mohawk*, and *Havana* were intensively studied by the Bureau to determine the fundamentals lying behind these disasters.

It has been determined that the prevention of the recurrence of similar disasters will depend largely upon the extent to which the Bureau has jurisdiction and control over ship personnel, ship operation, and the design and construction of vessels. These are the three great fundamentals involved.

To accomplish this end, it is necessary that the scope of the authority of the Bureau be extended and that the Bureau receive sufficient funds to properly administer its present functions, which should be greatly augmented, as at the present time it is undermanned and its personnel underpaid.

Modifications to the existing rules and regulations of the Bureau have been made during the past fiscal year and these modifications are embodied in Supplements Nos. 51 and 52. These rules and regulations go as far as possible toward increased safety within the limits of the present law.

The Bureau has prepared for the Congress certain recommendations in regard to new legislation and has rendered every assistance to the congressional committees in their study of the subject.

Unfortunately the entire legislative program was not completed before the adjournment of Congress, but four acts strengthening the position of the Bureau were adopted:

(*A*) An act extending the load line to coastwise and Great Lakes vessels.

(*B*) An act controlling direct steering orders.

(*C*) An act placing under the jurisdiction of the Bureau certain vessels carrying dangerous cargoes.

(*D*) An act limiting the liability of shipowners.

The remainder of the program failed to pass on account of lack of time, but there is every indication that at the next session of Congress the entire project will be completed. When this is done, the Bureau will be in a position to efficiently control the three great fundamentals above mentioned. Provision is made for the reorganization of the Bureau, increasing its personnel, establishing a Technical Division in the Bureau and appointing proper trial boards to investigate accidents and disasters. Provision is also made for certain adjustments in working conditions of the Bureau's personnel that will tend toward efficiency of inspection and more just and equitable treatment of its employees.

During the year the routine inspections have been greatly improved and a system of thorough periodical surveys has been instituted which greatly adds to the assurance of proper maintenance of vessels. Studies have been completed in regard to fire retarding and fire resisting construction, compartmentation, and stability in damaged condition. Of course, none of the foregoing has proceeded with desirable speed owing to lack of personnel and funds.

Every effort has been made to adapt the activities of the Bureau to the requirements of the industry. While one of the best examples of this has occurred after the end of the fiscal year, it should be known that certain information in connection with the stranding of the steamship *Dixie* has been furnished to the owner. This information was not available elsewhere on short notice, and we are informed that the same proved a valuable assistance in salvage operations.

The work of the Bureau's patrol fleet is being extended rapidly, inspections greatly increased, and at the same time a friendly cooperation with the small motor-boat operator is rapidly being built up, all to the end that the operators of that class of boat may be educated in safety matters. This will tend to reduce the large number of annual accidents and explosions which occur on such craft.

TECHNICAL DIVISION

The Technical Division was engaged in conducting studies of presently operated passenger vessels with a view to increasing safety of life at sea.

Thus far, a number of technical reports have been completed covering subdivision and stability in intact and damaged conditions. Recommendations have been made to the operators in confidential reports indicating the structural and ballasting changes considered necessary to bring American ocean and coastwise vessels to desirable safety standards.

SHIPPING COMMISSIONERS

During the year 554,884 seamen were shipped, reshipped, and discharged before our shipping commissioners, as compared with 508,898 the year before. The average cost to the Government per man was 23 cents, an increase of 1 cent per man over like costs last year.

Collectors of customs acting at ports where shipping commissioner offices have not been established, shipped, and discharged during the

year 25,595 officers and men, as compared with 27,084 the previous year.

Of the 253,133 men shipped before shipping commissioners, 155,712 were native Americans, and 48,511 were naturalized Americans; 204,223 in all, or 80.6 percent.

In addition to these numbers there were shipped in foreign ports in the foreign trade for the round voyage, many seamen who do not appear before our shipping commissioners. These numbers are not included in the above figures.

The following table shows the aggregate work and salaries of the shipping service for the past 16 years:

Year	Seamen shipped, re-shipped, and discharged	Salaries	Average cost per man	Year	Seamen shipped, re-shipped, and discharged	Salaries	Average cost per man
1920	628,980	$89,949	$0.13	1928	547,732	$123,961	$0.23
1921	650,840	99,646	.15	1929	627,392	139,454	.22
1922	541,952	92,318	.17	1930	650,673	147,873	.23
1923	538,755	94,476	.17	1931	589,901	152,003	.26
1924	555,633	94,476	.17	1932	515,051	158,616	.31
1925	552,124	123,726	.22	1933	476,615	124,305	.26
1926	534,493	123,183	.23	1934	508,898	114,442	.22
1927	561,061	122,398	.22	1935	554,884	128,715	.23

The shipping commissioner service furnishes the medium through which voluminous laws for the protection, welfare, and discipline of American seamen are effectuated. In order that no advantage may be taken of the seaman and also that he may understand his responsibilities, his contract of employment is supervised by our shipping commissioners and where there are any unusual provisions because of the nature of the voyage or of the cargo carried, those provisions are explained to him in detail.

Any disputes which may arise during the voyage may be arbitrated before the shipping commissioner without cost to the seaman and without delay. Under the law the shipping commissioner's decision is final as to the facts.

For the benefit of dependents the shipping commissioner issues allotment notes payable to such dependents from the seaman's wages as earned. In case of death of the seaman his wages and effects are taken care of by the shipping commissioner.

This is a beneficent service, as it insures to the seamen the benefits of the laws which Congress has passed in their behalf.

ADMEASUREMENT OF VESSELS

Collectors' reports indicate that 1,100 vessels, aggregating 105,700.54 gross tons, were admeasured during the year, of which about 60, of approximately 27,000 gross tons, were reviewed. A tanker of 9,512 gross tons built in Philadelphia was among these, the others being small vesels.

As in the previous year, there was a falling off in number and tonnage of merchant vessels, but an increase in Government vessels such as Coast Guard cutters, lighthouse tenders, naval vessels, etc.

Readmeasured under the provisions of article 45 were 433 vessels, the tonnage of which was changed from 763,470 tons gross and 472,772 tons net to 759,618 tons gross and 471,667 tons net.

LOAD LINE

The total number of inspections of vessels at time of clearance was 14,118, of which 8,840 were foreign and 5,278 domestic. The number of violations discovered was 20.

During the year 50 load-line certificates on the international form were issued and 37 on form B. The total number of vessels to which load-line certificates were issued is 1,285. Annual inspections numbered 920.

PASSENGER ACT OF 1882

This enforcement of this law through the marine divisions of the customhouses has affected 929 voyages involving 146,331 steerage passengers. The purpose of the act is to provide for the welfare, health conditions, food, separation of the sexes, and care in case of sickness.

NAVIGATION RECEIPTS

During the year the Bureau has collected through tonnage duties, navigation fees, and navigation fines $1,668,509.32, a sum considerably in excess of the cost of administration of the Bureau. The table below shows these collections in detail:

June 30—	Tonnage duties	Navigation fees	Navigation fines	Total
1935	$1,452,257.50	$179,444.83	$36,806.99	$1,668,509.32
1934	1,483,161.11	172,093.30	30,895.04	1,686,149.45
1917	1,393,743.16	159,808.03	49,962.37	1,603,513.56

ADMINISTRATION

The general work of the superintendence of the commercial marine and merchant seamen vested in this Bureau by its organic act has proceeded along regularly established lines. The interpretation and administration of the navigation and steamboat inspection laws, covering documentation, inspection of hulls, boilers, and equipment, examination and licensing of officers, certification of able seamen and lifeboat men, Ship Mortgage Act, entry and clearance of vessels, movement of vessels, welfare of seamen, admeasurement, load line, adjudication of penalties, collection of fees, tonnage tax, etc., and the compilation of Federal statistics of the merchant marine, have been carried on.

In the enforcement of the rules and regulations governing the movement of vessels in the St. Mary's River, patrol of the course during regattas and marine parades, the Bureau is indebted to the Coast Guard which operated in its usual efficient manner under the rules and regulations of the Department.

During the year 7,493 violations of the navigation laws were considered in connection with the mitigation or remission of the penalties incurred. The following table shows the enforcement of such laws by customs districts and the laws violated:

Headquarters port	Total	Steamboat laws	Motorboat laws	Surrendered license	Seamen's act	Anchorage and St. Marys River rules	Passenger act	Enrollment and license	Entry and clearance	Name on vessel	Change of master	Unlading	Load line act	Numbering act	Miscellaneous
Baltimore	263	7	209	15	----	----	----	3	----	3	1	1	1	16	7
Boston	130	17	38	36	----	----	----	10	5	1	4	3	1	12	3
Bridgeport	132	3	77	18	----	----	----	6	----	7	4	----	----	13	4
Buffalo	63	1	55	3	----	----	----	----	----	----	----	1	----	3	----
Charleston	84	2	53	17	----	----	----	4	----	2	4	----	----	2	----
Chicago	10	----	6	3	----	----	----	----	----	----	----	1	----	----	----
Cleveland	108	2	29	11	1	----	----	1	8	16	2	9	----	28	1
Detroit	382	----	250	37	----	18	----	1	10	----	1	1	----	61	3
Duluth	6	----	1	2	----	----	----	----	1	----	----	----	----	1	1
Galveston	117	2	73	11	----	----	----	1	1	6	1	----	----	20	2
Honolulu	96	10	38	4	1	----	----	1	----	----	1	1	----	28	12
Indianapolis	1	----	----	----	----	----	----	----	----	----	----	----	----	1	----
Juneau	40	1	8	15	----	----	----	4	----	5	----	1	----	5	1
Los Angeles	215	9	93	52	----	----	----	1	2	10	----	2	4	25	17
Louisville	17	3	11	1	----	----	----	----	----	----	----	----	----	2	----
Memphis	5	----	1	1	----	----	----	----	----	----	----	----	----	3	----
Milwaukee	3	----	2	1	----	----	----	----	----	----	----	----	----	----	----
Mobile	218	24	148	13	----	----	----	1	----	14	3	----	----	14	1
New Orleans	750	6	475	30	----	----	----	6	1	49	4	----	----	160	19
New York	1,721	56	1,195	144	1	----	----	10	2	96	16	2	1	153	45
Norfolk	401	34	257	28	15	----	----	1	----	5	6	3	----	24	28
Ogdensburg	9	2	4	1	----	----	----	----	1	----	----	1	----	----	----
Pembina	2	----	----	----	----	----	----	----	----	----	----	----	----	2	----
Philadelphia	134	8	16	49	2	----	----	3	4	----	2	2	1	45	2
Pittsburgh	6	----	1	4	----	----	----	----	----	----	1	----	----	----	----
Port Arthur	49	----	19	13	----	----	----	----	2	----	----	----	----	8	7
Portland, Maine	55	3	17	20	----	----	----	----	1	----	1	----	1	12	----
Portland, Oreg	83	1	42	18	1	----	----	----	2	----	----	----	----	17	2
Providence	13	----	9	----	----	----	----	----	2	----	----	----	----	2	----
Rochester	73	1	63	----	----	----	----	----	----	----	----	----	----	9	----
St. Albans	4	----	2	1	----	----	----	----	1	----	----	----	----	----	----
St. Louis	12	----	6	4	----	----	----	----	----	----	----	----	----	2	----
San Antonio	76	2	60	1	----	----	----	----	----	----	----	----	----	13	----
San Diego	33	1	11	2	----	----	----	1	----	1	----	----	----	17	----
San Francisco	305	7	146	51	20	----	2	6	4	16	4	3	6	24	16
San Juan	25	----	10	13	----	----	----	----	1	----	----	----	----	1	----
Savannah	192	1	162	4	----	----	----	----	1	9	2	----	----	11	2
Seattle	343	42	32	76	7	----	----	7	24	2	2	9	2	115	25
Tampa	1,274	6	892	73	----	----	----	12	8	38	10	4	5	210	16
Wilmington	43	2	13	24	1	----	----	----	----	----	----	----	----	3	----
Total	7,493	253	4,524	796	49	18	2	79	81	280	69	44	22	1,062	214

The following table shows the number of violations of law reported to the Department by the various branches of the Federal service engaged in the enforcement of the navigation laws:

Headquarters port	Total	Dryden	Eala	Kilkenny	Psyche	Siwash	Coast Guard	Local inspectors	Customs inspectors	Navigation inspectors
Baltimore	263	----	191	----	----	1	11	8	52	----
Boston	130	----	----	----	----	----	20	14	94	2
Bridgeport	132	----	----	----	----	82	14	3	33	----
Buffalo	63	----	----	----	47	----	----	1	15	----
Charleston	84	----	2	44	----	----	18	----	20	----
Chicago	10	----	----	----	----	----	6	----	4	----
Cleveland	108	----	----	----	30	----	----	3	75	----
Detroit	382	----	----	----	295	----	10	2	75	----
Duluth	6	----	----	----	----	----	3	----	3	----
Galveston	117	52	----	----	----	----	10	2	53	----

Headquarters port	Total	Dryden	Eala	Kilkenny	Psyche	Siwash	Coast Guard	Local inspectors	Customs inspectors	Navigation inspectors
Honolulu	96						53		43	
Indianapolis	1								1	
Juneau	40						13		27	
Los Angeles	215						6	8	107	94
Louisville	17						13	3	1	
Memphis	5							2	3	
Milwaukee	3							2	1	
Mobile	218	150					25	2	41	
New Orleans	750	608					16	13	113	
New York	1,721					1,441	19	12	249	
Norfolk	401		262				8	1	130	
Ogdensburg	9				2			3	4	
Pembina	2								2	
Philadelphia	134		5			2	9	4	114	
Pittsburgh	6							1	5	
Port Arthur	49	25							24	
Portland, Maine	55						16		38	1
Portland, Oreg	83						15	10	46	12
Providence	13						4			9
Rochester	73				70			1	2	
St. Albans	4								4	
St. Louis	12								12	
San Antonio	76						23	1	50	2
San Diego	33						15		18	
San Francisco	305						107		198	
San Juan	25						1		24	
Savannah	192			172			1		19	
Seattle	343						27	1	307	8
Tampa	1,274	13		782			76		403	
Wilmington	43		14					3	26	
Total	7,493	848	474	998	444	1,526	539	100	2,436	128

HULLS AND EQUIPMENT STATISTICS

MISCELLANEOUS INSPECTIONS

[Statement of steam vessels granted letters of approval of designs of boilers, engines, and other operating machinery inspected under an act of Congress approved June 9, 1910, which vessels are not inspected annually, only 1 inspection being made for letter of approval; hulls of United States Government vessels inspected; and boilers in or for United States Government steamers and buildings, and for other United States governmental purposes.]

Local inspection district (port)	Steam vessels granted letters of approval		Government vessels inspected	Government boilers inspected	Local inspection district (port)	Steam vessels granted letters of approval		Government vessels inspected	Government boilers inspected
	Number	Gross tonnage				Number	Gross tonnage		
San Francisco, Calif				71	Point Pleasant, W. Va			2	86
Honolulu, Hawaii			8	30	Detroit, Mich			1	12
Los Angeles, Calif				35	Chicago, Ill			1	34
Portland, Oreg				46	Duluth, Minn			2	3
New York, N. Y			4	109	Grand Haven, Mich	1	47	1	12
Albany, N. Y	1	21		25	Marquette, Mich			1	11
New Haven, Conn				4	Milwaukee, Wis			10	32
Philadelphia, Pa				57	Cleveland, Ohio	2	92	3	4
Norfolk, Va			4	79	Buffalo, N. Y	2	71	4	8
Baltimore, Md				119	Oswego, N. Y				18
Charleston, S. C			2	35	Toledo, Ohio				7
Jacksonville, Fla				16	New Orleans, La			44	215
Savannah, Ga				59	Galveston, Tex				108
St. Louis, Mo				233	Mobile, Ala			6	118
Dubuque, Iowa			1	121	San Juan, P. R				10
Boston, Mass			4	42	Tampa, Fla				17
New London, Conn				6	Seattle, Wash	1	70		30
Portland, Maine			2	13	Hoquiam, Wash				6
Louisville, Ky				39					
Evansville, Ind				32	Total, 1935	7	301	100	2,210
Memphis, Tenn				105	Total, 1934	6	6,123	89	2,208
Nashville, Tenn				38					
Pittsburgh, Pa				62	Increase (+) or decrease (−)	+1	−5,822	+11	+2
Cincinnati, Ohio				103					

REINSPECTIONS

Local inspection district (port)	Steam vessels	Motor vessels	Barges, etc.	Total	Local inspection district (port)	Steam vessels	Motor vessels	Barges, etc.	Total
San Francisco, Calif.	142	103	1	246	Detroit, Mich.	74	9		83
Honolulu, Hawaii	24	10		34	Chicago, Ill.	36	5		41
Los Angeles, Calif.	16	9		25	Duluth, Minn.	7			7
Portland, Oreg.	12	15		27	Grand Haven, Mich.	30	6		36
New York, N. Y.	861	190	2	1,053	Marquette, Mich.	26	11		37
Albany, N. Y.	34	28		62	Milwaukee, Wis.	19	7		26
New Haven, Conn.	12	57		69	Port Huron, Mich.	13	28		41
Philadelphia, Pa.	171	109		280	Cleveland, Ohio	12			12
Norfolk, Va.	70	13	3	86	Buffalo, N. Y.	56		3	59
Baltimore, Md.	65	12		77	Oswego, N. Y.	17	47		64
Charleston, S. C.		34		34	Toledo, Ohio	12	4		16
Jacksonville, Fla.	22	108		130	New Orleans, La.	112	53	17	182
Savannah, Ga.	18	9		27	Galveston, Tex.	3	12	3	18
St. Louis, Mo.	6			6	Mobile, Ala.	2			2
Dubuque, Iowa	2			2	San Juan, P. R.	2	1		3
Boston, Mass.	110	3		113	Tampa, Fla.	6	5		11
Bangor, Maine	6	4	4	14	Seattle, Wash.	40	29		69
New London, Conn.	8	25		33	Juneau, Alaska	3	7		10
Portland, Maine	46	3		49					
Providence, R. I.	43	6		49	Total, 1935	2,180	962	33	3,175
Louisville, Ky.	3			3	Total, 1934	3,241	1,001	33	4,275
Memphis, Tenn.	3			3					
Pittsburgh, Pa.	4			4	Decrease	1,061	39		1,100
Cincinnati, Ohio	23			23					
Point Pleasant, W. Va.	9			9					

VESSELS INSPECTED AND CERTIFICATES OF INSPECTION ISSUED TO STEAM AND MOTOR VESSELS AND TO BARGES

CERTIFICATES OF INSPECTION ISSUED BY DISTRICTS

Supervising district	Local district	Domestic vessels										Foreign passenger steam and motor vessels		Total	
		Steam vessels		Motor vessels		Passenger barges		Sea-going barges		Total					
		Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage
First	San Francisco, Calif.	263	941,104	114	58,967	1	103	4	7,475	382	1,007,649	30	224,215	412	1,231,864
	Honolulu, Hawaii	12	21,844	7	693					19	22,537	16	259,491	35	282,028
	Los Angeles, Calif.	71	321,753	29	22,910			1	434	101	345,097	8	60,555	109	405,652
	Portland, Oreg.	59	186,378	14	1,804	1	538	1	976	75	189,696	2	19,491	77	209,187
Second	New York, N. Y.	999	2,158,137	198	199,220	1	465	100	104,876	1,298	2,462,698	114	2,217,810	1,412	4,680,508
	Albany, N. Y.	68	34,497	22	10,099			2	1,659	92	46,255	1	94	93	46,349
	New Haven, Conn.	24	4,339	33	1,637			3	3,498	60	9,474			60	9,474
	Philadelphia, Pa.	204	490,360	82	160,541	1	799	43	39,302	330	691,002			330	691,002
Third	Norfolk, Va.	140	179,889	108	9,634	2	620	56	72,569	306	262,712			306	262,712
	Baltimore, Md.	225	687,574	105	31,192			10	9,026	340	727,792			340	727,792
	Charleston, S. C.	13	10,548	44	8,182			3	4,943	60	23,673			60	23,673
	Jacksonville, Fla.	29	71,824	79	7,081			1	521	109	79,426	1	3,445	110	82,871
	Savannah, Ga.	25	79,921	7	337					32	80,258			32	80,258
Fourth	St. Louis, Mo.	59	20,437	24	1,465					83	21,902			83	21,902
	Dubuque, Iowa	27	4,781	27	894	1	141			55	5,816			55	5,816
Fifth	Boston, Mass.	140	374,008	17	3,309			10	9,381	167	386,698	15	54,793	182	441,491
	Bangor, Maine	5	10,313	21	750					26	11,063	2	1,106	28	12,169
	New London, Conn.	21	12,898	15	827					36	13,725			36	13,725
	Portland, Maine	28	20,773	16	643			6	7,813	50	29,229			50	29,229
	Providence, R. I.	38	77,166	15	16,064			4	4,916	57	98,146			57	98,146
Sixth	Louisville, Ky.	15	3,012	9	1,110					24	4,122			24	4,122
	Evansville, Ind.	16	7,101	8	486					24	7,587			24	7,587
	Memphis, Tenn.	39	11,014	8	361					47	11,375			47	11,375
	Nashville, Tenn.	34	6,684	5	215					39	6,899			39	6,899
Seventh	Pittsburgh, Pa.	52	13,248	11	275	1	320			64	13,843			64	13,843
	Cincinnati, Ohio	25	8,724	5	184	1	153			31	9,061			31	9,061
	Point Pleasant, W. Va.	24	4,185	8	903	1	109			33	5,197			33	5,197
Eighth	Detroit, Mich.	71	186,079	8	20,203			1	658	80	206,940	2	4,054	82	210,994
	Chicago, Ill.	66	206,464	10	13,578					76	220,042			76	220,042
	Duluth, Minn.	48	175,310							48	175,310			48	175,310
	Grand Haven, Mich.	21	40,950	9	667					30	41,617	1	47	31	41,664
	Marquette, Mich.	21	22,109	7	369					28	22,478	2	1,111	30	23,589

VESSELS INSPECTED AND CERTIFICATES OF INSPECTION ISSUED TO STEAM AND MOTOR VESSELS AND TO BARGES—Continued

CERTIFICATES OF INSPECTION ISSUED BY DISTRICTS—Continued

Supervising district	Local district	Domestic vessels										Foreign passenger steam and motor vessels		Total	
		Steam vessels		Motor vessels		Passenger barges		Sea-going barges		Total					
		Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage	Number	Gross tonnage
Eighth	Milwaukee, Wis.	51	154,896	7	3,063					58	157,959			58	157,959
	Port Huron, Mich.	15	10,378	7	210					22	10,588	2	12,170	24	22,758
Ninth	Cleveland, Ohio	98	415,446	2	879					100	416,325			100	416,325
	Buffalo, N. Y.	144	476,917	2	2,738	3	340			149	479,995	8	20,264	157	500,259
	Oswego, N. Y.	17	12,360	19	2,258					36	14,618	6	2,100	42	16,718
	Toledo, Ohio	66	252,175	4	277					70	252,452	1	461	71	252,913
Tenth	New Orleans, La.	171	389,079	27	10,732	5	5,961	4	10,825	207	416,597	13	77,785	220	494,382
	Galveston, Tex.	136	607,838	10	10,569	1	945	17	25,958	164	645,310			164	645,310
	Mobile, Ala.	82	281,353	31	1,707			5	4,869	118	287,929	2	8,174	120	296,103
	San Juan, P. R.	4	8,979	5	383					9	9,362	8	41,026	17	50,388
	Tampa, Fla.	13	35,091	15	938					28	36,029			28	36,029
Eleventh	Seattle, Wash.	151	411,576	60	17,014			4	4,185	215	432,775	23	153,753	238	586,528
	Hoquiam, Wash.	9	10,761							9	10,761			9	10,761
	Juneau, Alaska	4	168	24	4,080			2	3,009	30	7,257			30	7,257
	St. Michael, Alaska	4	2,166	15	465					19	2,631	4	4,034	23	6,665
	Total, 1935	3,847	9,462,607	1,293	629,913	19	10,494	277	316,893	5,436	10,419,907	261	3,165,979	5,697	13,585,886
	Total, 1934	4,058	10,050,219	1,292	602,655	16	9,235	301	353,120	5,667	11,015,229	285	3,460,225	5,952	14,475,454
	Increase (+) or decrease (−)	−211	−587,612	+1	+27,258	+3	+1,259	−24	−36,227	−231	−595,322	−24	−294,246	−255	−889,568

VESSELS INSPECTED, BY GEOGRAPHIC DIVISIONS

Pacific coast	573	1,895,750	263	105,933	2	641	12	16,079	850	2,018,403	83	721,539	933	2,739,942
Atlantic coast	1,963	4,221,226	767	449,899	4	1,884	288	258,504	2,972	4,931,513	141	2,318,274	3,113	7,249,787
Western rivers	291	79,186	105	5,393	4	723			400	85,802			400	85,802
Great Lakes	618	1,953,084	75	44,242	3	340	1	658	697	1,998,324	22	40,207	719	2,038,531
Gulf coast	402	1,313,361	83	23,946	6	6,906	26	41,652	517	1,385,865	15	85,959	532	1,471,824
Total, 1935	3,847	9,462,607	1,293	629,913	19	10,494	277	316,893	5,436	10,419,907	261	3,165,979	5,697	13,585,886

CERTIFICATES WITHDRAWN OR REFUSED

Vessels from which certificates of inspection were withdrawn	18
Vessels refused certificates of inspection:	
Domestic steam vessels	50
Domestic vessels propelled by gas, fluid, naphtha, or electric motor	8
Total	76

CARGO VESSELS EXAMINED TO CARRY PERSONS IN ADDITION TO CREW

During the year ended June 30, 1935, 1,186 cargo vessels were examined to carry persons in addition to crew, under the provisions of the act of Congress approved June 5, 1920.

LIFE-SAVING APPARATUS INSPECTED AT FACTORIES

Kind	Inspected	Passed	Rejected
New cork-ring life buoys	6,129	6,123	6
New lifeboats	29	29	
New life rafts	14	14	
New wood floats	34	34	
New boat davits	24	24	

NEW LIFE PRESERVERS INSPECTED

Kind	Inspected	Passed	Rejected
Block cork	93,941	93,908	33
Balsa block	10,380	10,342	38
Kapok	9,032	9,008	24
Tule	423	423	
Total, 1935	113,776	113,681	95
Total, 1934	127,230	127,100	130
Decrease	13,454	13,419	35

WORK PERFORMED BY INSPECTORS IN CENTRAL OFFICE

Vessels inclined	92
Reinspections of vessels	35

BOILERS

Boilers inspected:	
Steel (riveted plates)	7,483
Iron (riveted plates)	32
Pipe	2,085
Total	9,600
Boilers found defective:	
Gave way under hydrostatic pressure:	
Steel (riveted plates)	121
Pipe	4
Total	125

Boilers found defective—Continued.	
Defective from other causes:	
Steel (riveted plates)	1, 164
Iron (riveted plates)	4
Pipe	211
Total	2, 379
Boilers condemned from further use	42
Defects in boilers and attachments:	
Sheets	193
Heads	209
Steam and mud drums	273
Flues and tubes	57, 809
Steam pipes	236
Stay bolts	19, 980
Braces	456
Other parts	9, 792
Total	88, 953

MARINE-BOILER PLATES TESTED

Inspected by assistant inspector at—	Plates rejected because of—						Total		
	Tensile strength	Surface defect	Light gage	Heavy gage	Lost	Lamination	Inspected	Rejected	Accepted
Chicago, Ill.	1						20	1	19
Cleveland, Ohio	1	2					59	3	56
Coatesville, Pa.	1	11	3	11		14	640	40	600
Philadelphia, Pa.							90		90
Pittsburgh, Pa.						5	219	5	214
Total, 1935	3	13	3	11		19	1, 028	49	979
Total, 1934	3	2	1	3	1	20	736	30	706
Increase (+) or decrease (−)		+11	+2	+8	−1	−1	+292	+19	+273

STATISTICS CONCERNING SHIPS' PERSONNEL

OFFICERS LICENSED

Local district	Steam and motor vessels					Steam vessels		Motor vessels		Sail vessels of over 700 gross tons		Masters of barges of over 100 gross tons	Total
	Masters	Mates		First-class pilots	Second-class and special pilots	Chief engineers	Assistant and special engineers	Engineers	Operators	Masters	Chief mates		
		Ocean	Inland										
San Francisco, Calif.	381	253	43	4		414	358	182	620	46	3		2, 304
Honolulu, Hawaii	27	14		4		15	19	9	123	2			213
Los Angeles, Calif.	128	86	2	5	19	101	88	69	499	7	1		1, 005
Portland, Oreg.	65	17	15	1		66	56	42	232	5			499
New York, N. Y.	1, 027	527	42	81	3	1, 237	859	419	1, 194	48	1	1	5, 439
Albany, N. Y.	55	2	12	37	8	91	7	23	40				275
New Haven, Conn.	29	9	2	3	2	23	9	12	156	2			247
Philadelphia, Pa.	149	154	8	25	9	322	177	89	986	5			1, 824
Norfolk, Va.	123	33	4	26	9	111	55	48	410	2			821
Baltimore, Md.	201	81	5	28	13	161	107	75	422	7	1		1, 101
Charleston, S. C.	24	10	1	9	3	22	15	14	154	1			253
Jacksonville, Fla.	76	56		10	5	45	59	47	549	9			856
Savannah, Ga.	21	18	2	2		28	20	9	72	2			174
St. Louis, Mo.	30	2	19	21		35	44	21	243				415
Dubuque, Iowa	11		9	4		12	5	3	148			2	194
Boston, Mass.	205	177	4	16	3	168	161	40	366	18			1, 158
Bangor, Maine	36	25	1		4	29	25	22	125	9			276
New London, Conn.	27	15	4	3		29	9	23	235	2			347
Portland, Maine	50	61	1	3	3	53	20	16	139	11			347

STATISTICS CONCERNING SHIPS' PERSONNEL—Continued

OFFICERS LICENSED—continued

Local district	Steam and motor vessels					Steam vessels		Motor vessels		Sail vessels of over 700 gross tons		Masters of barges of over 100 gross tons	Total
	Masters	Mates		First-class pilots	Second-class and special pilots	Chief engineers	Assistant and special engineers	Engineers	Operators	Masters	Chief mates		
		Ocean	Inland										
Providence, R. I.	44	38	9	7	5	41	20	15	142	8	------	------	309
Louisville, Ky.	19	------	5	10	------	19	5	9	59	------	------	------	126
Evansville, Ind.	11	------	5	7	1	14	4	6	70	------	------	------	118
Memphis, Tenn.	12	------	9	6	1	38	6	9	95	------	------	------	176
Nashville, Tenn.	6	------	7	7	------	17	7	10	95	------	------	------	149
Pittsburgh, Pa.	32	------	17	7	1	38	17	4	87	------	------	------	203
Cincinnati, Ohio	20	------	16	9	------	12	11	3	54	------	------	------	125
Point Pleasant, W. Va.	8	------	9	10	3	12	2	7	63	------	------	1	115
Detroit, Mich.	68	10	------	33	1	102	49	11	84	------	------	------	358
Chicago, Ill.	36	9	------	18	9	65	42	12	152	------	------	------	343
Duluth, Minn.	18	------	------	14	4	18	14	4	59	------	------	------	131
Grand Haven, Mich.	25	1	------	10	2	33	24	4	81	------	------	------	180
Marquette, Mich.	12	1	------	15	4	20	10	2	76	------	------	------	140
Milwaukee, Wis.	52	3	------	30	2	58	28	19	52	------	------	------	244
Port Huron, Mich.	43	------	------	15	1	49	51	1	20	------	------	------	180
Cleveland, Ohio.	65	7	1	76	------	113	86	17	80	------	------	------	445
Buffalo, N. Y.	71	4	------	39	12	100	46	10	98	------	------	------	380
Oswego, N. Y.	15	1	2	8	2	31	16	9	185	------	------	------	269
Toledo, Ohio	16	1	------	18	1	25	27	5	94	------	------	------	187
New Orleans, La.	176	85	15	32	30	242	147	84	255	10	------	------	1,077
Galveston, Tex.	110	58	------	13	15	94	67	30	310	2	------	------	697
Mobile, Ala.	68	36	2	10	5	69	46	22	220	7	------	------	435
San Juan, P. R.	16	8	------	1	2	9	17	3	38	2	------	------	98
Tampa, Fla.	20	12	------	1	3	20	24	29	362	3	------	------	474
Seattle, Wash.	161	101	35	2	5	133	114	98	299	12	1	------	961
Hoquiam, Wash.	12	8	3	------	2	11	4	7	8	2	------	------	57
Juneau, Alaska	21	11	4	4	6	6	3	24	203	1	------	------	283
St. Michael, Alaska	2	------	1	------	------	3	1	4	51	------	------	------	62
Total, 1935	3,824	1,902	314	685	198	4,254	2,981	1,623	10,105	223	7	4	26,120
Total, 1934	3,653	1,773	412	731	196	4,308	2,756	1,522	9,413	192	9	3	24,968
Increase (+) or decrease (−)	+171	+129	−98	−46	+2	−54	+225	+101	+692	+31	−2	+1	+1,152

RESULTS OF ACTION AGAINST LICENSES

Licenses suspended	108
Licenses revoked	13
Licenses refused	180
Licenses canceled	36
Violations of the law:	
Cases investigated	1,068
Cases dismissed	831
Cases reported to district attorneys and chief officers of customs	81
Number of appeals from decisions of local boards	26
Decisions of local boards reversed by supervising inspectors	8
Decisions of local boards modified by supervising inspectors	8
Decisions of local boards sustained by supervising inspectors	10

EXAMINATIONS FOR COLORBLINDNESS

During the year ended June 30, 1935, 6,069 applicants for original licenses and for renewals of licenses were examined for visual defects, 57 of whom were found colorblind, or had other visual defects, and were rejected, and 6,012 were passed. As compared with the previous year, these figures show a decrease of 972 in the number examined and of 980 in the number passed.

CERTIFICATES OF SERVICE ISSUED TO ABLE SEAMEN AND TO LIFEBOAT MEN

ABLE SEAMEN

Issued by—	Applications received	Applications rejected	Certificates issued
INSPECTION DISTRICT			
San Francisco, Calif.	507	10	497
Honolulu, Hawaii	186	14	172
Los Angeles, Calif.	413	64	349
Portland, Oreg.	84	15	69
New York, N. Y.	743	30	713
New Haven, Conn.	11	1	10
Philadelphia, Pa.	315	19	296
Norfolk, Va.	325	10	315
Baltimore, Md.	456	101	355
Charleston, S. C.	45	7	38
Jacksonville, Fla.	168	9	159
Savannah, Ga.	71		71
Boston, Mass.	332	20	312
Bangor, Maine	25		25
New London, Conn.	29		29
Portland, Maine	49	5	44
Providence, R. I.	136	13	123
Detroit, Mich.	137	30	107
Chicago, Ill.	75	5	70
Duluth, Minn.	48	3	45
INSPECTION DISTRICT—CON.			
Grand Haven, Mich.	23	4	19
Marquette, Mich.	16	4	12
Milwaukee, Wis.	51	1	50
Port Huron, Mich.	38	15	23
Cleveland, Ohio	219	24	195
Buffalo, N. Y.	88	8	80
Oswego, N. Y.	8	3	5
Toledo, Ohio	71	5	66
New Orleans, La.	181	4	177
Galveston, Tex.	124	6	118
Mobile, Ala.	124	6	118
San Juan, P. R.	21		21
Tampa, Fla.	34	1	33
Seattle, Wash.	291	30	261
Hoquiam, Wash.	9	1	8
Juneau, Alaska	68	11	57
Total, 1935	5,521	479	5,042
Total, 1934	5,365	444	4,921
Increase	156	35	121

LIFEBOAT MEN

Local inspectors of vessels:			
San Francisco, Calif.	93		93
Honolulu, Hawaii	328	125	203
Los Angeles, Calif.	439	104	335
Portland, Oreg.	34		34
New York, N. Y.	192		192
Albany, N. Y.	12		12
New Haven, Conn.	1		1
Philadelphia, Pa.	60		60
Norfolk, Va.	60		60
Baltimore, Md.	308		308
Charleston, S. C.	5		5
Jacksonville, Fla.	496	1	495
Savannah, Ga.	55		55
Boston, Mass.	416		416
Bangor, Maine	22		22
New London, Conn.	54		54
Portland, Maine	8		8
Providence, R. I.	234		234
Detroit, Mich.	68		68
Chicago, Ill.	5		5
Grand Haven, Mich.	1		1
Milwaukee, Wis.	7		7
Port Huron, Mich.	7		7
Cleveland, Ohio	68		68
Buffalo, N. Y.	7		7
Toledo, Ohio	7		7
New Orleans, La.	253	3	250
Galveston, Tex.	27		27
Mobile, Ala.	52	18	34
San Juan, P. R.	2		2
Tampa, Fla.	11		11
Seattle, Wash.	502	32	470
Hoquiam, Wash.	16	1	15
Local inspectors of vessels—Con.			
Juneau, Alaska	236	26	210
St. Michael, Alaska	6		6
Total by local inspectors	4,092	310	3,782
Navy Department, navy yards:			
New York, N. Y.	881	717	164
Portsmouth, Va.	149	26	123
Receiving station, Philadelphia, Pa.	120	1	119
U. S. Coast Guard, Treasury Department	9,811	5,911	3,900
Coast and Geodetic Survey, Department of Commerce	266	208	58
Bureau of Lighthouses, Department of Commerce	1,296	1,010	286
Massachusetts nautical school ship *Nantucket*	62		62
California nautical school ship *California State*	34		34
New York State Merchant Marine Academy	74		74
Total, 1935	16,785	8,183	8,602
Total, 1934	15,161	5,253	9,908
Increase (+) or decrease (−)	+1,624	+2,930	−1,306

TRANSPORTATION AND LOSS OF LIFE

PASSENGERS CARRIED

During the fiscal year 236,260,737 passengers were carried on vessels that are required by law to report the number of passengers carried. Dividing this number by 166, the total number of passengers lost, shows that 1,423,257 passengers were carried for each one lost.

LIVES SAVED

During the year 844 lives were directly saved by means of the life-saving appliances required by law.

LIVES LOST ON VESSELS SUBJECT TO INSPECTION, BY CUSTOMHOUSE DISTRICTS

Cause	First		Second		Third		Fourth		Fifth		Sixth		Seventh		Eighth		Ninth		Tenth		Eleventh		Total	
	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew	Passengers	Crew
Stranding: Passenger vessels									2														2	
Fire: Passenger vessels			89	35																			89	35
Collision.																								
Passenger vessels			14	35																			14	35
Nonpassenger vessels				5								1				4				2				12
Foundering: Nonpassenger vessels						7										4								11
Explosion:																								
Passenger vessels				1																				1
Nonpassenger vessels				1																2				3
Sinking: Nonpassenger vessels				2																				2
Accidental drowning:																								
Passenger vessels				3	1	1									1	1	1		2				5	5
Nonpassenger vessels				8		2		2		1		3		2				1		3				22
Suicide:																								
Passenger vessels	12	1	8	1	3		1		2								1		1				28	2
Nonpassenger vessels		1	1	3		1										1				2			1	8
Miscellaneous:																								
Passenger vessels	9	9	9	2	6	5			2							2		1	1	3			27	22
Nonpassenger vessels		3		9		4				2						2				5		1		26
Total:																								
Passenger vessels	21	10	120	77	10	6	1		6						1	3	2	1	4	3			165	100
Nonpassenger vessels		4	1	28		14		2		3		4		2		11		1		14		1	1	84
Grand total	21	14	121	105	10	20	1	2	8	3		4		2	1	14	2	2	4	17		1	166	184
Last year	28	11	19	29	3	16	2	5	2	3		4	2	4	4	4	1	4	2	13	6	4	69	97
Increase (+) or decrease (−)	−7	+3	+102	+76	+7	+4	−1	−3	+4				−2	−2	−3	+10	+1	−2	+2	+4	−6	−3	+97	+87

The total number of lives lost from all causes, passengers and crew, was 350, an increase of 184 over the previous year. Of the lives lost, 146 were from suicide, accidental drowning, and other causes beyond the power of the service to prevent, leaving a loss of 204 chargeable to such accidents as fire, collision, foundering, etc.

ACCIDENTS RESULTING IN LOSS OF LIFE

The total number of accidents resulting in loss of life during the year was 51.

The following disasters resulted in an unusual loss of life:

On September 8, 1934, the steamer *Morro Castle* burned off the coast of New Jersey. As a result of this disaster, 124 persons lost their lives, 89 of whom were passengers and 35 were members of the crew. The *Morro Castle*, a vessel of 11,520 gross tons, was en route from Habana to New York.

On the evening of January 24, 1935, the passenger steamer *Mohawk*, of 5,896 gross tons, bound for Habana, collided with the Norwegian motor ship *Talisman* about 6½ miles south of the Sea Girt Lighthouse. The *Mohawk* sank about 10:30 p. m., with a loss of 14 passengers and 31 members of the crew.

VESSELS LOST

Steam vessels	28
Motor vessels	9
Barges	12
Total	49

VALUE OF PROPERTY LOST

By explosion or accidental escape of steam	$273, 119
By wreck or founder	2, 709, 962
By collision	1, 483, 401
By fire	6, 016, 753
By snags	108, 586
From miscellaneous causes	1, 798, 787
Total	12, 390, 608

NAVIGATION PATROL SERVICE

There are over three hundred thousand small motor vessels operating on the waters of the United States. In order to protect the lives of the millions of persons annually carried by these small craft, certain laws have been enacted by Congress. The Bureau is charged with the enforcement of these laws, and for this purpose operates a small fleet of patrol vessels. This fleet consisted of five vessels at the start of the year and was augmented by an additional sea-going vessel at the end of the year. This latter vessel was assigned to work in New England waters which had not been patrolled in recent years as no boat was available for this purpose.

The fines and penalties collected by this service render it in part self-sustaining. Through the operation of these vessels, together with the cooperation of motorboat owners, yacht clubs, marine associations, etc., a reasonable compliance with the law is maintained. Of the 7,493 violations of the law reported during the

year, 4,290 were reported by the Bureau's patrol vessels. The amount of work done by these vessels is more clearly indicated by the total number of inspections during the year, which was approximately 25,500.

The following is a comparative statement of violations of the navigation laws, 1930–35:

Port	1930	1931	1932	1933	1934	1935
Baltimore	746	584	471	485	374	263
Boston	441	509	693	250	205	130
Bridgeport	182	163	63	165	100	132
Buffalo	43	83	24	21	94	63
Charleston	68	49	52	45	77	84
Chicago	49	37	24	123	12	10
Cleveland	172	167	180	83	110	108
Detroit	234	185	191	174	85	382
Duluth	30	27	20	3	4	6
Galveston	32	39	65	15	33	117
Honolulu	32	15	35	68	80	96
Indianapolis	12	4	4	2	2	1
Juneau	58	47	71	52	41	40
Los Angeles	336	400	237	278	167	215
Louisville	8	9	15	49	4	17
Memphis	35	48	54	87	15	5
Milwaukee	26	9	2	28	6	3
Mobile	76	95	209	171	133	218
New Orleans	217	187	937	755	519	750
New York	951	828	589	2,598	1,733	1,721
Nogales	2		5			
Norfolk	448	223	214	335	65	401
Ogdensburg	36	28	21	9	35	9
Pembina	1		1			2
Philadelphia	568	511	340	498	202	134
Pittsburgh	23	9	21	13	27	6
Port Arthur	24	26	13	120	34	49
Portland, Maine	264	315	370	50	32	55
Portland, Oreg	86	129	118	87	45	83
Providence	103	47	151	16	12	13
Rochester	75	86	37	34	108	73
St. Albans	41	170		1	3	4
St. Louis	9	6	4	4	10	12
St. Paul		2	11			
San Antonio	16	72	44	46	4	76
San Diego		22	30	9	14	33
San Francisco	327	232	252	202	143	305
San Juan	10	23	15	17	11	25
Savannah	105	91	90	84	69	192
Seattle	336	581	1,176	450	340	343
Tampa	977	928	1,037	1,688	790	1,274
Wilmington	218	196	116	37	69	43
Total	7,417	7,187	8,062	9,152	5,807	7,493

PREVENTION OF OVERCROWDING OF PASSENGER VESSELS

Under the law, the certificates of inspection of vessels specify the number of passengers they may carry with safety. To prevent the taking on of passengers in excess of the number so fixed, the Bureau employs approximately 49 inspectors who count such passengers and, when the limit is reached, prevent additional persons from going on board.

During the year 6,371,604 passengers going on excursion boats were so counted. The following table shows these counts by services.

Port	Inspectors						Total	
	Navigation		Local		Customs			
	Counts	Passengers	Counts	Passengers	Counts	Passengers	Counts	Passengers
Baltimore	2,193	945,802	169	100,736			2,362	1,046,538
Boston					458	392,495	458	392,495
Bridgeport					1	1,234	1	1,234
Buffalo			122	67,259	1,143	518,223	1,265	585,482
Chicago	1,313	323,133	5	2,508			1,318	325,641
Cleveland	314	319,796	29	26,247	28	10,644	371	356,687
Detroit	315	381,423	24	18,450	23	31,501	362	431,374
Duluth	195	23,276	25	5,700			220	28,976
Galveston			8	1,002	19	2,112	27	3,114
Indianapolis					14	10,910	14	10,910
Louisville	18	10,149	40	22,389			58	32,538
Mobile	114	1,695					114	1,695
New York			694	201,158	1,517	2,014,556	2,211	2,215,714
Norfolk					78	18,576	78	18,576
Philadelphia			179	63,824	92	66,721	271	130,545
Portland, Maine	104	13,166					104	13,166
Portland, Oreg	27	3,575	10	2,611			37	6,186
Providence	322	88,515	150	46,548	60	14,636	532	149,699
Rochester	21	11,509			7	5,868	28	17,377
San Francisco	49	5,049	79	54,043	785	58,141	913	117,233
Seattle	66	19,348	934	67,692			1,000	87,040
Miscellaneous			1,304	399,384			1,304	399,384
Total, 1935	5,051	2,146,436	3,772	1,079,551	4,225	3,145,617	13,048	6,371,604
Total, 1934	5,225	1,819,656	4,287	1,264,398	3,398	2,494,555	12,910	5,578,609

On 168 occasions it became necessary for inspectors to prevent additional passengers from going on board. This involved the safety of 148,382 passengers. In 1934 there were 127 shut-offs and 92,986 passengers carried.

The following table shows these shut-offs in detail by ports:

Port	July 1934		August 1934		May 1935		June 1935		Total	
	Counts	Passengers	Counts	Passengers	Counts	Passengers	Counts	Passengers	Counts	Passengers
Baltimore	6	5,800	4	3,400					10	9,200
Boston	25	41,630	13	23,874			10	15,424	48	80,928
Chicago			2	198					2	198
Cleveland	2	6,600	2	8,000					4	14,600
Detroit	7	14,400							7	14,400
New York	2	931					73	18,833	75	19,764
Norfolk					2	1,064			2	1,064
Rochester	2	2,000	1	1,000					3	3,000
San Francisco			4	190	4	1,000	6	1,500	14	2,690
Seattle			3	2,538					3	2,538
Total	44	71,361	29	39,200	6	2,064	89	35,757	168	148,382
Total, 1934									127	92,986

PATENT OFFICE

VOLUME OF BUSINESS

It is natural and inevitable that by reason of its constant and intimate relation with industry the Patent Office should be a sensitive and trustworthy barometer of business. That it is such is verified by the experiences of the last 90 years. Almost every economic disturbance in the United States during this period has left in the Patent Office a record of its presence and disappearance. Thus, for example, the effects of the "panics" of 1857, 1869, 1873, and 1893 are chronicled in the statistics of the Office. The same is true of the depression just now passing. A few figures may be cited to reveal its trend. In 1929 and 1930, when our national prosperity had reached its peak, the number of applications for patents and trade marks filed in the Office during the fiscal year ended June 30, 1930, was 117,790. Then followed the financial and industrial dislocations which have continued down to the present. Forthwith the business of this Office reflected these conditions. In the fiscal year 1933 the total of applications received was only 79,822, a shrinkage of 32 percent in the interval between June 30, 1930, and the close of the fiscal year 1933. During the fiscal year 1934 the decline was halted. The volume of new business was approximately equal to that of the preceding year.

With faith in this barometer which for nearly a century has so unfailingly recorded the coming and going of many financial and industrial storms, there can now be read its signs betokening the approach of fair weather. Except for the receipt of final fees, virtually all the activities of the Office show increases compared with the previous year. A greater number of applications were filed; more letters were received; more printed copies were sold; a larger number of deeds of assignment were recorded; and there were more demands for certified copies and photostats.

A grand total of 81,248 applications was filed in 1934–35, compared with 79,690 in the preceding year. The increase was 1,558, or nearly 2 percent. New applications for patent filed with fees numbered 56,832, exceeding by 737 the total of 56,095 received in 1933–34. There was a slight decrease in the number of applications for trade marks; that is, a drop from 16,317 in the preceding 12 months to 15,617 this year. This recession, however, is accounted for by a cessation in the activity surrounding prohibition repeal and is more than offset by a heavy increase—nearly 25 percent—in the filing of applications for design patents. In the fiscal year 1934 there were 3,811 such applications. In this fiscal year there were 5,069.

In the autumn of 1933 there was created the Design Division as a separate unit of the Office. It had previously been integrated with

a division concerned with mechanical patents. The service the Division is now rendering to industry and mercantile business and its earnings have fully justified the action.

SURPLUS

For the second year in succession the Patent Office operated within its income. The receipts from all sources were $4,264,874.67. Expenditures totaled $4,153,591.21. The surplus of receipts above expenditures was therefore $111,283.46.

From 1923 to 1933, both inclusive, the expenditures of the Office exceeded receipts by amounts ranging annually from $85,535 to $827,342.

CONDITION OF THE WORK

Along with an increase in the number of applications received in the Office there has been a gain also in the disposition of pending cases. It is gratifying to be able to report that the work of the Office has been brought more nearly to date than it has been for many years. The work of all of the clerical divisions is current. The work of the Design Division is within 30 days, which is considered current.

In the report of this Office for 1933 it was said that "the constant endeavor of the Patent Office should be to bring its work into such condition that patent applications, both amended and new, may be acted upon within 60 days. Unless this is accomplished during the period in which work is at a comparatively low ebb, as it is at present", it was pointed out, "the desired result may never be attained." The effort then urged has been made. In consequence, 17 of the 65 examining divisions in charge of applications for mechanical patents are now within 2 months of current. Fifty-six are within 3 months and all are within 4 months. In only 9 divisions is it now necessary for inventors to wait more than 3 months for action on their cases.

In the course of the year the number of patent applications awaiting actions was reduced from 39,226 to 31,920, or 18.6 percent. This considerable gain has not been achieved by the mere transference of an application from the status of "awaiting action" to that of "awaiting amendment", since the number of cases finally disposed of has greatly exceeded the aggregate of those received during the year. There was final disposition of 64,599 applications, either by their issuance as patents or through their abandonment. The inventory of June 30, 1935, reported only 106,335 pending applications, or 6,241 fewer than there were at the close of the previous fiscal year.

CLASSIFICATION OF PATENTS

In the annual reports of this Office for each of the two previous years there was emphasized the necessity for a classification of patents both for the sake of the Office and for the benefit of industry. Although lacking appropriations for the purpose, this important task was undertaken during the year and has progressed in a limited way notwithstanding lack of adequate space and personnel. Fourteen examiners and 25 clerks are now engaged in this work. In the

course of the year classes 35, 248, and 311 were revised and published. Classes 138 and 222 were abolished and the patents formerly comprised in them have been reclassified in other classes. About 2,500 patents were transferred from class 64, and 40 new subclasses were created in class 74. Some thousand patents were removed from classes 45 and 99, and 40 new subclasses have been collocated in class 88.

The assignment of additional space and the hope of adequate funds for the Classification Division warrants the hope, if not the prediction, that further progress in this work of reclassification will be achieved during the fiscal year 1935–36.

CHANGES IN THE RULES OF PRACTICE

Since the last annual report of this Office, certain changes have been made in the Rules of Practice, with the purpose of simplifying the procedure and shortening the interval between the declaration of an interference and its final determination. The revision of the Interference Rules was promulgated by order 3281, effective August 21, 1934, and order 3290, effective December 1, 1934. With the design of obviating delays caused by a "bottle neck" in the Interference Division, jurisdiction with respect to motions to dissolve was restored to the Primary Examiners.

Rule 111 was so amended as to provide that the opening of preliminary statements to inspection by the opposing parties shall be deferred until after the disposition of all motions to dissolve and all motions to amend. This change is calculated to eliminate many of the motions which a party previously was free to offer after his cause appeared hopeless and which were in the main in the nature of opposition proceedings.

Rule 107 was changed to permit a party to terminate an interference by filing in writing an abandonment of the contest. By an amendment to rule 116 the presumption of prior inventorship accorded to the senior party by virtue of his filing date is continued in his favor whenever an interference is terminated by dissolution under rule 122 without an award of priority.

THE PATENT OFFICE ADVISORY COMMITTEE

The modifications of the Rules of Practice, referred to in the foregoing paragraphs, are the fruits of long and painstaking study by the Patent Office Advisory Committee which the Secretary of Commerce appointed in July 1933. The committee has continued its investigations for the last 2 years and has made many recommendations looking to the improvement of the practice and the more efficient operation of the Patent Office.

The membership of the committee was this year increased to 15. Its original number was 8.

Notwithstanding that most of its members reside at a distance from Washington and must sacrifice their time and money to attend its meetings, they have nevertheless held sessions in the Patent Office on 52 days. Their earnestness and industry have given the Office the benefit of numerous constructive suggestions.

The present personnel of the committee includes Harlow M. Davis, Boston, Mass., Chairman; William J. Belknap, Detroit, Mich.; Jo Baily Brown, Pittsburgh, Pa.; John A. Dienner, Chicago, Ill.; Franklin E. Hardy, Pittsburgh, Pa.; Carl D. Kelly, Chicago, Ill.; Herman H. Lind, Cleveland, Ohio; Robert L. Lund, St. Louis, Mo.; Justin W. Macklin, Cleveland, Ohio; George Ramsey, New York, N. Y.; Harold C. Smith, Chicago, Ill.; H. B. Spalding, New York, N. Y.; Augustus B. Stoughton, Philadelphia, Pa.; Loyd Sutton, Washington, D. C., and John W. Townsend, Washington, D. C.

REALLOCATION OF JUNIOR EXAMINERS

Some 270 junior examiners who had served in the Office from 3 to 6 years have been reallocated from grade P–1 to grade P–2, with additional compensation. None of these examiners had received an increase of salary since March 1, 1931. Nearly all of them are graduates in law as well as in some one of the branches of engineering. This recognition of the claims of these employees is, it is believed, an investment in behalf of better morale and higher efficiency in the examining corps.

SPECIAL CASES

As the several divisions have become more nearly current in their work, the need for advancing the examination of applications has grown less imperative. The Office, however, has continued through the year its practice of expediting the prosecution of an application upon a showing that the issuance of a patent would result in the investment of idle capital and the employment of labor.

RATIFICATION OF LONDON TREATY

The revisions of the International Convention for the Protection of Industrial Property made in London in 1934 have been ratified by the United States Senate and the treaty as revised awaits the proclamation of the President.

In the following appendix there is presented the usual statistical information regarding the various activities of the Patent Office.

APPENDIX

STATISTICS

Applications received during the fiscal year ended June 30, 1935 [1]

With fees:		
Applications for patents for inventions	56, 832	
Applications for patents for designs	5, 069	
Applications for reissues of patents	513	
		62, 414
Applications for registration of trade-marks	[2] 15, 617	
Applications for registration of labels and prints	2, 969	
		18, 586
Total, with fees		81, 000
Without fees:		
Applications for inventions (act Mar. 3, 1883)	246	
Applications for reissue (act Mar. 3, 1883)	1	
Applications for reissue (rule 170)	1	
Total witnout fees		248
Grand total		81, 248

Applications for patents for inventions with fees

Year ended June 30—		Year ended June 30—	
1926	80, 682	1931	84, 097
1927	84, 511	1932	73, 465
1928	88, 482	1933	59, 408
1929	87, 039	1934	56, 095
1930	91, 430	1935	56, 832

Applications for patents, including reissues, designs, trade-marks, labels and prints, with fees

Year ended June 30—		Year ended June 30—	
1926	110, 030	1931	106, 717
1927	113, 783	1932	93, 859
1928	116, 844	1933	79, 469
1929	114, 496	1934	79, 367
1930	117, 569	1935	81, 000

Patent applications awaiting action

June 30—		June 30—	
1926	43, 765	1931	92, 203
1927	64, 646	1932	76, 723
1928	106, 575	1933	49, 050
1929	103, 236	1934	39, 226
1930	119, 597	1935	31, 920

[1] Including applications in which fees were refunded and transferred.
[2] Includes 2,101 applications for renewal of trade-mark registrations.

Patents withheld and patents expired

	1934	1935
Letters patent withheld for nonpayment of final fees	10,342	7,229
Applications allowed awaiting payment of final fees	22,675	15,949
Patents expired	39,213	37,260
Applications in which issue of patent has been deferred under sec. 4885, Revised Statutes	366	333
Applications in process of issue	3,537	3,245

Patents granted and trade marks, labels, and prints registered

	1931	1932	1933	1934	1935
Letters patent	44,317	52,572	50,766	48,523	41,621
Plant patents		17	52	30	28
Design patents	3,089	2,728	2,934	2,419	3,437
Reissue patents	400	392	375	343	400
Trademarks	12,437	10,901	8,909	10,139	11,109
Labels	1,787	1,492	1,458	1,635	1,908
Prints	678	483	479	535	500
Total	62,708	68,585	64,973	63,624	59,003

Statement of receipts and earnings for the fiscal year ended June 30, 1935

Unearned balance at close of business June 30, 1934		$186,444.31
Collections during fiscal year ended June 30, 1935		4,102,424.68
Total		4,288,868.99
Refundments		23,994.32
Net collections		4,264,874.67
Earnings:		
Inventions, first fees	$1,701,730.00	
Extra claims	32,454.00	
Reissues	15,360.00	
Designs	53,305.00	
Design extensions	23,530.00	
Trade-marks	233,160.00	
Labels and prints	14,622.00	
Total		2,074,161.00
Final fees	1,232,100.00	
Extra claims	27,603.00	
Total		1,259,703.00
Appeals	45,615.00	
Oppositions	9,280.00	
Disclaimers	1,990.00	
Revivals	4,470.00	
Total		61,355.00
Printed copies, etc	347,342.83	
Photoprints	10,477.90	
Photostats	57,584.10	
Manuscript	102,896.60	
Certified printed copies, etc	7,865.64	
Recording articles of incorporation	882.00	
Recording International trade-marks	30.00	
Registration of attorneys	465.00	
Total		527,544.07
Drawings		16,790.21
Assignments		135,833.96
Total earnings		4,075,387.24
Unearned balance June 30, 1935		189,487.43
Net receipts		4,264,874.67

Expenditures, fiscal year ended June 30, 1935

Salaries		$3,100,199.86
Public use of inventions and defending suits		253.89
Photolithographing:		
Current issue, black and white	$47,485.17	
Current issue, color	5,503.00	
Reproduction	39,972.23	
Photographic printing	12,871.87	
Photostat supplies	40,701.02	
Total		146,533.29
Printing and binding:		
Specifications	720,211.75	
Indexes	10,251.02	
Official Gazette	91,956.38	
Total		822,419.15
Miscellaneous		46,557.82
Furniture and filing cases		12,320.41
Contingent expenses, including library stock		25,306.79
Total		4,153,591.21

Receipts and expenditures

Receipts from all sources		$4,264,874.67
Expenditures		4,153,591.21
Surplus		111,283.46
Receipts from sale of Official Gazette and other publications (Superintendent of Documents)		68,000.00

Comparative statement

June 30—	Receipts	Expenditures	Deficit	Surplus
1926	$3,457,774.53	$3,857,952.11	$400,177.58	
1927	3,524,155.55	3,769,604.03	245,448.48	
1928	3,705,338.31	3,839,771.66	134,433.35	
1929	3,783,481.65	4,391,860.16	608,378.51	
1930	4,096,825.43	4,552,685.41	455,859.98	
1931	4,565,377.08	4,832,277.96	266,900.88	
1932	[1] 4,487,508.78	5,314,851.59	827,342.81	
1933	[1] 4,423,563.18	4,588,585.02	165,021.84	
1934	[1] 4,383,468.11	3,876,785.01		$506,683.10
1935	[1] 4,264,874.67	4,153,591.21		111,283.46

[1] This does not include the amount received by the Superintendent of Documents for the Official Gazette and other publications.

Comparative statement of expenditures under separate appropriations

Appropriation	1934	1935
Salaries	$2,761,472.74	$3,100,199.86
Public use of inventions, etc	286.53	253.89
Photolithographing	151,396.60	146,533.29
Printing and binding	890,802.73	822,419.15
Miscellaneous printing and binding	41,125.57	46,557.82
Furniture and filing cases	5,293.68	12,320.41
Contingent expenses, including library stock	26,407.16	25,306.79
Total	3,876,785.01	4,153,591.21

Litigated cases

Patent:			
Interferences declared			2,155
Interferences disposed of before final hearing			1,821
Interferences disposed of after final hearing			230
Interferences awaiting decision			188
Trade mark:			
Interferences declared			244
Oppositions instituted			915
Cancelations instituted			158
Interferences disposed of before final hearing			1,057
Interferences disposed of after final hearing			341
Interferences awaiting decision			29
Before the Board of Appeals:			
Appeals in ex parte cases		2,337	
Appeals in interference cases:			
Priorities	117		
Motions	359		
		476	
			2,813
Ex parte appeals disposed of		2,243	
Appeals in interference cases disposed of:			
Priorities	95		
Motions	222		
		317	
			2,560
Ex parte cases awaiting action		1,149	
Interference cases awaiting action:			
Priorities	57		
Motions	188		
		245	
			1,394
Oldest ex parte case awaiting action, Nov. 21, 1934.			
Oldest interference case awaiting action, May 10, 1935.			
To the Commissioner:			
Appeals in trade-mark interferences	3		
Appeals in trade-mark oppositions	72		
Appeals in trade-mark cancelations	17		
Appeals in ex parte trade-mark cases	28		
Interlocutory appeals	11		
		131	
Petitions to Commissioner:			
Ex parte	6,773		
Inter partes	208		
		6,981	
			7,112
Cases disposed of by Commissioner:			
Appeals in trade-mark interferences	2		
Appeals in trade-mark oppositions	47		
Appeals in trade-mark cancelations	12		
Appeals in ex parte trade marks	12		
Interlocutory appeals	11		
		84	
Petitions disposed of:			
Ex parte	6,773		
Inter partes	208		
		6,981	
			7,065
Notices of appeals to U. S. Court of Customs and Patent Appeals:			
In ex parte cases (including 6 trade marks)		127	
In inter partes cases		34	
In trade-mark oppositions		18	
In trade-mark cancelations		1	
In design applications		4	
			184
To Supreme Court, D. C., in equity suits			78

OTHER DETAILS OF BUSINESS FOR THE FISCAL YEAR

As to the volume of business, the Office received during the year 62,414 applications for patents, reissues, and designs; 13,516 trade-mark applications and 2,101 applications for renewal of trade-mark registrations; and 2,969 label and print applications; 186,833 amendments to patent applications, 7,352 amendments to design applications, and 15,838 amendments to trade-mark, label, and print applications.

The number of letters constituting the miscellaneous correspondence received and indexed was 417,500. In addition, 35,529 letters were returned with information.

The number of printed copies of patents sold was 3,416,727; 1,200,057 copies of patents were shipped to foreign governments, and 765,841 copies furnished public libraries. The total number of copies of patents furnished was 6,098,708, including those for Office use and other departments.

The Office received for record 39,878 deeds of assignment.

The drafting division made 658 drawings for inventors, and corrected 11,924 drawings on request of inventors; 106,871 sheets of drawings were inspected, and 14,890 letters answered.

Typewritten copies of 2,686,500 words were furnished at 10 cents per hundred words. The Office certified to 12,750 manuscript copies, and furnished 6,030 miscellaneous certified copies. The Office also furnished 442,899 photostat copies of manuscript pages; 37,279 photographic copies, and 295,819 photostat copies of publications and foreign patents for sale; 22,840 photostat-manuscript pages; 54 certified manuscript copies and 7,674 photostat copies for Government departments, without charge; 31,526 photostat and 12,137 photographic copies for use of the Patent Office; 15,147 photostat copies for sale through photo-print section, and 120 photostats for Office use; also 70,425 photostats for assignments, grants, and disclaimers for official use; in all, 886,450 photostat and 49,416 photographic copies.

UNITED STATES SHIPPING BOARD BUREAU

GENERAL STATEMENT

This Bureau is charged with the maintenance and development of the American merchant marine, the regulation of carriers by water in interstate and foreign commerce, and (through the Merchant Fleet Corporation) with the administration of the marine insurance fund, the operation of Government lines and terminals, and the custody of the Government's laid-up fleet.

During the fiscal year ended June 30, 1935, the Shipping Board Bureau's principal activities were administered under the supervision of the Director of the Bureau through the following units: Division of Loans and Sales, Division of Regulation, Division of Shipping Research, Division of Traffic, and Section of Public Information. The work of the Merchant Fleet Corporation was carried on, under the direction of the board of trustees and the president of the Corporation, in the offices of the secretary, general comptroller, and treasurer, and in the Division of Operations and the Division of Insurance. The secretary, general comptroller, and treasurer perform similar functions for the Shipping Board Bureau.

Likelihood that the enactment of a new subsidy law would necessitate revision of the present administrative organization and bring about fundamental changes in the system of Government aids to the merchant marine has naturally had an effect on the Bureau's activities during the fiscal year. Pending a clarification of policy, but two small loans were made from the construction loan fund during this period. No ocean-mail contracts were entered into by the Post Office Department, and no requests for certification of the type, size, speed, and frequency of sailings of vessels to be employed on ocean-mail routes were received from the Postmaster General during this period.

Improved administrative supervision of the finances of debtor shipowners was achieved by the Bureau during the year, and the system of joint accounts whereby governmental control is exercised over disbursements from ocean-mail subsidies continued to show improved results. From the companies with which joint accounts are maintained approximately $4,550,000 was collected on construction loans and ship sales notes, including principal and interest, while total collections from debtor shipowners exceeded $28,400,000. It is obvious that the improved status of these accounts will simplify the Government's work if and when it becomes necessary to adjust or modify any of the present ocean-mail contracts.

During the year the Bureau made further progress in its continuing study of marine insurance, the second largest item of expense in the operation of ships. In addition to its annual survey of the

amount of marine insurance written by American companies, the Bureau recently completed its first survey showing the particular market, domestic or foreign, in which American shipowners place their insurance. This survey, which embraced 950 ocean-going vessels (including tankers), of 4,413,000 gross tons, insured for a total of $511,982,000, showed that approximately 15 percent of the risks were covered by self-insurance, the others being about evenly distributed between domestic and foreign underwriters. While these surveys show that a large percentage of the insurance is still placed abroad, they also disclose that the Bureau's policy of fostering the American market has produced beneficial results.

During the year there was a considerable increase in Bureau activities under the regulatory powers vested in the Secretary of Commerce over the rates, fares, charges, and practices of water carriers operating in interstate and foreign commerce. In addition to handling a growing docket of complaint cases and proceedings, and passing upon an increased number of tariffs and conference agreements, the Bureau conducted numerous important regulatory investigations, two of which deserve special mention. One related to the lawfulness of charges and practices of common carriers in the intercoastal trade; the other to unfair methods and practices alleged to be employed by certain foreign-flag carriers to the detriment of American overseas shipping and commerce. It is expected that the issuance of departmental orders based on the findings in these two investigations will go far to stabilize rates and require fair and reasonable practices in both the domestic and foreign trades.

In furtherance of the national policy in regard to Government-owned merchant ships and shipping services, the Merchant Fleet Corporation has continued its program of liquidation. While only three ships were sold and delivered during the year, a complete survey of the laid-up fleet was made, resulting in the classification of the vessels from the standpoint of serviceability. Of the 229 vessels comprising the fleet, 30 were found to be in sufficiently good condition to warrant their preservation for future operation, sale, or charter; 132 were found to have potential value for use in time of national emergency; while 67 were of insufficient value for commercial or military use to justify their further upkeep. This survey will greatly facilitate departmental decisions when offers are received for any of the Government's laid-up tonnage.

Laying the groundwork for further liquidation of the five remaining services which are being operated for Government account, the Merchant Fleet Corporation, after a careful investigation, recommended that three of these services be consolidated. It is expected that the proposed consolidation, which will make for simpler and more efficient operation, and therefore will be a step in the direction of further liquidation, will be effected during the fiscal year 1936.

During the year the Bureau cooperated with the Special Senate Committee to Investigate Air-Mail and Ocean-Mail Contracts, the Postmaster General, and the Interdepartmental Committee on Shipping Policy in their respective investigations and studies of the merchant marine. These investigations disclosed that numerous abuses had developed under the mail-contract system established by

the Merchant Marine Act of 1928, and suggested the wisdom of substituting a system of direct aids for the present construction loans and ocean-mail contracts.

On March 4, 1935, the President in a special message to Congress called attention to the undesirable practices which had grown up under the system of indirect subsidies and recommended the enactment of legislation which should end the subterfuge by providing a system of direct aids. Identical bills (the proposed "Merchant Marine Act, 1935") were introduced in the Senate and House of Representatives on April 15, 1935, but Congress adjourned without enacting a new subsidy law.

Realizing that any change in the subsidy system will involve the preparation of extensive data for use in adjusting the present ocean-mail contracts, the Bureau has been compiling a series of factual statements showing in detail the basis on which each contract was awarded, the financial benefits accruing to the individual contract holders, the amounts due over the remaining life of each contract, and the debit or credit status (with respect to his financial dealings with the Government) of each holder of a contract. It is felt that this and other collateral material now in course of preparation will prove of value in the highly important work of changing from one subsidy system to another.

It is frequently said that shipping is the first industry to feel the effects of a world-wide depression and the last industry to recover. During the fiscal year 1935 American overseas shipping registered moderate gains, somewhat spotty in character, although in the aggregate sufficiently impressive to warrant hope of more substantial gains in the future, despite fluctuations of international exchange, and tariff barriers and other import restrictions which continue to hamper the movement of world trade.

Facing an improved business outlook, American shipowners have one outstanding concern—the growing obsolescence of many of their vessels. It is a fact above dispute that despite the sale of Government ships at market values or less, the granting of construction loans on liberal terms, and the payment of millions of dollars in ocean-mail subsidies during the past 7 years, the United States has the most outmoded and noncompetitive merchant marine of any of the principal maritime nations. The problem of adequate replacements, chiefly of the cargo-liner type, must be dealt with promptly if the American merchant marine is to hold and improve its position on the country's essential trade routes. The Bureau feels that unless the proposed subsidy legislation provides the method and the means by which these replacements can be brought about, there is grave danger of losing the gains made since the war in building up a strong American commercial fleet in the foreign trade.

During the fiscal year a definite agreement was entered into for the construction, with the aid of the construction loan fund, of a new vessel of the *Manhattan-Washington* type to be employed in the highly competitive transatlantic trade as a running mate for the two vessels named and to replace the *Leviathan* which was laid up because of obsolescence. The construction loan fund provisions were utilized because of the urgent requirement of this vessel and because the new form of construction aid had not been provided.

In the following pages will be found brief reports covering the fiscal year 1935 of the various divisions and sections of the Shipping Board Bureau and Merchant Fleet Corporation.

OFFICE OF THE DIRECTOR

The Director administers the activities of the Bureau under policies approved by the Secretary of Commerce. Special committees on finance, regulation, and insurance assist the Director in an advisory capacity and aid in the expeditious handling of matters falling under these heads.

DIVISION OF LOANS AND SALES

The work of this Division during the fiscal year consisted of examining applications for loans from the construction loan fund and submitting recommendations pertaining thereto to the Director of the Bureau; following up outstanding accounts and handling preliminary applications for new loans; analyzing proposals for the purchase of Government-owned merchant vessels under control of the Department of Commerce and evaluating such vessels (this function was transferred to the Merchant Fleet Corporation in February 1935); evolving a method for determining differentials in shipbuilding costs between domestic and foreign shipyards; administering the dieselization fund; developing data relating to the proposed standardization of designs of various classes of merchant vessels; and continuing on a reduced scale the functions of the American Marine Standards Committee.

Construction loan fund.—From the establishment of the construction loan fund to June 30, 1935, inclusive, loans have been authorized to aid in financing the construction of 57 new vessels and the conversion, remodeling, and reconditioning of 42 vessels. These loans total $147,943,642.41, the full amount of which had been advanced prior to June 30, 1935. Loans outstanding on June 30, 1935, totaled $99,841,880.

The financial operations and distribution of the construction loan fund as of June 30, 1935, are shown by the following statement:

Cash and appropriation balance, June 30, 1934, as shown in last annual report		$29, 780, 943. 62
Deposits during fiscal year 1935: Loan repayments		21, 215, 009. 38
Total		50, 995, 953. 00
Advances on loans during fiscal year 1935		337, 833. 00
Cash and appropriation balances, June 30, 1935		50, 658, 120. 00
Distribution of total fund, June 30, 1935:		
Loans:		
Total amount advanced from inception of fund to June 30, 1935	$147, 943, 642. 41	
Total repayments of loans to date	48, 101, 762. 41	
Outstanding loans, June 30, 1935		99, 841, 880. 00
Advances to Diesel fund		9, 500, 000. 00
Cash and appropriation balances, as above		50, 658, 120. 00
Total construction loan fund		160, 000, 000. 00

Formal applications for loans and action taken thereon.—Waterman Steamship Corporation: Loans made during the fiscal year 1935 for the reconditioning of the steamships *Antinous* and *Hastings*, authorization of which was given on July 10, 1934, consisted of $83,675 and $135,430, respectively.

Preliminary applications for loans and action taken thereon.—Certain preliminary applications for loans from the construction loan fund were received during the fiscal year, on which no final action was taken. Applicants were notified that the Department deemed it advisable to hold applications in abeyance pending action on bills before Congress providing for a new form of Government aid to the merchant marine. Preliminary applications were received as follows:

Waterman Steamship Corporation: Under date of September 4, 1934, application was made for loans to aid in financing the conversion and reconditioning of three vessels to be selected from this company's fleet.

American South African Line, Inc.: Under date of February 14, 1935, application was made for a loan to aid in financing the construction of a 14-knot combination passenger and cargo vessel.

American Scantic Line, Inc.: Under date of April 3, 1935, application was made for loans to aid in financing the conversion and reconditioning of the steamship *Minnequa* and a vessel of similar characteristics to be selected from the applicant's fleet.

Under date of May 29, 1935, application was made for loans to aid in financing the reconditioning and conversion of six Hog Island type vessels of the American Scantic Line fleet.

Mississippi Shipping Co., Inc.: Under date of May 7, 1935, application was made for loans to aid in financing the conversion and reconditioning of the steamships *Bibbco* and *Saugerties*, which have been renamed *Delmar* and *Delalba*, respectively.

Preparatory to the submission of a preliminary application for loans to aid in financing the construction of two 16-knot combination passenger and cargo vessels, the Mississippi Shipping Co., Inc., under date of May 15, 1935, submitted tentative plans and specifications. The company was notified that additional information and design data would have to be submitted to the Bureau.

The United States Lines Co. of Nevada.—Under date of March 18, 1935, the United States Lines Co. of Nevada entered into a contract with the Department that the *Leviathan* be permitted to be laid up because of obsolescence and that in substitution thereof there would be constructed a new vessel of the *Manhattan-Washington* type to run with those vessels in the North Atlantic trade. The new vessel was to have been constructed with Government aid to be provided under new legislation and, if no legislation were enacted at the first session of the Seventy-fourth Congress, then the provisions applicable to the construction loan fund were to be made available. Congress not having enacted new subsidy legislation, a definite agreement has been reached with the United States Lines Co. that a construction loan will be granted and a firm contract for the construction of the new vessel is to be made on or before December 16, 1935. This vessel, while of the general type of the *Manhattan* and *Washington*, will have incorporated in its plans provision for three compartmentation throughout and for stability in damaged condi

tion at both light and loaded draft with minimum ballast, adherence to recently developed principles for fire-resisting construction, and the minimization of ship vibration.

Shipbuilding cost differentials.—Anticipating the need of reliable data on this subject in connection with ship-subsidy legislation, the Division evolved a method for determining, with a reasonable degree of accuracy, the difference in shipbuilding costs between domestic and foreign shipyards.

Dieselization program.—During the fiscal year the Division recommended expenditures from the dieselization fund to defray the cost of investigating and correcting defects in designs of machinery installed on certain of the 23 Government-owned merchant vessels under control of the Department of Commerce, which were converted from steam to Diesel propulsion. The engineering work involved was conducted in cooperation with the engine builders under the immediate supervision of the Division of Operations of the Merchant Fleet Corporation.

Of the original fund of $25,000,000 allotted for the dieselization program, a total of $23,665,000 has been allocated. Expenditures for the entire Diesel program have totaled $23,516,539.20, leaving an unexpended balance of $148,460.80 available at the close of the fiscal year.

Standardized types of ships.—The technical unit attached to the Division, in cooperation with the Navy Department, continued to develop basic data and plans for standardizing vessels designed for various commercial trades and for auxiliary naval service in the event of national emergency.

American Marine Standards Committee.—The records of the American Marine Standards Committee are in the custody of the Division. Activities in connection with this committee were confined to issuing publications covering standards which had been previously developed and approved.

DIVISION OF REGULATION

This Division continued to handle matters relating to the regulatory provisions of the Shipping Act, 1916, the Merchant Marine Act, 1920, and the Intercoastal Shipping Act, 1933. Its activities deal with the lawfulness of rates and charges for transportation and the maintenance of files of tariffs establishing such rates by common carriers subject to the provisions of those acts.

Formal docket.—Activities with respect to the formal docket increased materially during the year. Fifty-five formal complaints were filed, and one investigation was instituted on the Bureau's own motion. Fifteen investigations under section 15 of the Shipping Act, 1916; 17 investigation and suspension proceedings, involving proposed changes in rates, rules, and regulations under section 3 of the Intercoastal Shipping Act, 1933; and 1 investigation under section 22 of the Shipping Act, 1916, were instituted. Of the cases pending, 13 complaint cases, 2 proceedings under section 22, 2 section 15 proceedings, and 15 investigation and suspension proceedings were disposed of. There remain still pending 22 cases which have been heard but not decided, and 48 cases which have not been heard.

Two important cases were nearing completion at the end of the fiscal year, one dealing with foreign, the other with intercoastal commerce.

Formal Docket 128, an investigation under section 19 of the Merchant Marine Act, 1920, deals with conditions alleged to be unfavorable to shipping in the foreign trade as a result of competitive methods and practices employed by owners, operators, agents, or masters of vessels of foreign countries and with the formulation of rules and regulations, under authority of section 19 of the Merchant Marine Act, 1920, to adjust or meet such conditions, if they are found to exist. A proposed report, condemning certain practices and containing tentative rules and regulations for promulgation by the Department, was served on carriers, and exceptions thereto were filed. On July 12, 1935, the Secretary of Commerce issued an order and report, based on the report of the Bureau, requiring all common carriers by water in the foreign trade of the United States to file, within 30 days of the effective date, all their rates and charges from the United States to foreign countries.

A proceeding in docket 126 was instituted by the Department to determine the lawfulness of the practices, services, and charges of common carriers by water in intercoastal commerce relating to or concerning classification of vessels or lines for rate-making purposes and resulting rate differences; the pooling of revenues and the effect thereof on rates; the receipt, handling, storing, and delivery of property at terminals within port districts; the performance of services in connection with common-carrier service without publication of charges therefor; the publication of charges for services not rendered; the performance of transportation services, or services in connection therewith under private contracts with shippers; the absorption of charges of other carriers with or without tariff authority; and other practices. On April 29, 1935, the Bureau submitted to the Secretary of Commerce its report and findings in this important investigation, and on July 3, 1935, the Secretary issued an order making effective the Bureau's principal recommendations.

In an investigation, *Assembling and Distributing Charge* (vol. 1, U. S. Shipping Board Bureau Reports, p. 380), decided May 13, 1935, the practice of carriers at Los Angeles Harbor of assessing an assembling and distributing charge on general cargo loaded into or discharged from vessels was condemned. This decision also enunciated the important principle that acceptance and delivery of cargo by common carriers by water shall be accomplished at the point where the shipper may deliver his cargo to the carrier for transportation, and the point at destination where cargo may be received.

Informal docket.—On its informal docket the Division endeavors to compose, through correspondence or informal conferences, differences between shippers, carriers, and others with respect to rates, charges, and practices. Forty-one such cases were disposed of during the fiscal year and 10 were awaiting disposition on June 30.

Special docket.—Applications on the special docket differ from complaints on the formal docket, in that the unlawfulness of rates charged is admitted and the carriers, after adjusting rates for future shipments, desire to make reparation for the unlawful charges on past shipments. These applications are examined carefully, in order

to avoid the possibility of what in effect might be rebates to favored shippers. During the fiscal year, 24 applications of carriers, requesting authority to make refunds or waiver of collection of outstanding undercharges were received, of which all but 4 have been granted.

Agreements under section 15, Shipping Act, 1916.—During the period 1,431 new agreements, and cancelations and modifications of agreements between carriers or other persons subject to the Shipping Act, 1916, were approved; 2 were disapproved; 1 approval was withdrawn and the agreement canceled; and 408 were found not in proper form for consideration and the parties thereto so notified. These agreements include arrangements between competing carriers, dealing with the establishment and maintenance of uniform rates, the pooling of revenues, and the spacing of sailings and divisions of traffic. Such agreements tend to eliminate rate wars, thus contributing to rate stability and reducing opportunities for rate wars.

Tariffs.—During the year 4,582 tariff publications, containing changes in rates and fares, were filed for examination in accordance with statutory requirements. Of this number 30 were rejected for failure to give statutory notice or for violation of the Department's rules and regulations governing the construction of tariffs, and 133 were made the subject of correspondence because of violations of prescribed tariff rules. Changes in intercoastal rates or fares were protested in 32 instances, and 17 orders were issued suspending proposed changes and instituting investigations as to their lawfulness. Special permission applications requesting authority to establish rates or fares on less than statutory notice, or desiring a waiver of tariff rules, totaled 167, of which 126 were granted.

The increase in the number of tariff publications filed was due, in part, to increases made by carriers operating on the Atlantic seaboard for the purpose of maintaining their rates on a parity with those established by water carriers subject to the jurisdiction of the Interstate Commerce Commission, under authority of the Commission's decision in Docket 115, *Emergency Freight Charges*, 1935 (208 I. C. C. 4). In line with the established policy of cooperating with the Interstate Commerce Commission in matters of joint interest to carriers subject to the jurisdiction of each regulatory body, carriers subject to the jurisdiction of this Department were granted permission to maintain the parity of rates.

DIVISION OF SHIPPING RESEARCH

The Division continued to maintain records and compile statistics relating to the transportation of the foreign water-borne cargo and passenger traffic of the United States; the intercoastal commerce of the United States; the trade between continental United States and its possessions; the ownership, operation, and general characteristics of vessels of all nationalities of 1,000 gross tons and upward; and to the operating costs on American and foreign vessels in order to arrive at the differentials existing between vessels operating under American and foreign registry. Special studies on shipping and transportation problems were conducted from time to time as required by various governmental agencies.

The records of the Division indicate that during the fiscal year ended June 30, 1935, 3,706 vessels of various nationalities participated in the water-borne foreign trade of the United States, making about 42,500 entrances and clearances and transporting approximately 66 million tons of cargo and 1,450,000 passengers between 158 United States ports and 1,250 foreign ports.

The permanent records of the Division now include data pertaining to the water-borne commerce of the United States for a period of 14 years (1921–34), covering transactions at 356 continental United States ports, 448 ports in outlying possessions, and 2,933 foreign ports, making a total of 3,737 world ports. During this period 2,057 commodities were transported in the water-borne foreign commerce of the United States. The volume of these commodities totaled 1,125,000,000 cargo tons, valued at approximately 87 billion dollars.

During the fiscal year the Division prepared 32 periodical reports, copies of which were issued to Government officials and organizations, transportation companies, financial, industrial, educational, and other institutions. The Division also compiled 128 special reports, 42 of which were for the use of the Shipping Board Bureau and 34 for other Government agencies. The remaining 52 special compilations were prepared for commercial and port organizations, transportation companies, periodical publications, and educational institutions.

The records of the Division for the fiscal year 1935 were compiled from over 90,000 individual reports received from collectors of customs and vessel owners, operators, and agents.

DIVISION OF TRAFFIC

During the year the Division continued its close contact with the remaining five services being operated for Government account. It exercised supervision over the traffic activities of the four managing operators of these lines and assisted them in many ways, particularly with respect to traffic agreements, conference matters, and in their contact with foreign competitive lines. During the year there was an improvement in voyage revenues of most of the Government-owned services.

The Division has supplied the Bureau with traffic data prepared from analyses of cargo and commodity movements and trade conditions in specific services. It has also furnished other Government departments and private individuals with data on ocean freight and passenger rates, steamship services, itineraries, and other information with respect to American-flag services in all trades. Representatives of the Division have continued to attend meetings of conference lines and have taken part in conference deliberations.

The Division helped to conduct the investigation of Government-owned services in the North Atlantic and recommended that three of these services be consolidated in the interest of economy and efficiency of operation.

Egyptian cotton.—A new agreement for the ensuing crop year, involving the movement of approximately 60,000 bales of Egyptian cotton to United States ports, both by direct American-flag steamers and for transshipment via Liverpool in connection with other American ships, was concluded with British lines. The principal movement of the commodity is from Alexandria, Egypt, to New York and

Boston, but under existing trade conditions it was found necessary to extend this agreement to include Port Said as a loading port and Norfolk, Va., and Charleston, S. C., as ports of destination.

Tobacco.—Illustrative of the service rendered by the Division to American ships, was a movement of tobacco from Gulf ports to Spain, secured in cooperation with the Export and Import Bank for the benefit of an American-flag line.

Discontinuance of liquor quotas.—The quota system hitherto imposed on importations of wines and liquors, together with the high import duties on these commodities, have restricted their movement from abroad. Notwithstanding that the quota system was discontinued during the year, the volume of imports of wines and liquors has not shown the increase that was anticipated.

Pooling agreements.—After extended negotiations, in which representatives of the Division took an active part, all but one of the conference lines which operate cargo services from United States Atlantic ports to ports in the Philippine Islands and China entered into a pooling agreement effective January 1, 1935. It is expected that this agreement, which reduced sailings and excess tonnage, will promote stability and improve the position of the Government-owned ships employed in the trade.

West-bound pooling agreement from European continental ports.—The various pooling agreements of February 1, 1933, affecting all conference lines serving United States North Atlantic ports from Antwerp-Rotterdam and Bremen and Hamburg will be dissolved on December 31, 1935, by the withdrawal of most of the lines. Dissatisfaction with respect to the percentages of distribution from the pool is advanced as the reason for this dissolution. It is believed that negotiations will soon be opened for a readjustment of this situation and the formation of other pooling agreements.

SECTION OF PUBLIC INFORMATION

During the year the cooperative study of ports and port facilities, conducted jointly by the Department of Commerce and the Secretary of War, as required by section 8 of the Merchant Marine Act of 1920, was continued by employees of the Section of Public Information. The following port studies were published and distributed:

Port series no. 9: Charleston, S. C., and Wilmington, N. C. (revised 1934).
Port series no. 22: The Panama Canal and Its Ports (revised 1934).
Port series no. 24: The Ports of Northern New England.
Miscellaneous series no. 1: Port and terminal charges at United States ports (1934 edition). 1935 Supplement to port and terminal charges.

The following reports were completed and forwarded to the Government Printing Office:

Port series no. 6: Part 1, Galveston, Tex. (revised 1935).
Port series no. 6: Part 2, Houston, Tex. (revised 1935).
Port series no. 6: Part 3, Texas City and Corpus Christi, Tex. (revised 1935).
Port series no. 10: Savannah and Brunswick, Ga. (revised 1935).
Port series no. 15: Norfolk, Portsmouth, Newport News, and Hampton, Va. (revised 1934).
Port series no. 17: Ports of the Territory of Hawaii (revised 1935).
Port series no. 19: Gulfport and Pascagoula, Miss. (revised 1934).
Port series no. 21: The Ports of Puerto Rico (revised 1935).
Transportation series no. 3: Transportation lines on the Great Lakes.

The section's data on foreign ports, revised and kept current during the year, formed the basis for answers to numerous requests for information on rates, charges, facilities, and conditions at ports throughout the world.

Bureau publicity, including news releases and articles for the press, was prepared in the section for transmission to the Department's Division of Current Information. Daily requests for shipping information, which because of their nature and scope were not referable to other units of the Bureau, continued to be handled by the section.

SECRETARY

The Assistant to Director of the Bureau serves also as secretary of the Merchant Fleet Corporation, and the joint office is the central administrative office of the Bureau and the Corporation.

In addition to these administrative functions, the office performs special assignments, including the investigations and recommendations pertaining to sales to aliens of vessels documented under the laws of the United States, and the surrender of marine documents of vessels covered by preferred mortgages.

Sales to aliens and transfer of registry.—During the past fiscal year 66 vessels with a gross tonnage of 118,873 were approved for sale to aliens with the privilege of transferring to foreign registry. These vessels were either small yachts considered not essential in the development of the American merchant marine or larger vessels of such age and obsolescence as to be uneconomical to operate. Many of the larger obsolescent vessels had become surplus to operating fleets and had been previously replaced by newly constructed modern vessels. Of the 66 vessels, 63 were specifically enumerated for transfer to foreign registry as follows: British 6, of 3,377 gross tons; Canadian 10, of 16,333 gross tons; Cuban 3, of 94 gross tons; Dutch 1, of 49 gross tons; Estonian 1, of 1,661 gross tons; Finnish 1, of 3,116 gross tons; French 3, of 226 gross tons; Italian 10, of 40,323 gross tons; Japanese 15, of 50,239 gross tons; Mexican 2, of 223 gross tons; Newfoundland 2, of 230 gross tons; Nicaraguan 4, of 1,596 gross tons; Panamanian 2, of 390 gross tons; Portuguese 2, of 835 gross tons; and 1 of 13 gross tons to an unspecified foreign flag. Three vessels of 168 gross tons were sold to aliens without intention of documenting them under foreign registry, but to be used in the fishing trade off the Pacific Coast. One charter of an American vessel to an alien was also approved.

Surrender of marine documents.—During the fiscal year ended June 30, 1935, the approval required by section 30, subsection O (a), Merchant Marine Act, 1920, cited as the Ship Mortgage Act, authorizing the surrender of the marine documents of vessels documented under the laws of the United States, was granted for 41 vessels. The surrenders of the documents were occasioned by the change of home port, change of ownership, or change of name of the vessels involved. In granting approvals, positive conditions were imposed that the vessels concurrently be redocumented under the laws of the United States and proper endorsements made to preserve the status of all preferred mortgages recorded against each of said vessels.

MERCHANT FLEET CORPORATION

ORGANIZATION

But one change took place in the officers and board of trustees of the Merchant Fleet Corporation during the fiscal year. On March 1, 1935, Admiral H. I. Cone submitted his resignation, which was accepted by the Secretary of Commerce, March 2, 1935.

At the annual meeting of stockholders on April 17, 1935, the following trustees were elected for the ensuing year:

James Craig Peacock.
South Trimble, Jr.
Otto Praeger.
Huntington T. Morse.
F. G. Frieser.
L. D. Staver.
C. D Gibbons.

At the close of the fiscal year the officers of the Merchant Fleet Corporation were as follows:

President and chairman of the board of trustees	James Craig Peacock.
Vice chairman of the board of trustees	Otto Praeger.
Vice president	T. M. Woodward.
Secretary	S. D. Schell.
Treasurer	C. D. Gibbons.
General comptroller	L. D. Staver.

The President of the Merchant Fleet Corporation, who is also Chairman of the Board of Trustees, has general jurisdiction and management of the Corporation's business and affairs, which he administers through the offices of the Secretary, Treasurer, and General Comptroller and two Divisions (Operations and Insurance). The other officers of the Corporation perform such duties as may be provided by the bylaws and assigned or delegated to them by the President of the Corporation.

The trustees, who are required to be stockholders, are chosen annually and perform substantially the same functions as the board of directors of a private corporation.

DIVISION OF OPERATIONS

This Division continued to administer activities relating to the maintenance and operation of the physical properties of the Bureau and Fleet Corporation. During the year it was composed of the same sections mentioned in the last annual report, with the addition of the Vessel Movement Section. In February 1935 responsibility for negotiating and supervising sales of vessels and maintenance of records in connection with prior and future sales, including the following up of the performance of provisions of sales contracts, except with respect to the collection of amounts due under such contracts, was transferred to the Division from the Division of Loans and Sales.

Vessel operations.—The operation of the five remaining Government-owned cargo lines by four managing operators was continued throughout the year. The names and managing operators of these

lines, together with the number of ships and sailings, are given in the following table:

Line	Ships	Voyages	Managing operators
America France Line	8	52	Cosmopolitan Shipping Co., Inc.
American Hampton Roads-Yankee Line	4	20	Southgate Nelson Corporation.
Oriole Lines	5	34	Do.
American Pioneer Line	12		Roosevelt Steamship Co., Inc.
Australian service		4	
Indian service		9	
Oriental service		11	
American Republics Line	10	38	C. H. Sprague & Son, Inc.
American Gulf Orient Line	[1] 1	[1] 1	Lykes Bros.-Ripley Steamship Co., Inc.
	40	169	

[1] Special voyage in this service made by a vessel withheld from delivery to the purchaser under sales agreement.

The 169 voyages were performed at a cost to the Merchant Fleet Corporation of $1,380,828.60, which represents a decrease of $489,921.40 compared with the cost for the fiscal year 1934. The losses of the America France Line were increased, owing to low revenues, but an improvement in the volume of freight carried by other lines, despite generally higher operating expenses, resulted in a decreased loss for the fleet as a whole. The limitation placed by the Fleet Corporation on the profits of managing operators and the lesser number of voyages also contributed to this reduction. Additional cargo volume in the trades to Australia and India necessitated an increase in the number of sailings of the American Pioneer Line to enable it to maintain its competitive position in these trades. Sailings to Australia were increased from 5 to 9 a year, and those to India from 9 to 12 a year. A conference agreement affecting the Far East trade necessitated a reduction from 10 to 9 in the number of sailings of the American Pioneer Line to the Orient. These changes will not be reflected in the results of operation until the fiscal year 1936.

The total operating loss of the Merchant Fleet Corporation, including its administrative expense and net profit from operation and maintenance of terminals and real estate, as well as the expense of employees assigned to the United States Shipping Board Bureau for the fiscal year 1935, was approximately $1,698,000, as compared with about $2,200,000 for the fiscal year 1934, a reduction of about $502,000.

The investigation of the Government's North Atlantic services, referred to in last year's report, was completed, and a recommendation for the consolidation of the America France Line, American Hampton Roads-Yankee Line, and Oriole Lines, was submitted. This proposal was approved and authorization given to place it into effect during the fiscal year 1936.

The Board of Trustees, with the approval of the Secretary of Commerce, adopted on August 21, 1934, a new form of agreement to cover the operation of the Government's remaining services. However, owing to pending action by the Congress with respect to shipping legislation, this agreement was not placed into effect during the fiscal year. The operating agreement of 1930 was continued in

effect, but with amendments limiting the amount of profit and the cost of administrative expense of the managing operator and permitting cancelation of the contract on 30 days' notice.

Maintenance and reserve-fleet section.—At the close of the fiscal year 1935 there were 229 vessels in the reserve fleet, as compared with 234 at the beginning of the year. The cost of labor and materials at the reserve fleets for maintaining these vessels was $207,655, against $165,870 for the previous year. This increase was the result of additional preservation work. In addition to this expense, which was chargeable to liquidation funds, an amount of approximately $534,000 was chargeable during the year as liquidation expense for work performed by the general administrative organization of the Corporation.

Maintenance and repair materials valued at about $17,660 were released for issue to managing operators, and material valued at about $4,300 was offered for sale to privately owned lines.

During the year the section conducted 502 complete condition surveys and 385 damage and drydocking surveys on mortgaged vessels, and 79 surveys on Government-owned vessels under charter or in the hands of managing operators.

A physical survey of the laid-up vessels in the reserve fleet was performed during the year by a committee composed of representatives of the Navy Department, American Bureau of Shipping, and Merchant Fleet Corporation. The reports and findings of the committee were passed upon by a board of review composed of officials of the same organization. Each of the surveyed vessels was placed in one of three classes prescribed by the board of trustees of the Fleet Corporation, as follows:

Class I. A first reserve for restricted operation, charter, or sale.
Class II. A second reserve for national emergencies.
Class III. Vessels of insufficient value for commercial or military operation to warrant their further preservation.

The board of review reported to the Director of the Shipping Board Bureau that 30 vessels were found to belong in class I, 132 in class II, and 67 in class III.

Supplies section.—This section continued to handle the Fleet Corporation's activities in connection with the purchase, storage, and distribution of materials, supplies, and equipment. Purchases of stores and equipment for active vessels under their control are made by managing operators.

During the year the aggregate of all purchase orders issued by the Merchant Fleet Corporation was about $328,400, of which $114,000 emanated from the Washington office. These purchases included maintenance and repair materials, office supplies and furniture, material for preservation of reserve fleet vessels, and supplies and equipment for the maintenance and repair of Government-owned terminals.

All inventories, including the annual inventories of supplies and materials for use in the reserve fleet and the Shipping Board Bureau terminals, maintenance and repair materials, and inventories of stores and equipment aboard vessels delivered to or redelivered from managing operators and charterers, are supervised by this section. During the year overage and shortage reports on ships' supplies and

equipment on redelivery of Government-owned vessels were prepared and handled to conclusion. In addition, improvements were made in the method of inventorying vessels' stores.

Disability and vessel personnel section.—This section continued its advisory work on nautical problems and rendered numerous written reports and opinions to the Insurance Division and the Solicitor's office. It also continued its supervision over the selection by managing operators of masters and chief engineers for vessels operated for Government account and conducted investigations concerning vessel disabilities and ships' personnel.

During the year a conference was held with representatives of each managing operator, the United States Salvage Association, and the Insurance Division for the purpose of discussing the causes contributing to heavy-weather damage of vessels under the control of the Fleet Corporation, and determining means by which such damage could be reduced.

Terminals and real-estate section.—The properties under the control of the Department which are administered by the Division of Operations consist of 6 marine terminals and 1 tank-storage station, as follows:

Boston: This terminal is leased to Piers Operating Co. for a 5-year period ending June 30, 1939, on the basis of a fixed rental of $65,711 per annum. Although considerable reconditioning of this property was performed during the year, the excess of receipts over expenditures showed a balance favorable to the Government of $1,292.26.

Hoboken: This terminal is under lease to the North Atlantic Terminal Service, Inc., for a period of 5 years ending August 31, 1938, at a rental of 50 percent of the gross revenue derived from the use and operation of the property, with a minimum guaranty rental of $90,000 for the first year and $100,000 for each of the succeeding 4 years. The minimum rental for the lease year commencing September 1, 1934, was reduced, however, to $60,000 because of adverse business conditions. Revenue accruing to the Government from this terminal for the past fiscal year amounted to $76,467.87, while expenditures totaled $73,147.67, leaving a favorable balance of $3,320.20.

Brooklyn: This terminal is under lease to Piers, Inc., for the period March 1, 1934, to December 31, 1936, at a rental of 56 percent of the gross revenues, with a minimum guaranty rental of $150,000 a year. It became necessary, however, to agree to a reduction of the minimum annual rental to $130,000, and this was done, effective March 1, 1935. Subsequently, Piers, Inc., gave notice of cancelation of the lease, to become effective November 1935. Excess of the Government's receipts over expenditures amounted to $108,416 for the year.

Philadelphia: This property is under lease to Philadelphia Piers, Inc., at an annual rental of $162,500 for a period of 5 years from August 3, 1934. Excess of receipts over expenditures amounted to $117,520 for the year.

Norfolk: The Norfolk Tidewater Terminals, Inc., is lessee of this property for the period August 2, 1934, to June 30, 1939. For the fiscal year covered by this report the Government's receipts from rental exceeded its expenditures by $79,405.

Charleston: The Charleston Terminal is under lease to the Port Utilities Commission of Charleston for a term of 5 years from March 1, 1931. On November 8, 1934, an expenditure of $120,000 for essential repairs to this property was approved. The resulting improvements necessitated a supplemental indenture of lease providing for the payment of 66⅔ percent of the annual net income but in no event less than $20,000 a year as rental. Revenue accruing from the operation of this property amounted to $23,829.61 for the year. Maintenance and reconditioning by the Merchant Fleet Corporation amounted to $64,937.98 and miscellaneous expenses to $254.41, resulting in an unfavorable balance to the Government of $41,362.78.

Craney Island: The Craney Island fuel oil station, located in the Elizabeth River near Norfolk, Va., is leased to the Pennsylvania Shipping Co. on a yearly basis, at a rental of $500 per annum, with an option of renewal for a total period not exceeding 5 years from May 1, 1933. The lessee has expended a large sum for repairs and improvements and the property is in excellent condition.

Vessel Movement Section.—The functions performed by this section were largely of a routine nature and during the past year included maintenance of records of sailings on lines sold for guaranteed operation, status records of all vessels owned by the Fleet Corporation, and preparation of statistical statements from such records.

Sales of vessels.—The only vessels sold during the year were 3 cargo vessels, totaling 25,098 dead-weight tons.

Transfer of custody of vessels.—Under an order of the Procurement Division of the Treasury Department dated May 24, 1935, the steamship *Kittery*, ex-Navy transport, was reassigned, without exchange of funds, to the Federal Emergency Relief Administration for use in an oyster pest-control project in the vicinity of Norfolk, Va.

DIVISION OF INSURANCE

Under authority of the Merchant Marine Act, 1928, and as directed by the Shipping Board Bureau, the Merchant Fleet Corporation has continued to maintain and administer the general insurance fund which is used to insure, in whole or in part, the Government's legal or equitable interest in vessel tonnage.

The Fleet Corporation has continued to encourage the placing of hull insurance, on vessels in which the Government has an interest, in the American commercial market, and has rendered assistance to owners of vessels purchased from the Bureau as well as owners of vessels constructed or reconditioned with the aid of the Bureau's construction loan fund, by accepting in the insurance fund the excess of the capacity of the commercial market, and where the shipowner is unable to obtain satisfactory rates in the commercial market, the fund may accept the insurance, in an amount, however, not exceeding the amount of the mortgage debt. In some cases the use of the foreign market has been approved under special circumstances.

As of June 30, 1935, the total coverage in the general insurance fund amounted to $30,542,716, of which $16,162,076 applied to 69 privately owned American-flag vessels and $14,380,640 represented insurance on 47 Government-owned vessels operated in Fleet Corporation services. The total amount of insurance was therefore $6,384,455 less than the amount covered at the beginning of the fiscal year.

The total premiums earned by the general insurance fund from its inception to June 30, 1935, has been $16,260,410. In addition to these premiums $13,595,196.55 has been applied to the fund from other moneys of the Merchant Fleet Corporation in accordance with the law authorizing the creation of the fund. Paid claims and administrative expenses amounted to $13,100,878.

Unsettled claims for which the general insurance fund is liable are estimated at $1,515,069 as of June 30, 1935. Assuming that these claims are settled for this estimated amount, the unobligated balance of the general insurance fund on June 30, 1935, would be $9,329,500.

The examination of commercial policies furnished by owners of vessels mortgaged to the Government has continued to be an important activity. These policies totaled $236,062,682. This insurance is required under the sales and loan mortgages to protect the Government's interest in the vessels.

Commercial protection and indemnity insurance furnished by operators of Government vessels in the amount of $67,000,000 was also examined. Policies covering fire, workmen's compensation, and general liability submitted by lessees of Government pier properties and also automobile liability insurance for the Merchant Fleet Corporation, totaling approximately $10,000,000, were examined. About 200 cases of personal injury of employees of the Fleet Corporation and the Shipping Board Bureau were handled with the United States Employees' Compensation Commission.

The settlement of protection and indemnity claims which arose prior to July 1, 1929, when the United States Protection and Indemnity Agency, Inc., was sold, has progressed favorably. During the year 40 claims were settled for approximately $66,170 and on June 30, 1935, there were 73 pending claims totaling $2,514,252. This includes a number of claims revived by the amendment to the Suits in Admiralty Act of June 30, 1932.

TREASURER

The treasurer's office of the United States Shipping Board Merchant Fleet Corporation handles receipts and disbursements for both the United States Shipping Board Bureau and the Merchant Fleet Corporation. For the fiscal year 1935, the Shipping Board Bureau had a total appropriation of $219,216, of which $145,337.32 was expended and an additional amount of $639.68 committed during the year for salaries and traveling expenses of the Bureau's employees and for expert stenographic services in connection with various hearings. In addition, the transfer from the Shipping Board Bureau appropriation to the Bureau of Navigation and Steamboat Inspection of $5,600, and $1,512 to the Procurement Division, United States Treasury Department, was authorized.

No appropriation from the United States Treasury was made for administrative and operating expenses of the Merchant Fleet Corporation in the fiscal year 1935, but the use of unexpended balances of funds on hand July 1, 1934, and use of operating and liquidation receipts during the fiscal year 1935 were authorized, the latter being limited to $750,000 to defray expenses of liquidation. A brief state-

ment for the several active funds maintained during the fiscal year 1935 by the Merchant Fleet Corporation follows:

Item	Opening balance	Net receipts	Net disbursements	Closing balance
Operating fund	$7,248,364.59	$919,934.71	$1,950,893.00	$6,217,406.30
Dieselization fund	196,805.19		48,344.39	148,460.80
Liquidation fund	472,549.52	3,918,433.87	[1] 3,968,125.27	422,858.12
Insurance fund	8,673,031.19	[1] 4,032,317.49	1,765,648.19	10,941,700.49

[1] Includes $3,325,000 liquidation receipts transferred to insurance fund.

A complete statement of the financial activities of the Shipping Board Bureau and Merchant Fleet Corporation is appended hereto.

Collections.—The collection of current and inactive accounts receivable of the Merchant Fleet Corporation is an important activity of the treasurer's office. During the fiscal year 1,829 current invoices totaling approximately $1,430,000 and insurance premiums totaling $828,000 were collected, and 67 inactive accounts amounting to $2,980,000 were collected, settled, or otherwise closed.

Collections of principal payments on secured accounts due the Shipping Board Bureau and Merchant Fleet Corporation totaled $24,676,320.73, of which $21,215,009.38 applied to construction loan notes and $3,144,189.79 to ship-sales securities. The sum of $3,811,019.97 was collected as interest on notes and other securities, of which $2,917,367.69 applied to construction loan notes.

Amounts collected as repayments of construction loans were redeposited in the construction loan fund, but interest on such loans was covered into the United States Treasury as miscellaneous receipts. Collections of both principal and interest on ship-sales notes, however, were used to defray the expense of maintaining the laid-up fleet and for salaries and expenses of the personnel engaged in liquidation within the $750,000 limitation approved by the 1935 appropriation act. Collections in excess of this total were transferred to the insurance fund, pursuant to title V, section 501, of the Merchant Marine Act, 1928.

While as in the past a number of companies had difficulty in meeting their obligations to the Government, it is of particular interest to note that during the fiscal year eight borrowers from the construction loan fund prepaid notes totaling $10,848,755.54.

Securities.—Owing to heavy collections and the fact that few new construction loan advances or ship-sales deliveries were made, the face value of notes and other securities held for collection dropped from approximately $148,500,000 at July 1, 1934, to $123,300,000 at the end of the fiscal year covered by this report.

Housing properties.—Conveyances of 7 properties and 11 mortgages on properties at Brooklawn, N. J., were made to the Brooklyn Housing Corporation during the year, leaving 47 properties and 72 mortgages, with a total purchase price of $77,180.52, to be conveyed to that corporation, pursuant to the terms of the sales agreements. The expiration date of the contract with this corporation was recently extended to December 31, 1935.

No important changes occurred during the year in the status of other housing properties held by the Bureau.

GENERAL COMPTROLLER

The general comptroller's office, during the fiscal year ended June 30, 1935, continued its regular duties of maintaining the accounting records of the United States Shipping Board Bureau and the Merchant Fleet Corporation; exercising control over "line" and "corporate" accounts of managing operators of Government-owned vessels and of the operation of Government terminal properties; supervising the fiscal operations of delinquent debtors; settling or otherwise disposing of outstanding accounts; and rendering assistance in the defense and prosecution of claims.

In addition to these regular functions, special investigations and studies dealing not only with the Shipping Board Bureau and mail contract lines, but with American-flag services generally, were made at the request of the special Senate Committee to Investigate Ocean- and Air-Mail Contracts, the Interdepartmental Committee on Shipping Policy, the Post Office Department, and others. Analyses and summarized annual reports describing the financial structure and position, as well as the physical and financial activities of all companies subject to section 21 of the Shipping Act of 1916, were also compiled.

STATISTICS

Owing to limitations of space, a few of the statistical statements incorporated in former years in the annual reports of the Shipping Board will be omitted from this report, but will be furnished in mimeographed form to those making application in writing to the Director of the Shipping Board Bureau, Department of Commerce, Washington, D. C.

Summarized consolidated cash statement, by appropriations, for the fiscal year ended June 30, 1935

Code	Caption	Total	U. S. Shipping Board Bureau			
			Expositions, etc	Salaries and expenses		Construction loan fund
				1934	1935	
	Unexpended balance as at June 30, 1934	$51,791,159.64	$2,032.40	$86,377.13	0	$29,726,253.62
	Receipts.					
RA	Appropriations	222,450.09	3,234.09		$219,216.00	
	Sales:					
RB	Sales of vessels, tugs, and/or barges	3,173,531.75				
RC	Sales of assets other than vessels, tugs, and/or barges	14,368.32				
	Total sales	3,187,900.07				
RF	Operation of vessels revenue	22,160.01				
RH	Real-estate operation and rental revenue	771,291.18				
	Other receipts:					
RJ	Interest earned	831,655.00				
RL	Miscellaneous receipts	3,909,387.50			60.21	2,912,218.11
RM	Insurance premiums	829,489.25				
	Total other receipts	5,570,531.75			60.21	2,912,218.11
	Recovered disbursements:					
RDD	Operation of vessels expense	67,202.85				
RDE	Vessel repairs and betterments	262.50				
RDG	Protection and indemnity insurance expense and losses	1,212.64				
RDH	Marine-insurance expense and losses	209,423.86				
RDI	Marine-insurance premiums	548.19				
RDJ	Laid-up vessels expense	45,579.34				
RDL	Real-estate operation and rental expense	22,639.58				
RDO	Warehouse stores	6,984.76				
RDT	Miscellaneous disbursements	21,869,594.91				21,269,699.38
RDU	Administrative salaries	60,338.42			54.90	
RDV	Other general expense	66,849.14		897.36	145.62	
	Total recovered disbursements	22,350,636.19		897.36	200.52	21,269,699.38
	Total receipts	32,124,969.29	3,234.09	897.36	219,476.73	24,181,917.49
	Transfer of funds	4,418,229.78				
	Total	88,334,358.71	5,266.49	87,274.49	219,476.73	53,908,171.11

	Disbursements:					
	Construction, repairs, and/or betterments:					
DC	Real estate and/or equipment	10,223.30				
DX	Dieselization expense	45,454.18				
	Total construction, repairs, and/or betterments	55,677.48				
	Operations out-go vessels					
DD	Operation of vessels expense	1,085,680.92				
DE	Vessel repairs	9,670.86				
DG	Protection and indemnity insurance expense and losses	73,554.74				
DH	Marine-insurance expense and losses	1,793,518.09				
DI	Marine-insurance premiums	7,732.61				
	Total operations out-go vessels	2,970,157.22				
DJ	Laid-up vessels expense	241,257.49				
DL	Real-estate operation and rental expense	375,710.83				
	Other disbursements					
DO	Warehouse stores	62,352.48				
DS	Appropriations returned to U. S. Treasury	118,761.48	2,908.70		15,842.00	
DT	Miscellaneous disbursements	854,046.78				337,833.00
	Total other disbursements	1,035,160.74	2,908.70		15,842.00	337,833.00
	General administrative expense:					
DU	Administrative salaries	1,402,782.12		1.04	142,091.44	
DV	Other general expense	185,354.33	1,007.79	6,170.18	3,479.40	
	Total general administrative expense	1,588,136.45	1,007.79	6,171.22	145,570.84	
	Refunded receipts:					
DRB	Sales of vessels, tugs, and/or barges	250.00				
DRL	Miscellaneous receipts	3,879,663.38		28.80	59.91	2,912,218.11
DRM	Insurance premiums	126,327.47				
	Total refunded receipts	4,006,240.85		28.80	59.91	2,912,218.11
	Total disbursements	10,272,311.06	3,916.49	6,200.02	161,472.75	3,250,051.11
	Transfer of funds	4,418,229.78				
	Unexpended balance as at June 30, 1935	73,643,787.87	1,350.00	81,074.47	58,003.98	50,658,120.00
	Grand total	88,334,358.71	5,266.49	87,274.49	219,476.73	53,908,171.11

Summarized consolidated cash statement, by appropriations, for the fiscal year ended June 30, 1935—Continued

Code	Caption	U. S. Shipping Board Merchant Fleet Corporation							
		Operating fund	1923 claims appropriation	Liquidation fund, 1932-34	Sales receipts		Dieselization fund	Repossessed ships and trade routes	Insurance fund
					Liquidation fund, 1935	In suspense			
	Unexpended balance as at June 30, 1934	$7,248,364.59	$380,746.00	$472,549.52	0	0	$196,805.19	$5,000,000	$8,678,031.19
	Receipts:								
RA	Appropriations								
	Sales:								
RB	Sales of vessels, tugs, and/or barges				$711,937.20	$2,461,594.55			
RC	Sales of assets other than vessels, tugs, and/or barges				1,480.00	12,888.32			
	Total sales				713,417.20	2,474,482.87			
RF	Operation of vessels revenue	22,160.01							
RH	Real-estate operation and rental revenue	771,291.18							
	Other receipts:								
RJ	Interest earned	96,690.90			36,832.80	693,951.00			4,180.30
RL	Miscellaneous receipts	997,109.18							
RM	Insurance premiums								829,489.25
	Total other receipts	1,093,800.08			36,832.80	693,951.00			833,669.55
	Recovered disbursements:								
RDD	Operation of vessels expense	67,202.85							
RDE	Vessel repairs and betterments	262.50							
RDG	Protection and indemnity insurance expense and losses	1,212.64							
RDH	Marine-insurance expense and losses	159,304.80							50,119.06
RDI	Marine-insurance premiums	548.19							
RDJ	Laid-up vessels expense	45,579.34							
RDL	Real-estate operation and rental expense	22,639.58							
RDO	Warehouse stores	6,984.76							
RDT	Miscellaneous disbursements	599,895.53							
RDU	Administrative salaries	60,283.52							
RDV	Other general expense	65,806.16							
	Total recovered disbursements	1,029,719.87							50,119.06
	Total receipts	2,916,971.14			750,250.00	3,168,433.87			883,788.61
	Transfer of funds	893,214.37							3,525,015.41
	Total	11,058,550.10	380,746.00	472,549.52	750,250.00	3,168,433.87	196,805.19	5,000,000	13,086,835.21

	Disbursements:								
	Construction, repairs, and/or betterments:								
DC	Real estate and/or equipment	10,223.30							
DX	Dieselization expense	165.36					45,288.82		
	Total construction, repairs, and/or betterments	10,388.66					45,288.82		
	Operations out-go vessels:								
DD	Operation of vessels expense	1,085,680.92							
DE	Vessel repairs	9,670.86							
DG	Protection and indemnity insurance expense and losses	73,554.74							1,630,637.06
DH	Marine-insurance expense and losses	162,851.03							
DI	Marine-insurance premiums	7,732.61							
	Total operations out-go vessels	1,339,520.16							1,630,637.06
DJ	Laid-up vessels expense	241,257.49							
DL	Real-estate operation and rental expense	375,710.83							
	Other disbursements:								
DO	Warehouse stores	62,352.48							
DS	Appropriations returned to U. S. Treasury	100,010.78							
DT	Miscellaneous disbursements	250,568.85	265,644.93						
	Total other disbursements	412,932.11	265,644.93						
	General administrative expense:								
DU	Administrative salaries	1,203,493.50							57,196.14
DV	Other general expense	122,162.75							52,534.21
	Total general administrative expense	1,325,656.25							109,730.35
	Refunded receipts.								
DRB	Sales of vessels, tugs, and/or barges				250.00				40.00
DRL	Miscellaneous receipts	967,316.56							126,327.47
DRM	Insurance premiums								
	Total refunded receipts	967,316.56			250.00				126,367.47
	Total disbursements	4,672,782.06	265,644.93		250.00		45,288.82		1,866,734.88
	Transfer of funds	15.11		440,713.97	727,611.12	3,168,433.87	3,055.57		78,399.84
	Unexpended balance as at June 30, 1935	6,385,752.63	115,101.07	31,835.55	22,388.88		148,460.80	5,000,000	11,141,700.49
	Grand total	11,058,550.10	380,746.00	472,549.52	750,250.00	3,168,433.87	196,805.19	5,000,000	13,086,835.21

Balance sheet as at June 30, 1935

ASSETS

			Cash	*Unrequisitioned appropriations*	*Total*	
A-1	Cash and unrequisitioned appropriations:					
A-1-1	General cash		$6,418,496.20	$21,480.86	$6,439,977.06	
A-1-2	Insurance fund		11,141,700.49	----------	11,141,700.49	
A-1-3	Claims fund, appropriation act 1923		115,101.07	----------	115,101.07	
A-1-4	Dieselization of vessels		148,460.80	----------	148,460.80	
A-1-5	Operation of vessels taken back from purchasers		----------	5,000,000.00	5,000,000.00	
A-1-6	Construction loan fund		77,183.00	50,580,937.00	50,658,120.00	
A-1-7	U. S. Shipping Board Bureau		6,183.05	134,245.40	140,428.45	
	Total		17,907,124.61	55,736,663.26	73,643,787.87	$73,643,787.87
				Claim offsets		
A-2	Accounts receivable and claims:	*Total*	*Payable offsets*	*and reserves*	*Net receivables*	
A-2-1	Due from sundry debtors	$3,761,035.96	121,371.43	2,750,591.62	889,072.91	
A-2-2	Due from foreign governments	16,779,611.01	18,435.38	16,761,147.03	28.60	
A-2-3	Due from ship sales	1,208,173.71	----------	882,130.53	326,043.18	
A-2-4	Due the insurance fund	194,602.29	----------	----------	194,602.29	
A-2-5	Estimated recoverable value of claims in favor of U. S. Shipping Board Merchant Fleet Corporation	73,328.25	----------	----------	73,328.25	
	Total	22,016,751.22	139,806.81	20,393,869.18	1,483,075.23	1,483,075.23
					Net	
A-3	Notes and mortgages receivable and securities:					
A-3-1	Notes due construction loan fund	99,841,880.00	----------	----------	99,841,880.00	
A-3-2	Notes due from ship sales	19,160,345.68	----------	870,788.32	18,289,557.36	
A-3-3	Notes due from sundry debtors	1,501,536.23	----------	21,630.49	1,479,905.74	
A-3-4	Mortgages due from sundry debtors	177,450.00	12,468.49	128,712.47	36,269.04	
A-3-5	Miscellaneous securities	18,939.32	----------	6,240.00	12,699.32	
	Total	120,700,151.23	12,468.49	1,027,371.28	119,660,311.46	119,660,311.46
			Total	*Reserves*		
A-4	Stores supplies and equipment:					
A-4-1	Reserve Fleet stores and supplies		25,547.09	----------	25,547.09	
A-4-2	Stores and supplies aboard lay-up vessels		305,117.28	185,111.12	120,006.16	
A-4-3	Supplies and equipment in warehouses		740,187.67	----------	740,187.67	
A-4-4	Surplus supplies and equipment in warehouses		570,889.00	428,166.75	142,722.25	
A-4-5	Furniture and fixtures, equipment and automobiles		85,424.15	56,012.33	29,411.82	
	Total		1,727,165.19	669,290.20	1,057,874.99	1,057,874.99
A-5	Fleet: Appraised value of 284 vessels and 18 barges and launches				30,151,529.36	30,151,529.36

A-6	Other properties:	*Cost*			
A-6-1	Terminals and fuel station	10,282,904.01	720,439.22	9,562,464.79	
A-6-2	Shipyards and housing projects	4,843,937.33	4,796,622.83	47,314.50	
A-6-3	Ground rent estate	2,550,000.00		2,550,000.00	
	Total	17,676,841.34	5,517,062.05	12,159,779.29	12,159,779.29
A-7	Deferred accounts and commitment charges				284,385 48
	Total				238,440,743.68
	LIABILITIES				
L-1	Accounts payable and unclaimed wages:	*Total*	*Receivable offsets*	*Net*	
L-1-1	Due sundry creditors	$522,006.10	$108,817.39	$413,188.71	
L-1-2	Due foreign governments	18,463.06	18,435.38	27.68	
L-1-3	Unclaimed wages, salvage awards, and other unclaimed items	1,388,911.83		1,388,911 83	
	Total	1,929,380.99	127,252.77	1,802,128.22	$1,802,128 22
L-2	Deposits on sales and other contracts not consummated	52,024.23	25,022.53	27,001.70	27,001.70
L-3	Commitments				366,840.73
L-4	Reserve for protection and indemnity insurance claims and expenses				2,703,636.20
	Total liabilities for general purposes				4,899,606.85
L-5	Accounts payable from insurance fund				435,265.51
L-6	Reserve for claims and unearned premiums, insurance fund				2,351,037.27
L-7	Reserve for taxes and accounts payable, claims fund				115,101.07
L-8	Reserve for operation of vessels taken back from purchasers				5,000,000 00
	Net worth as at June 30, 1935				225,639,732 98
	Total				238,440,743 68

SCHEDULE 1.—*Cash and unrequisitioned appropriations available for general purposes as at June 30, 1935*

General cash (before adjustment)—Cash in U. S. Treasury, in banks, and in transit to depositories		$6,618,496.20
Unrequisitioned appropriations, U. S. Shipping Board Bureau, 1935		21,480.86
		6,639,977.06
Less—		
Amount to be transferred from operating fund subsequent to June 30, 1935, representing balance of excess sales receipts over liquidation expense requirements		200,000.00
Total excess of sales receipts and liquidation expense requirements	$3,525,000.00	
Less amounts transferred to marine insurance fund during fiscal year 1935 in accordance with authorizations of the Secretary of Commerce.		
Jan. 9, 1935	$1,500,000.00	
June 29, 1935	1,825,000.00	
	3,325,000.00	
	200,000.00	
Total cash available for general purposes as of June 30, 1935		6,439,977.06

The *appropriation acts for each year have appropriated to use of the U. S. Shipping Board Merchant Fleet Corporation the balances of general cash on hand at the beginning of the fiscal year; all amounts received during the year other than the proceeds from the sales of ships and surplus property, and additional amounts from the U. S. Treasury except for the fiscal years 1933, 1934, and 1935. The appropriation acts for each year since 1925 have also appropriated certain amounts of the proceeds from sales as is necessary to meet the expenses of liquidation, including the costs incident to the delivery of vessels to purchasers, the cost of maintaining the laid-up fleet, and the salaries and expenses of the personnel engaged in liquidation.*

The general cash is available for general purposes, including administrative expenses, vessel and terminal operations, maintenance of laid up fleets, and preservation of vessels therein and other miscellaneous activities in connection with the establishment and development of the American merchant marine for which specific appropriations have not been made by Congress.

The general cash, as at June 30, 1935, as above shown, includes the operating funds, liquidation funds, and the fund for the engineering development program which was last available for the fiscal year 1933, viz:

Operations fund	$6,261,460.18
Liquidation fund, fiscal year 1933	13,903.73
Liquidation fund, fiscal year 1934	17,931.82
Liquidation fund, fiscal year 1935	22,388.88
Engineering development program	124,292.45
Total	6,439,977.06

SCHEDULE 2.—*Cash and unrequisitioned appropriations available for expenses of the U. S. Shipping Board Bureau as at June 30, 1935*

Cash:		
Available for salaries and expenses, fiscal year 1935	$4,484.06	
*Available for salaries and expenses, fiscal year 1934	348.69	
*Available for Chicago World's Fair Centennial Celebration (Act June 19, 1934) 1934 and 1935	750.00	
Available for California Pacific International Exposition (Act Mar. 21, 1935), 1935 and 1936	900.00	
Special deposits, symbol 80051	.30	
Total cash		$6,183.05
Unrequisitioned appropriations		
Salaries and expenses, fiscal year 1935	$75,519.62	
*Salaries and expenses, fiscal year 1934	74,064.95	
*Printing and binding, fiscal year 1934	5,760.83	
Total unrequisitioned appropriations		154,245.40
Total cash and unrequisitioned appropriations, U. S. Shipping Board Bureau		140,428.45

Memorandum only:

At the close of business Aug. 9, 1933, the total of unrequisitioned appropriations of the U. S. Shipping Board amounted to *$354,305.32, of which the following disposition was made*

(1) Amount transferred to the Department of Commerce		$255,318.97
(2) Amount taken over by U. S. Treasury as follows:		
Unexpended balance		
Salaries and expenses, fiscal year 1932	$29,202.62	
Salaries and expenses, fiscal year 1933	31,047.15	
Salaries and expenses July 1 to Aug. 9, 1933, inclusive	32,448.21	
Printing and binding, fiscal year 1932	538.85	
Printing and binding, fiscal year 1933	5,659.54	
	98,986.35	
		354,305.32

* Items marked (*) totaling $81,824.47 represent the balances available as of June 30, 1935, of the amount transferred to the Department of Commerce.

† The U. S. Shipping Board Bureau has no control over (2) amounts taken over by the U. S. Treasury, as all transactions relating thereto are handled by the General Accounting Office. A memorandum record of these transactions is kept by the special disbursing clerk of the U. S. Shipping Board Bureau and this record reflects that at June 30, 1935, there is a balance remaining of $60,039.66, of which $27,588.95 represents balances of the 1933 appropriations which will be covered into said appropriations; and $32,450.71 is available for expenditures on account of the U. S. Shipping Board for the period of July 1, 1933, to Aug. 9, 1933, inclusive.

Gross appropriations and allotments from inception to July 1, 1935

Item	Original appropriation	Returned to U. S. Treasury surplus or reappropriated	Net appropriation	U. S. Shipping Board and U. S. Shipping Board Bureau	U. S. Shipping Board Merchant Fleet Corporation
For fiscal years ended prior to July 1, 1934:					
U. S. Shipping Board and U. S. Shipping Board Bureau:					
Acts of Sept. 7, 1916; June 12, 1917; July 1, 1918; July 19, 1919; June 5, 1920; Mar 4, 1921; June 16, 1921; June 12, 1922; Feb. 13, 1923; June 7, 1924; Mar. 3, 1925; Apr. 22, 1926; Feb 11, 1927; May 16, 1928; Feb. 20, 1929; Apr. 19, 1930; Feb. 23, 1931; June 30, 1932, and June 16, 1933	$42, 572, 116. 41	$797, 314. 28	$41, 774, 802. 13	$41, 774, 802. 13	
U. S. Shipping Board Merchant Fleet Corporation:					
Act of Sept. 7, 1916, permanent fund	50, 000, 000. 00		50, 000, 000. 00		
Acts of June 15, 1917, to June 12, 1922, emergency shipping fund	3, 363, 553, 000 00	37, 689, 497. 61	3, 325, 863, 502. 39		
Acts of Feb. 13, 1923; June 7, 1924, Mar. 3, 1925; Apr. 22, 1926, Feb. 11, 1927; May 16, 1928; Feb. 20, 1929; Apr. 19, 1930; Feb. 23, 1931, June 30, 1932, current maintenance and operations	167, 354, 250. 00	367. 70	167, 353, 882. 30		
Act of June 12, 1922, claims, damage charges, and miscellaneous adjustments	50, 000, 000. 00	11, 745, 815. 10	38, 254, 184 90		
Acts of Apr. 17, 1917, and July 1, 1918, national security and defense (Presidential allotments)	29, 512, 426. 27	4, 524, 107. 72	24, 988, 318. 55		
Acts of Apr. 22, 1926; Feb. 11, 1927; May 16, 1928; Feb. 20, 1929; Apr. 9, 1930; Feb. 23, 1931; June 30, 1932, and June 16, 1933, operation of trade lines, ex-purchasers (expenditures on approval of the President of the United States)	45, 000, 000. 00	45, 000, 000. 00			
Returned to the U. S. Treasury as required by act of Congress, June 30, 1932 (Public bill 212, 72d Cong.), Sec. 306 (*f*) and (*h*) exclusive of salary impoundments		2, 138, 240. 00	[1] 2, 138, 240. 00		
Total U. S Shipping Board Merchant Fleet Corporation	3, 705, 419, 676. 27	101, 098, 028. 13	3, 604, 321, 648. 14		$3, 604, 321, 648. 14
Total for fiscal years prior to July 1, 1934	3, 747, 991, 792. 68	101, 895, 342. 41	3, 646, 096, 450. 27		
For fiscal year ending June 30, 1935					
U. S. Shipping Board Bureau.					
Act of Apr. 7, 1934. Salaries and expenses	219, 216. 00		219, 216. 00		
Act of Aug. 12, 1935, and transfer and counter warrant no. 65: Salaries and expenses	33. 00		33. 00		
Act of Mar. 27, 1935 Salaries and expenses	175 00		175. 00		
Total for U. S. Shipping Board Bureau	219, 424. 00		219, 424. 00	219, 424. 00	

[1] Loss.

Gross appropriations and allotments from inception to July 1, 1935—Continued

Item	Original appropriation	Returned to U. S. Treasury surplus or reappropriated	Net appropriation	U. S. Shipping Board and U. S. Shipping Board Bureau	U. S. Shipping Board Merchant Fleet Corporation
For fiscal year ending June 30—Continued					
U. S. Shipping Board Merchant Fleet Corporation:					
Act of Apr. 7, 1934. Operation of trade lines, ex-purchasers (expenditures on approval of the President of the United States)	$5,000,000.00	$5,000,000.00			
Total for U. S. Shipping Board Merchant Fleet Corporation	5,000,000.00	5,000,000.00			
Total for fiscal year ending June 30, 1935	5,219,424.00	5,000,000.00	$219,424.00		
For fiscal year ending June 30, 1936:					
U. S. Shipping Board Bureau:					
Act of Mar. 22, 1935 Salaries and expenses	211,000.00		211,000.00		
Total for U. S. Shipping Board Bureau	211,000.00		211,000.00	$211,000.00	
U. S. Shipping Board Merchant Fleet Corporation:					
Act of Mar. 22, 1935: Operation of trade lines, ex-purchasers (expenditures on approval of the President of the United States)	5,000,000.00		5,000,000.00		
Total for U. S Shipping Board Merchant Fleet Corporation	5,000,000.00		5,000,000.00		$5,000,000.00
Total for fiscal year ending June 30, 1936	5,211,000.00		5,211,000.00		
Gross appropriations and allotments	3,758,422,216.68	106,895,342.41	3,651,526,874.27	42,205,226.13	3,609,321,648.14

Estimated operating profit or loss, fiscal year 1935

[Amounts shown in italic represent losses]

Item	Number of terminations	Estimated revenue	Estimated voyage expense	Insurance	Total expense	Profit or loss
Freighters	169		$1,380,828.60		$1,380,828.60	*$1,380,828.60*
Chartered vessels	[1] 1	$14,592.50		$6,718.14	6,718.14	7,874.36
	170	14,592.50	1,380,828.60	6,718.14	1,387,546.74	*1,372,954.24*
Inactive vessels:						
In custody of operations, Merchant Fleet Corporation	[1] 8				6,210.82	*6,210.82*
In custody of managing operator	[1] 8				43,127.14	*43,127.14*
Administrative expense operations					483,043.89	*483,043.89*
Miscellaneous revenue and expense		761,240.79			380,881.32	380,359.47
Total operations	186	775,833.29			2,300,809.91	*1,524,976.62*
Administrative expense, employees assigned to U. S. Shipping Board Bureau					173,154.34	*173,154.34*
Total					2,473,964.25	*1,698,130.96*

[1] Number of vessels at end of fiscal year.