

Monthly Review

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REVIEW OF BUSINESS CONDITIONS

IN SEPTEMBER, the Federal Reserve index of industrial production in the United States was at a level 192 percent of the 1935-39 average, as compared with 191 in August. The October figure was 195, which slightly exceeded the previous postwar peak of 194 reached in February. United States employment fell only slightly from September to October, remaining above the 60-million level and nearly a million higher than last year, although it was about 5 million below the July peak. In the Twelfth District, manufacturing employment reached a peak for the year in October. In California, total manufacturing employment was at a record peacetime October level, exceeding October 1947 by 4 percent. By late November the two major strikes in the District—the waterfront employees and the oil refinery workers—appeared to have been settled, with most oil refinery workers already back at work, and the waterfront employees expected to return by early December. Preliminary estimates indicated that for the first time since 1942, the peak seasonal employment of farm workers in California occurred in October rather than in September. This is attributed mainly to the record cotton harvest, a large tomato crop, and a late season in other fall crops.

However, over-all employment in California declined during the month ending October 15. This was partially explained by the effects of the maritime strikes on such related industries as transportation, services, and construction. Employment in retail trade also declined as sales began to fall off.

Lumber activity slowed

Several factors have affected the Pacific Coast lumber industry adversely in recent months. The shipping strike which started early in September has virtually halted all water shipments, both intercoastal and overseas. Rail shipments have increased as a result, but they have been impeded by a shortage of freight cars. In addition, demand for lumber has slackened, causing price declines in the lower grades. The decline in the number of housing starts during the past several months is no doubt an important factor contributing to decreased demand for lumber.

Production has been declining since the middle of the summer in the Douglas Fir area and rising somewhat in the Western Pine area. At the same time, and contrary to the situation in earlier months this year, shipments and

orders have been running below production since early June in the Western Pine area and since late July in the Douglas Fir area. The demand for clear lumber is still quite strong relative to the supply, but lower grades, which are more abundant, have been more difficult to sell and prices on these grades, particularly in Douglas fir, have dropped significantly. At present, mill stocks of lumber, although increasing during recent months, are low as compared with prewar averages. Stocks of lumber in distribution channels are also reported to be relatively low, but distribution and retail yards, confronted with slackening activity, are not ordering to build up their stocks.

Many mills are reported to have large supplies of logs on hand. This will tend to sustain production for a limited period of time in the face of declining demand. The mills will continue to cut lumber in order to avoid the spoilage that accompanies too long storage of logs.

Department store sales decline after August peak

The dollar volume of sales (adjusted for seasonal variation) in Twelfth District department stores dropped in September from the all-time peak reached in August to a level lower than in any month since March, 1948. A preliminary estimate indicates that a further and more severe slump occurred in October. Weekly sales figures show a decidedly lower volume of sales made in October and the first two weeks of November than in the corresponding period of 1947. Although these decreases first became apparent in the Twelfth District, a similar trend soon became evident in other western Districts, and in the first two weeks in November, all Districts in the country experienced a smaller volume of department store sales than in the corresponding period a year ago. Contrary to the decrease in sales, stocks held by District department stores on September 30, after adjustment for seasonal forces, were 3 percent above those of the previ-

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ous month and 14 percent above those held on September 30, 1947. Orders outstanding increased only slightly from August to September, and remained considerably below those of September 1947.

Consumers' price index declines slightly in October

The consumers' price index of the Bureau of Labor Statistics moved horizontally instead of upwards, for a change, in September. In October it actually fell very slightly. This is a reflection of earlier developments in primary markets. Price declines of wheat and corn have been more or less steady since the first estimates of the current record crops were made in late January and early February. Declining feed prices and the beginning of a more than seasonal increase in livestock marketings led to a weakening in hog and steer prices in July and August. Prices of metals, on the contrary, have increased sharply in recent months, and prices of copper, lead, and zinc are now at record levels. The increases in metals and metal products prices did not quite offset the declines in prices of farm products and foods with the result that the Bureau's index of wholesale prices declined nearly 3 percent from August to October.

The leveling off in September and the decline in October of the consumers' price index are attributable to declines in retail food prices. In the Twelfth District, Los Angeles was the only major city in which food prices rose from September to October. This was due mainly to a 6-percent rise in the price of eggs and a 5-percent rise in the prices of fruits and vegetables. The index of all commodities for that city rose by the same amount as did the index for food prices—0.5 percent. In the four other District cities for which the Bureau of Labor Statistics reports price developments, food prices declined from September to October. In Seattle, Portland, and Salt Lake City, the food price index fell 1.6 percent, and in San Francisco it fell 0.5 percent. These declines were due to price drops in meat, poultry, fish, and dairy products. In Portland, the only District city in addition to Los Angeles for which a more complete report was issued for October, the index for all commodities fell 0.1 percent.

Expansion in bank loans

The marked expansion in Twelfth District bank loans that occurred in August and September was retarded in October and early November. In the two weeks which ended November 17, however, the rate of expansion increased again. Most of the change occurred in commercial, industrial, and agricultural loans. The growth in real estate loans, which lagged in July and August, picked up significantly in the following two months, but was still running at a rate substantially below the average for the first six months of this year.

In the country as a whole, total loans of weekly reporting member banks declined for the first time in six months during October. The decline was due solely, however, to a decrease in loans for purchasing and carrying securities and in loans to banks. Both of these categories

had risen to relatively high levels toward the end of September when member banks had to meet increased reserve requirements. Many of these loans were paid off during October, but other major categories of loans continued to increase.

Deposit growth less this year

Member bank deposits have failed to grow as rapidly relative to loans in the third quarter of this year as they did in the corresponding period a year ago. This was true in both the Twelfth District and the United States, as the following table indicates:

	Twelfth District		United States	
	Amount (in millions)	Percent	Amount (in millions)	Percent
Third quarter 1947				
Deposits increased	\$470	3.0	\$2,190	1.9
Loans increased	340	7.3	1,640	5.7
Third quarter 1948				
Deposits increased	110	0.7	890	0.8
Loans increased	260	4.6	1,580	4.7

Some concern has been expressed that the failure of District deposits to show their usual autumn growth this year signifies a lack of the normal inflow of deposits from outside the District. An examination of the situation reveals, however, that this development may be explained largely in terms of the impact upon deposits of the retirement of a relatively large amount of bank-held debt in the third quarter of this year. While figures are not available for the Twelfth District, estimates prepared by the Board of Governors of the Federal Reserve System, and shown in the accompanying table, indicate that for the United States the amount of bank-held public debt retired in the third quarter of this year was much larger than in the same quarter of 1947.

	Third quarter	
	1947	1948
(in billions)		
Cash retirement of marketable United States Government securities held by:		
Federal Reserve banks .....	...	\$1.1
Commercial banks	\$.1	.5
Total bank-held .....	.1	1.6
Other investors .....	.6	.4
Total	\$.7	\$2.0

The retirement of marketable debt during 1948 has been accomplished through the use of tax receipts and of funds obtained by the sale of nonmarketable public debt to nonbank investors rather than through a reduction in preexisting Treasury balances. The payment of taxes or the purchase of Government securities by nonbank investors reduces privately-held bank deposits and increases Treasury deposits. These deposits are extinguished when they are used by the Treasury to retire bank-held debt since, in fact, the Treasury and banking system exchange liabilities; that is, deposit liabilities of banks are exchanged for security liabilities of the Treasury. Consequently, the retirement of bank-held debt out of tax receipts, or out of funds obtained by the sale of nonmarketable securities to nonbank investors, reduces the amount of bank deposits.

WESTERN POWER AND FUEL OUTLOOK—I. ELECTRIC POWER

IN common with many other parts of the country, the Twelfth District has experienced more or less serious deficits of electric power during the past two years and has also found itself somewhat pinched for such industrial fuels as petroleum and natural gas. These shortages and the consequent necessity to impose restrictions on the use of electric power and gas, notably in California, have raised some question as to the adequacy of regional power and fuel supplies to sustain the industrial growth of the area. It is proposed to examine this general problem of the fuel and energy situation in the West in a series of articles in the *Monthly Review*. An attempt will be made to appraise the current position and probable future outlook for each of the three major sources of industrial energy available in the District—petroleum, natural gas, and electric power. Because public experience with power shortages has attracted more general attention, it will be advantageous to consider the electric power situation first.

Changing conditions of fuel and energy supply in the West

Until comparatively recent years it was commonly taken for granted that the power and fuel resources of the West were practically inexhaustible. The existence of numerous undeveloped water power sites, in particular, has frequently been stressed as one among many arguments for the industrialization of the West. Although high-grade coal is lacking or is difficult of access in most states of the Twelfth District except Utah, the availability of large resources of petroleum and natural gas was confidently counted on to supplement hydro-electric sources of energy. Cheap power and fuel were definitely reckoned as among the permanent assets of the Western economy.

Since the war, however, a new situation has arisen and the aggregate demand for industrial energy and fuels threatens, at least temporarily, to outrun supply. The extremely rapid population growth of many District areas during and since the war, together with the general expansion and diversification of industry and the increasing mechanization of farm and factory operations, has caused a large per capita increase in energy requirements of all kinds. Following a brief recession at the end of the war, the demand for electric power in most parts of the District increased much more rapidly in 1946 and 1947 than the expansion of generating and transmission facilities. The phenomenal growth of demand for practically all types of petroleum products is placing a severe strain upon the petroleum industry of the West. It seems probable that the traditional export surplus of California's oil fields and refineries, which supply the bulk of the petroleum products used in the western states and which formerly shipped large quantities of crude and refined oils to eastern and foreign markets, may soon give way to a net import movement. Even the once apparently unlimited supplies of natural gas in California have proved inadequate in recent years to meet total demands and the state is already importing large quantities of this fuel from western Texas in order to conserve its own reserves as much as possible.

Recent Power Shortages

Shrinking margins of generating capacity over load requirements characterized the electric utility industry in most parts of the District during almost the entire period from the last quarter of 1945 to the second quarter of 1948. This deterioration in the ability of the industry to meet its customers' needs was due in part to the unexpectedly rapid growth in demand for power following the reconversion of war industries and in part to the difficulties encountered in securing new electrical equipment from the manufacturers. Because of this situation, which was aggravated by extraordinary weather conditions during the past two seasons, some parts of the District experienced shortages of electric power which necessitated more or less drastic curtailments in service.

The California situation

In California some restriction of service to industrial customers supplied with "surplus" power at low rates became necessary in the summer of 1947. The 1946-47 season was marked by a serious deficiency in rainfall which resulted in low stream flow and generally reduced output of hydro-electric energy. Steam plants were called upon more heavily in 1947 and provided a much larger proportion than usual of the total energy output of the state. Even so, the total power supply proved inadequate and a group of chemical plants in the San Francisco Bay area, which were beneficiaries of low rates for power sold on an interruptible basis, were cut back for several months to about 50 percent of normal operation.

The power shortage of 1947 in central California continued into the first quarter of 1948 and was intensified by a second season of deficient rainfall, which also affected parts of Arizona and Nevada. Arizona, in fact, has experienced several successive years of water and power shortage. Up to about the middle of last March, the deficiency in seasonal precipitation over much of this area was almost the worst on record and resulted in serious damage to crops and pastures. Coming on top of the scanty supplies of 1947, the prolonged drought further reduced the effective generating capacity of many hydro-electric plants and threw a still heavier burden on steam plant operations. The demand for power for irrigation pumping reached levels in the early months of 1948 that are usually attained only during July or August. This abnormal irrigation demand was superimposed upon a steadily growing industrial and domestic load, the total effect of which carried the output of electric energy in California in the first three months of the year to a level nearly ten percent above that of the same period of 1947.

The 1948 curtailment program

Faced with these extraordinary increases in demand and hampered by lagging hydro-electric output, the principal electric utility concern in Northern California instituted a voluntary curtailment program in February among its customers and affiliated distributing companies. These measures proved ineffective, however, and were

superseded in March by orders of the California Public Utilities Commission designed to enforce a general 20 percent reduction in power consumption in the northern and central areas of the state. The use of electricity was drastically curtailed for most classes of users and for certain non-essential purposes was prohibited; the installation of new connections was also greatly restricted. Southern California, while affected by the drought and consequent reduction of hydro-electric energy, except from the Colorado River, had a larger margin of steam plant capacity and did not experience a general power shortage. Hence no compulsory restrictions were placed on power use in that area. By act of the legislature, statewide daylight saving time was adopted March 14 as a power conservation measure. This expedient was expected to save about 235 million kilowatt hours of energy, or roughly 9 percent of the estimated power deficiency during the remainder of the year.

Fortunately, a period of heavy precipitation set in late in March and continued for several weeks, substantially increasing the snow pack and the volume of water in storage reservoirs and also reducing the rate of irrigation pumping. Together with the timely installation of additional generating capacity in Northern California and the transfer of some 200,000 kilowatts of power from the southern part of the state, the ending of the drought permitted the lifting in April of the restrictions on power use which had been imposed a month earlier. Statewide daylight-saving was retained, however, as a safeguard against excessive drains on the still somewhat precarious power supply.

Reversing the trend of the first quarter of the year, total electric power consumption in California fell during the second quarter of 1948 to about the levels of the corresponding period of 1947. Beginning with July, however, new high records were again established. Both privately- and publicly-owned utility systems have energetically pushed the installation of new generating facilities, transmission lines, and transformer stations. In spite of continuing growth in total demand, peak loads have so far been taken care of, though with a scanty margin of reserve capacity. The situation has been under constant review by the industry Power Interchange Committee and by the Public Utilities Commission which have counselled the retention of daylight-saving time until the next major additions to the area's generating facilities are ready for operation, which is expected to be in December and January.

The Pacific Northwest

While perhaps attracting less attention than the California experience, the Pacific Northwest is facing a probably more critical power problem than any comparable area in the West. This situation has arisen primarily from the rapid development of the electro-metallurgical industry in that region and from the large prospective demand on the power supply to be expected from the requirements for irrigation pumping as the huge acreage of the Columbia Basin project is gradually brought under cultivation. The demands of the defense industries during

the next year or two will probably also put additional pressure on the power supplies of the area.

Growing concern is being voiced in the Pacific Northwest over the narrow margin of available power reserves over demand. In a statement issued in January 1948, spokesmen for the leading privately-owned electric utilities and city systems of the area pointed out that the power requirements of the Pacific Northwest already exceed the safe operating capacity of the generating facilities of the region. This statement emphasized the need for additional Federally-owned generating capacity if the future industrial development of the area is not to be retarded. In fact, plans for the establishment of new factories in the lower Columbia River basin have had to be dropped or indefinitely postponed because the available supply of firm electric power in that region is barely sufficient for the needs of already existing plants.

This situation in the Pacific Northwest was characterized by the tenth annual report of the Bonneville Power Authority, issued in December 1947, as "a far cry" from the conditions of ten years ago when the great dams on the Columbia River with their enormous electric power potential were regarded by many as "white elephants" for whose output no regional market could be developed. The problem at that time—one of finding markets—has given way to the problem of developing power output rapidly enough to keep up with the growth of demand. The temporary loss of heavy industrial power loads following shutdowns in the major war industries in the early postwar period was quickly made up as industry converted to a peacetime basis. The subsequent increase in demand from all sources—industrial, commercial, domestic, and rural—has absorbed the entire regional productive capacity of electric energy. Both the Bonneville Power Administration and the public and private utility managers agree that even if presently approved Federal power projects in the Pacific Northwest are completed as rapidly as is physically possible, the generating capacity of the region will not catch up with expected power requirements until at least 1954.

Postwar demand for electric power has, if possible, been even more insistent in the Pacific Northwest than in California, while the limitations upon expansion of generating capacity have operated more severely in that area. Few significant additions to generating facilities have, in fact, been made in recent years by the privately owned utility systems of the Northwest. Although the Bonneville Power Authority has added three large generators to its Grand Coulee plant, it had to relinquish in 1946 the two 75,000 kilowatt units which had been diverted in 1943 from the Shasta plant of the Central Valley Project. On balance, the total installed capacity in Washington, Oregon, and northern Idaho increased about 10 percent during the period from January 1946 to June 1948; nine-tenths of the net gain was accounted for by the installations at Grand Coulee, which has now been developed to one-half its ultimate capacity.

One of the drawbacks connected with the growing dependence of the whole northwestern regional power

supply upon the facilities of the Bonneville Power Administration is the fact that the individual generators of this system are very large units, ranging in size from 50,000 to 108,000 kilowatts, each. When it is necessary to make periodic overhaul or emergency repairs to one of these units the resulting reduction in power output is correspondingly large.

The aluminum industry and industrial power curtailment

The heavy draft on the power supplies of the Pacific Northwest made by the war-created metallurgical and chemical industries is probably not generally realized outside that region. The aluminum reduction plants, in particular, require huge quantities of electric energy, which the opportune installation of the publicly owned facilities at Bonneville and Grand Coulee in the early war years fortunately made available. Except during the fiscal year 1945-46, when some of these plants were closed down, the aluminum industry has taken well over half the energy output of the entire Bonneville system and currently represents from one-quarter to one-third of the total power load of the aggregate utility system, public and private, in Oregon and Washington.

Due to its concentration in a small group of highly mechanized plants, which employ a relatively small labor force and hence present only a minor employment problem, the aluminum reduction industry of the Pacific Northwest offers a ready opportunity for the adjustment of industrial power use to seasonal fluctuations in total demand and output. Seasonal variations in demand are not so pronounced in the Pacific Northwest as in the California-Arizona-Nevada area, chiefly because of the lack of a heavy irrigation load in the summer months. Stream flow is also generally more uniform and dependable and much less use is made of auxiliary steam power. Fluctuations in total demand in the Pacific Northwest are associated primarily with the varying needs of domestic and commercial customers for lighting and heating. These users, generally speaking, pay the highest rates and must be served first. The large industrial users obtain a significant part of their total power requirements at very low rates for "surplus" power sold on interruptible schedules which permit their service to be cut to the extent necessary to assure a firm supply to the high rate users.

Both in 1947 and 1948 the Bonneville Power Administration has required the aluminum plants to reduce their power consumption during the hours of peak load in the winter months, when the maximum demand occurs. Last year, unusually favorable weather conditions enabled the power agencies of the area to meet their energy requirements with a minimum of curtailment, though with a very narrow margin of reserve capacity. This year, in spite of increased generating capacity, the period of shortage has come earlier than usual; estimates of the extent of curtailment by the Bonneville Power Administration necessary to insure the maintenance of essential service run to approximately 150,000 kilowatts, or about 8 percent of the system's peak capacity.

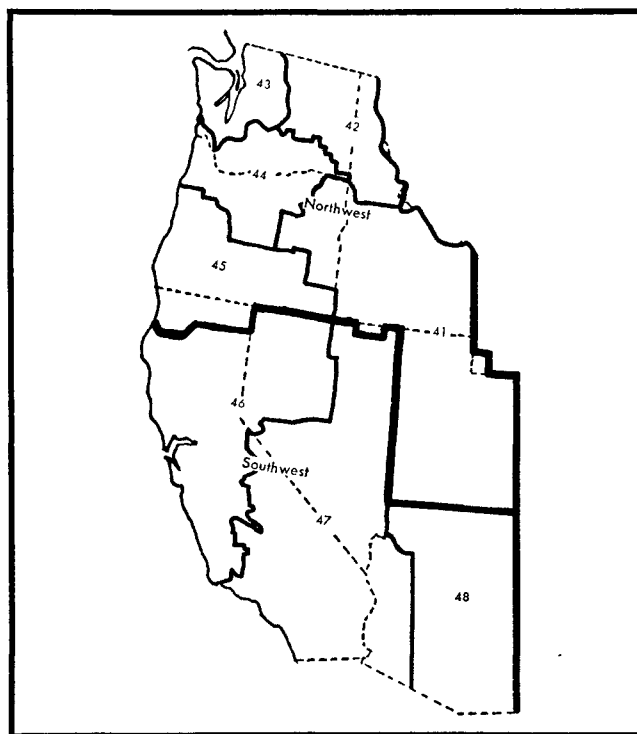
Generating Capacity vs. Demand

The electric power supply-demand situation in the Twelfth District is summarized in the following data reported by the Federal Power Commission. The table indicates the rated generating capacity of the electric public utilities, including municipal systems and Federal projects, at June 30, 1948, and gives the most recent available figures for peak loads in the various power supply areas of the District, as defined by the Federal Power Commission. (See map.)

Power supply area	Installed capacity (kilowatts) June 30, 1948	Peak loads (kilowatts) Aug., 1948
41—Utah, Southern Idaho, Eastern Oregon...	359,100	367,800
42 & 44—Northern Idaho, Eastern & Southern Washington, Northern Oregon	2,034,000	1,839,100
43—Northwestern Washington	802,400	839,200
45—Southern Oregon, Northern California.....	150,600	228,000
Northwest	3,346,100	3,274,100
46—Central California, Northwestern Nevada..	1,808,900	2,137,500
47—Southern California, Eastern & Southern Nevada, Western Arizona	2,922,600	2,263,500
48—Eastern Arizona	168,500	300,000
Southwest	4,900,000	4,701,000
All District areas	8,246,100	7,975,100

Source: Federal Power Commission, *Electric Utility System Loads*.

ELECTRIC POWER SUPPLY AREAS—TWELFTH DISTRICT



Source: Federal Power Commission. The Commission also includes Montana in the Northwest region. The figures in the table, however, exclude Montana, which is not a Twelfth District State.

Lagging installations in early postwar period

The basic factors underlying recent shortages of electric power in the West are much the same as those operating generally throughout the country. Fundamental in the whole situation was the enforced suspension of all

except the most necessary installations of generating equipment during the war. Only the projects considered vital to the national defense effort were sanctioned, while the facilities of the electrical equipment manufacturers were largely concentrated on supplying the needs of the armed forces, particularly the construction of generators for naval and merchant vessels. The West fared considerably better in this respect, however, than the country as a whole, for it was during this period that most of the generating capacity of the Columbia River projects and about one quarter of that at Boulder Canyon were installed. Largely as a result of these new facilities, the output of electric energy in the District more than doubled within the five years between 1939 and 1944, the peak year of the war. Nonetheless, wartime restrictions on construction of plant and equipment held back much of the expansion in generating and transmission facilities that would normally have occurred and some for which commitments had actually been made. The northern and central California areas were perhaps more affected by these delays and postponements than other parts of the District.

For the first two years following the end of the war relatively little progress could be made in most parts of the country, including the Twelfth District, in making up these war-induced delays in the installation of badly needed generating capacity. Material and manpower shortages, together with strikes in the plants of the electrical supply manufacturers, were chiefly responsible for delaying the delivery dates of new equipment. Because of the lagging delivery of new equipment, and the removal from the Grand Coulee power house of two large generators borrowed from the Shasta plant, there was an actual loss in total installed generating capacity in the District in 1946. A small increase occurred in 1947, amounting to about 330,000 kilowatts, or less than five percent, most of which was concentrated in the Columbia River and Southern California areas. Meanwhile the demand for power continued to grow at a phenomenal rate, especially since about mid-1946, and the margin of reserve capacity in most parts of the District was rapidly reduced. The aggregate peak load of power demand at the end of 1946 represented about 95 percent of rated plant capacity for the District as a whole and had increased to over 102 percent by the end of 1947. This overload completely wiped out any over-all margin of reserve capacity to insure against physical breakdowns in generating or transmission equipment, or other emergencies, such as the unusual demands arising from the 1948 drought in California and Arizona. Only through extensive interconnection and integration of facilities between various parts of the District was a more serious situation averted.

Within the District considerable differences have marked the various power supply areas with respect to available reserves and overloads. During the past year the Southern California-Nevada-Arizona area has enjoyed the widest margin between installed capacity and power loads, although here the reserve was none too large

—around ten percent at the end of 1947. The Columbia River and Idaho-Utah areas rated next in order of reserve facilities, but by very narrow margins. At the other extreme, peak loads have exceeded rated generating capacity in the Central and Northern California, Southern Oregon, and Puget Sound areas and more recently in Eastern Arizona. The deficiency areas have become increasingly dependent upon other parts of the District and, to some extent, upon areas outside the District in meeting their power requirements.

Outlook for the next few years

Taking a somewhat longer view of the situation, the outlook for the next few years appears more promising, although it is admittedly difficult to anticipate the demand-supply situation very far in advance. Reliable forecasts of power requirements are not available for the District as a whole, although reasonably comprehensive estimates for the Pacific Northwest are prepared each year by the Bonneville Power Administration. On the supply side somewhat more definite, though still incomplete, data are available from the reports made by the utility systems to the Federal Power Commission indicating their scheduled additions to installed generating capacity for a period of three or four years in advance.

The most recently published official data on electric utility generating capacity in the Twelfth District, with scheduled additions for the years 1948-51, as reported by the Federal Power Commission, are summarized as follows:

	Twelfth District areas (thousand kilowatts)	United States
Installed capacity, June 30, 1948	8,246	50,933
Scheduled additions:		
July-Dec. 1948	529	3,044
1949	782	5,158
1950	915	4,474
1951	505	2,869
Total, July 1948-Dec. 1951	2,731	15,545
Indicated capacity, Dec. 31, 1951	10,977	66,478
Percent increase, 1948-1951	33.1	30.5

These forecasts, made prior to June 1948, somewhat understate the probable expansion of electric generating capacity to be expected in the District during the next few years, as not all plans are promptly reported. According to later information obtained from the San Francisco regional office of the Federal Power Commission, the above estimates may be raised by about 880,000 kilowatts, or roughly 25 percent, nearly nine-tenths of which is scheduled for 1950 and 1951. Among these additions are two more generators of 108,000 kilowatts each for the Grand Coulee plant to be installed in 1951, in addition to six included above for installation in 1949-50, thus leaving only one more unit needed to complete this power plant by 1952. Also included in this revised estimate is the installation of 225,000 kilowatts capacity at the new Davis Dam project of the United States Reclamation Bureau on the Colorado River, near Kingman, Arizona, in 1950-51.

Water Power vs. Fuel Plants

As compared with most parts of the country, water power plays a relatively large part in the electric energy supply of the West. For the United States as a whole, from three-fourths to four-fifths of all electric power is fuel based, while in the Twelfth District the proportions are normally reversed. In 1946, in fact, hydro-electric plants supplied over 85 percent of the total District output. Except in California and Utah, fuel is scarce and relatively costly in most parts of the District. Climatic and topographic conditions over much of the region assure fairly dependable stream flow, at least when supplemented by dams and reservoirs, which in some locations provide extraordinary heads of falling water. Although distances from power sites to centers of industry and population are sometimes considerable, transmission losses are not usually excessive and water power has contributed notably to the generally low level of rates for electric energy prevailing in most parts of the District.

Until within recent years the role of fuel-based power in the West has largely been to supplement hydro-electric output by assuring firm supplies of energy at the seasons of heaviest demand, or in some cases at the period of relatively low stream flow and uncertain production by water-driven plants. In certain areas, more especially in the larger urban centers, steam plants are operated fairly continuously at somewhere near their full potential; in other areas they are chiefly in the nature of standby capacity, to be drawn upon principally at the low stage of the water power cycle. On the average, the heaviest use of fuel-operated plants in the District as a whole comes in the fall and early winter months, the lightest use in late winter and early spring. They provide the necessary element of flexibility which otherwise would be lacking in the power supply of the District.

California and the Southwest

Indications are beginning to multiply, however, that fuel-based energy is destined to play an increasingly important part in the electric power supplies of this region, especially in California. The better and more accessible water power sites for single purpose hydro-electric plants have mostly been put to use and the poorer or more distant sites will require relatively heavy capital investment to develop their possibilities and will also involve greater line losses in long distance transmission. On the other hand, it may be expected that a relatively large volume of hydro-electric power will continue to be developed, more or less as a by-product, in connection with multiple purpose projects for irrigation, municipal water supply, flood control, etc. A limited number of sites are available on the lower Colorado River where the development of hydro-electric energy is economically feasible and which are within practical transmission distance of power consuming centers. Recent estimates by the Federal Power Commission's regional office at San Francisco indicate, for example, that five projects currently being considered for development by the Federal Government in California and two others on the Colorado River within economic

transmission distance to southern California and Arizona markets, would provide an initial dependable capacity of some 1,600,000 to 1,700,000 kilowatts—an amount equal to about one-third of the existing installed capacity in the three-state area, California-Arizona-Nevada. Most of these projects are very large scale affairs, however, and require correspondingly large financial resources, which only the Federal Government is able to supply. Their development would also require considerable time.

Meanwhile the insistent demand for power is increasingly being supplied in the California-Arizona-Nevada area by steam plants. The proportion of the total electric energy produced from fuel by public utilities and industrial establishments in these three states for successive periods from 1930 to 1947 was as follows:

1930-34 average	23.9 percent
1935-39	“ 13.7 “
1940-45	“ 15.1 “
1946-47	“ 33.3 “

In California, the proportion of fuel-based electric energy in 1947, a year of deficient water power, rose to nearly 45 percent of the total electric output. Of the new utility generating capacity scheduled for installation in the three-state area in the period 1948-1950, over 60 percent is to be served by fuel plants, less than 40 percent by hydro-driven plants; in Southern California the proportion for new fuel plants runs close to 75 percent. Informed opinion in the industry points to the probability that in California fuel-based electric energy will within the next 20 years come to exceed that from hydro-electric plants.

The Pacific Northwest

Fuel-based electric energy is much less important in the electric power supply of the Pacific Northwest than in other parts of the District. Over the period from 1930 to 1947 the proportion of the total electric power supply of Oregon and Washington produced by fuel plants has averaged only about 8 percent, declining from about 19 percent in 1930 to 2 percent in 1945. California oil and small quantities of Utah coal are used by steam plants in the Northwest, chiefly in the larger cities. The growing scarcity and rising costs of these fuels have added to the problems of local power supply during the past two seasons.

Well over half the total electric power supply of the Pacific Northwest has in recent years been produced by the hydro-electric generators of the Government-owned Columbia River system. The extensive program of further development of the Columbia River Basin to which the Federal Government is committed, together with the surplus power available from new large-scale irrigation projects in the area, promises to maintain a relatively high proportion of water power in the total energy supplies of the region. Presently approved plans call for the construction of new dams and the installation of large generating capacities at various points along the Columbia, Willamette, and Snake Rivers and their trib-

utary streams, and for doubling the present capacity of the Grand Coulee powerhouse to an ultimate capacity of nearly 2,000,000 kilowatts.

Following a long period of relative quiescence, some of the privately-owned utilities in the Pacific Northwest are now making commitments for enlargement of generating facilities. New installations are also projected by some of the municipal systems. With one relatively small exception, all of these call for further water power development rather than fuel-based plants.

Some idea of the future electric power requirements of the Northwest visualized by the public power agencies of the region may be had from the following estimates of the Bonneville Power Administration covering the period from 1946 to 1960. These figures are for the area including Oregon, Washington, Idaho, and Western Montana.

	Total energy requirements (million kilowatt hours)	December peak (thousand kilowatts)
1946	16,378	3,157
1947	19,988	3,544
1948	22,472	4,233
1949	25,106	4,628
1950	27,356	5,065
1955	45,622	8,015
1960	76,476	11,840

Source: *Review Report on Columbia River and Tributaries*, Appendix N, Part 1, Power Markets and Developments in the Pacific Northwest, Corps of Engineers, Department of the Army, October 1, 1948, p. 55.

The problem of power costs

Whether water-based or fuel-based, the electric power supply of the future will probably be produced at higher unit costs than in the past. This is likely to necessitate the

charging of higher rates for electric energy unless a policy of public subsidization is adopted. Certainly the continuation of the tendency to turn to fuel-based energy as the major future source of supply in the California-Arizona-Nevada area, which is the present outstanding trend in the privately-owned sector of the utility industry, implies higher costs, particularly as oil and natural gas become scarcer and more costly.

Higher cost power in this region will mean a narrowing of the differential in power costs currently enjoyed by certain western industries as compared with similar industries in other parts of the country. This is not likely, however, to involve any marked competitive handicap, since in the great majority of instances power costs play a relatively small part in the total cost of production of western industries. Probably only in such cases as the electro-metallurgical and electro-chemical industries is the availability of large blocks of power at very low rates a vital factor in determining plant location. The dependence of the aluminum industry of the Pacific Northwest on the cheap power of the Columbia River is a case in point. Even here, however, in spite of the elaborate expansion program already authorized in that area, prospective power supplies are limited. It is significant in this connection that in planning for new plant expansion to meet anticipated future demands, one of the leading aluminum producers in the Northwest will construct its next plant in Texas, using natural gas to generate the necessary electric power, rather than wait for additional hydro-power in the Columbia River area.

THE STRUCTURE OF NONAGRICULTURAL EMPLOYMENT IN THE TWELFTH DISTRICT

"WHERE will all these people find jobs if they stay in the West?" was a common question during the war years, prompted by the extremely large increase in population and employment over prewar levels. People did stay and even more came, including many from the armed services. While many war workers retired from the labor force, most people looking for work have found jobs. Nonagricultural employment of wage and salary workers, which today includes more than 4.3 million persons (in the five District states for which comparable information is most readily available, Arizona, California, Nevada, Utah, and Washington), is virtually as high today as during the war and is over 70 percent higher than in 1939.¹ Even so, the distribution of workers among

major industry groups is now not markedly different than before the war. Little trace remains of the wartime pattern of employment among industry groups. Employment in manufacturing, however, is now somewhat differently distributed among individual industries than it was in 1939. Generally, employment in the heavier industries has tended to increase relative to the total.

Present employment compared with the war period

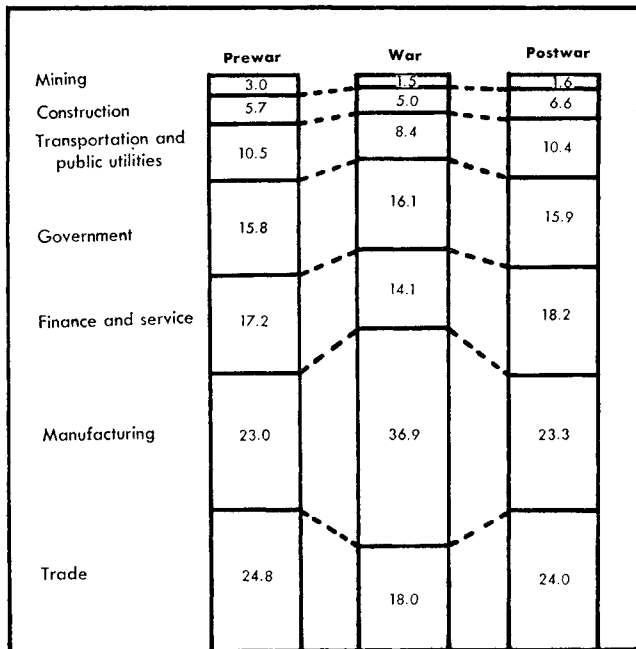
In August 1948, nonagricultural employment of wage and salary workers in the five District states under discussion was about one and a half percent less than in August 1943. If those who are self-employed (proprietors of unincorporated business) are considered, employment is actually higher now than during the war, despite a loss of 650,000 jobs in shipbuilding and aircraft alone. Some workers were absorbed in other manufacturing industries such as lumber, stone, clay, and glass, apparel, chemicals, and petroleum. Nevertheless, there are 600,000 fewer people left in manufacturing employment. The number of employees in factories accounted for over one-third of total nonagricultural employment in 1943 and accounts for less than one-fourth now.

The reduction in manufacturing employment since 1943 has been offset by an increase of 250,000 people in

¹The data used in this survey cover the months of October 1939, August 1943, and August 1948. October 1939 is the only prewar month for which figures covering both manufacturing and all nonagricultural employment are available, and August 1948 is the most recent month for which data are available. The use of different months introduces some, though not substantial, seasonal differences into the comparisons made. The greatest possibility of error is in food processing because of the canning season, but even here the results discussed are not appreciably affected. Numbers of persons employed by industry groups in 1943 and 1948 are not fully comparable with 1939 figures because of a somewhat different method of estimating employees in establishments with fewer than eight persons. The effect of this difference, however, on the comparison of percentages of total employment is not significant. August 1943 is the month of peak war employment in manufacturing and is only slightly below the total nonagricultural employment peak of September 1943.

Sources: For California, State Division of Labor Statistics and Research; for other states, United States Bureau of Labor Statistics and cooperating state agencies.

PERCENTAGE DISTRIBUTION OF NONAGRICULTURAL EMPLOYMENT BY MAJOR INDUSTRY GROUPS—TWELFTH DISTRICT¹ PREWAR, WAR, AND POSTWAR²



¹ Includes data for five states only—Arizona, California, Nevada, Utah, and Washington—comprising more than 65 percent of total nonagricultural employment in the District.

² Prewar data are for October 1939, war for August 1943, and postwar for August 1948.

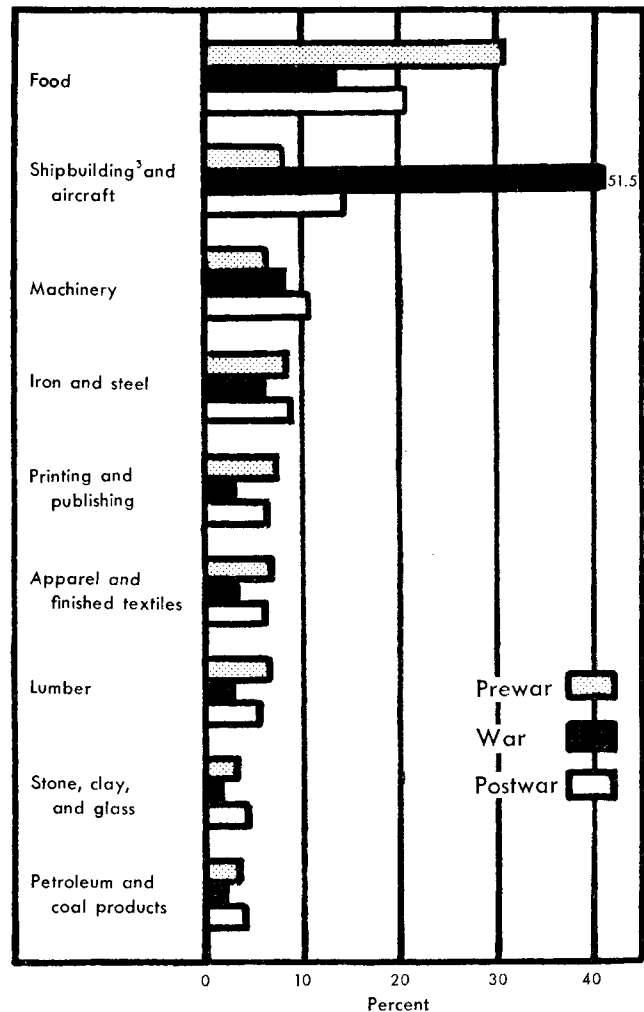
trade, 170,000 in finance and services, approximately 80,000 in transportation and public utilities, and about 70,000 in construction. The gains in these industries since the war reflect the removal of several factors dominating the employment picture during the war. Much higher wages in manufacturing, plus controls on manpower, restrictions on activities such as construction, and certain incentive appeals, made employment in wartime manufacturing more attractive and easier to obtain than in other fields. Furthermore, many persons entering the labor force lacked skills, and training programs were directed toward giving them skills suitable for war production. As a consequence, the labor supply on which trade, finance and services, and utilities could draw was limited.

Since a good many of the wartime entrants into the labor force were temporary, the end of the war witnessed an exit of older persons, housewives, and other temporary workers. Additions to the labor force were, in large measure, returning servicemen who were younger and had a greater variety of skills. The reduction in the demand for war goods and the removal of controls permitted the various service industries to reassert themselves in the market. At the same time, a rapidly increasing District population and income required a greater flow of services. An additional factor was the spread of the 40-hour, 5-day week which in some service industries replaced longer work weeks and made employment more attractive.

Current employment by industry group resembles prewar distribution

In the five states under discussion the distribution of workers among major industry groups is not very different now than in prewar periods. Mining is a pronounced exception; employment here has declined both in numbers and in its relation to total employment. Because of increased mining costs, the production of gold, for which the price is fixed, has become less profitable. Marginal mines and new explorations, therefore, have been abandoned for the present. Some gains have been made in the proportions accounted for by the construction and the finance and service groups. Construction has become more important because of the backlog of building needs and current demand, and finance and services have gained because of the expanded population and in-

PERCENTAGE DISTRIBUTION OF MANUFACTURING EMPLOYMENT BY INDUSTRY IN CALIFORNIA¹ PREWAR, WAR, AND POSTWAR²



¹ Industries having less than 4 percent of total manufacturing employment in August 1948 are omitted. Machinery employment includes electrical and nonelectrical machinery.

² Prewar data are for October 1939, war for August 1943, and postwar for August 1948.

³ During the war shipbuilding accounted for almost half the employment included in this group, but at present it accounts for only slightly more than 10 percent.

come. There has been little change in the proportion of workers in manufacturing. This is a reflection in part of the greater expansion of service employment because of population and income growth. Moreover, much of the increase in manufacturing production here over prewar levels has been associated with a greater proportion of expenditures on plant and equipment to total expenditures than before the war.

Employment in heavy industry more important now

Although manufacturing employment accounts for about the same proportion of total nonagricultural employment as in 1939, the heavier industries account for a higher proportion of manufacturing employment now than they did in 1939. In general, the durable goods industries have had a larger percentage increase in employment than the nondurable goods industries.

Conspicuous in this respect in California, which has

almost 80 percent of the manufacturing workers included in this study, are aircraft, iron and steel, stone, clay, and glass, and automobile assembly. Employment in petroleum refineries has also increased relative to the total. At the same time the raw material industries—lumber and food processing—and the consumer goods industries, such as apparel and furniture, employ a smaller part of the total than before the war.

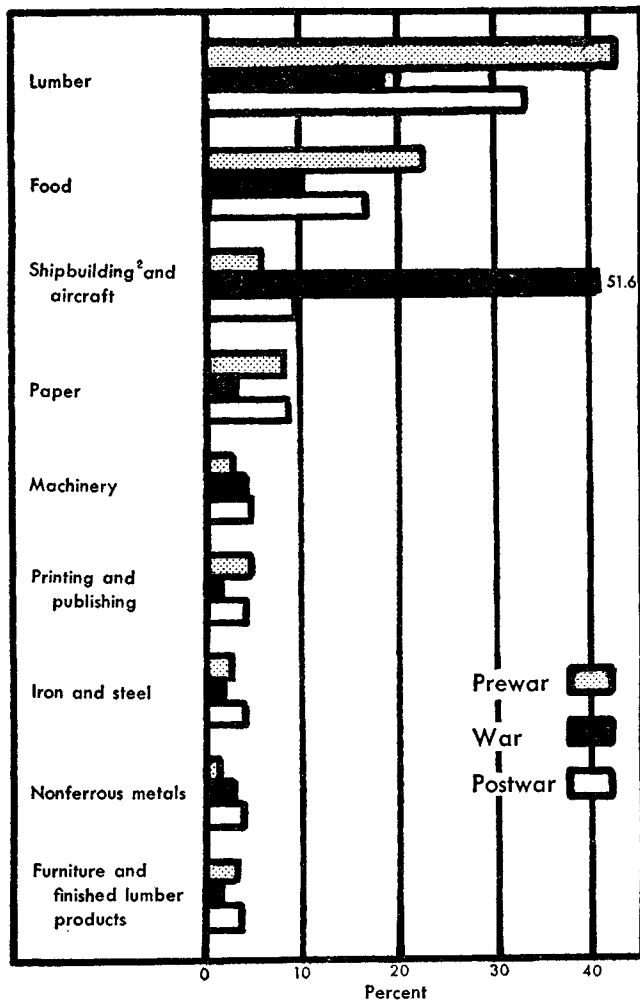
Washington, which accounts for 18 percent of the manufacturing employment in this study, shows a similar pattern to that of California. Here again, lumber and food processing have a reduced share of total employment in comparison with 1939. The significant gains in Washington have been made in aircraft, aluminum, machinery, and iron and steel.

The industries that have increased in relative importance are for the most part those which require a larger than average amount of capital per employee and per unit of output. Thus the District may be considered more industrialized than before the war, although manufacturing's share of total employment has not changed.

The effect of the war period has been to hasten the broadening of the industrial base of Twelfth District economic activity. Steel capacity and output have more than tripled. A substantial portion of the aluminum production of the entire country is centered in the Pacific Northwest. Aircraft activity is now many times greater than prewar, and aircraft production capacity (and also shipbuilding capacity) far exceeds production levels and would permit considerable expansion. The making of many different kinds of machinery, ranging from road-building equipment to small electric generators, has also expanded considerably since 1939. As a consequence the District is now somewhat less dependent on outside sources for industrial products than it was a decade ago. Substantial quantities of steel, machinery, manufactured parts and sub-assemblies, and other industrial goods, however, are still bought from other parts of the nation.

These developments generally characterize the transition of an agricultural and raw material economy to an industrial economy. A raw material economy will tend to have a large number of persons engaged in primary handling of the raw material. This has been and still is true in Washington. There the large employment in durable goods is chiefly the result of employment in the lumber industry. In addition, the food processing industry both in California and Washington is based on the agricultural production of these states. Increased industrial development is at first marked by an expansion of other consumer goods industries for local consumption as had been the case in prewar years in both states. A further stage in the development occurs when additional heavy industry is introduced to take advantage of previously unexploited resources, locational advantages, or increasing demand for such goods. This stage is evident in California and to a lesser extent in Washington. California, however, is entering the next phase in which more highly processed goods are also produced.

PERCENTAGE DISTRIBUTION OF MANUFACTURING EMPLOYMENT BY INDUSTRY IN WASHINGTON PREWAR, WAR, AND POSTWAR¹



¹Prewar data are for October 1939, war for August 1943, and postwar for August 1948.

²Though separate figures for shipbuilding and aircraft production are not available, shipbuilding probably does not contribute more than 10 percent of the employment in this group at present, whereas during the war it probably accounted for 50 percent or more.

BUSINESS INDEXES—TWELFTH DISTRICT¹

(1935-39 average = 100)

Year and Month	Industrial production (physical volume) ²								Total mf'g employment ⁴	California factory payrolls ⁴	Car-loadings (number) ²	Dep't store sales (value) ²	Dep't store stocks (value) ⁵	Retail food prices ^{6,7}
	Lumber	Petroleum ³		Cement	Lead ³	Copper ³	Wheat flour ³	Electric power						
	Crude	Refined												
1929.....	148	129	127	110	171	160	106	83	....	111	135	112	134	132.0
1930.....	112	101	107	96	146	106	100	84	....	93	116	104	127	124.8
1931.....	77	83	90	74	104	75	101	82	....	73	91	92	110	104.0
1932.....	46	78	84	48	75	33	89	73	....	54	70	69	86	89.8
1933.....	62	76	81	54	75	26	88	73	....	53	70	66	78	86.8
1934.....	67	77	81	70	79	36	95	79	....	64	81	74	83	93.2
1935.....	83	92	91	68	89	57	94	85	....	78	88	86	88	99.6
1936.....	106	94	98	117	100	98	96	96	100	96	103	99	96	100.3
1937.....	113	105	105	112	118	135	99	105	112	115	109	106	108	104.5
1938.....	88	110	103	92	96	88	96	102	96	101	96	101	101	99.0
1939.....	110	99	103	114	97	122	107	112	104	110	104	109	107	96.9
1940.....	120	98	103	124	112	144	103	122	118	134	110	119	114	97.6
1941.....	142	102	110	164	113	163	103	136	155	224	127	139	137	107.9
1942.....	141	110	116	194	118	188	104	167	230	460	137	171	190	130.9
1943.....	137	125	135	160	104	192	115	214	306	705	133	203	174	143.4
1944.....	136	137	151	128	93	171	119	231	295	694	140	223	179	142.1
1945.....	109	144	160	131	81	137	132	219	229	497	134	247	183	146.3
1946.....	130	139	148	165	73	109	128	219	175	344	135	305	238	167.4
1947.....	141	147	159	193	98	163	133	256	184	401	142	330	300	200.3
1947														
August.....	142	148	166	185	96	164	125	252	183	407	141	353	251	197.9
September.....	143	147	162	193	98	168	123	259	184	413	139	347r	266r	206.6
October.....	148	148	166	187	96	141	133	260	187	419	141	340	293	204.8
November.....	154	150	163	205	107	151	133	263	188	421	143	348	327	209.4
December.....	162	149	160	215	98	161	116	275	188	423	144	361	353	213.0
1948														
January.....	144	150	166	218	106	163	114	278	187	418	141	348	360	215.4
February.....	152	150	166	207	112	166	104	283	187	417	130	327	377	213.0
March.....	148	151	164	216	109	157	101	274	187	406	131	339	388	211.6
April.....	133r	152	166	216	110	164	116	275	184	396	130	362	386	216.0
May.....	122	152	172	202	102	164	108	263	180	406	123	364	347	217.6
June.....	128	153	168	196	102	165	115	266	185	424	134	372	335	216.6
July.....	134	152	167	202	96	159	123	284	190	440	137	365	328	218.1
August.....	140	153	171	202	102	166	124	289	195p	455	141	383	302	218.0
September.....	138	123	110	215	....	....	118	295	197p	454	146	355	311	218.0

BANKING AND CREDIT STATISTICS—TWELFTH DISTRICT

(amounts in millions of dollars)

Year and month	Condition items of all member banks ⁷				Member bank reserves and related items ⁸					Bank debits index 31 cities ^{9,11} (1935-39 = 100) ²
	Loans and discounts	U.S. Gov't securities	Demand deposits adjusted ⁹	Total time deposits	Reserve bank credit ¹⁰	Commercial operations ¹⁰	Treasury operations ¹⁰	Coin and currency in circulation ¹⁰	Reserves	
1929.....	2,239	495	1,234	1,790	- 34	0	+ 23	- 6	175	146
1930.....	2,218	467	1,158	1,933	- 16	- 53	+ 89	+ 16	183	126
1931.....	1,898	547	984	1,727	+ 21	- 154	+ 154	+ 48	147	97
1932.....	1,570	601	840	1,618	- 42	- 175	+ 234	+ 30	142	68
1933.....	1,486	720	951	1,609	- 2	- 110	+ 150	+ 18	185	63
1934.....	1,469	1,064	1,201	1,875	- 7	- 198	+ 257	+ 4	242	72
1935.....	1,537	1,275	1,389	2,064	+ 2	- 163	+ 219	+ 14	287	87
1936.....	1,682	1,334	1,791	2,101	+ 6	- 227	+ 454	+ 38	479	102
1937.....	1,871	1,270	1,740	2,187	- 1	- 90	+ 157	- 3	549	111
1938.....	1,869	1,323	1,781	2,221	- 3	- 240	+ 276	+ 20	565	98
1939.....	1,967	1,450	1,983	2,267	+ 2	- 192	+ 245	+ 31	584	102
1940.....	2,130	1,482	2,390	2,360	+ 2	- 148	+ 420	+ 96	754	110
1941.....	2,451	1,738	2,893	2,425	+ 4	- 596	+ 1,000	+ 227	930	134
1942.....	2,170	3,630	4,356	2,609	+ 107	- 1,980	+ 2,826	+ 643	1,232	165
1943.....	2,106	6,235	5,998	3,226	+ 214	- 3,751	+ 4,486	+ 708	1,462	211
1944.....	2,254	8,263	6,950	4,144	+ 98	- 3,534	+ 4,483	+ 789	1,706	237
1945.....	2,663	10,450	8,203	5,211	+ 76	- 3,743	+ 4,682	+ 545	2,033	260
1946.....	4,068	8,426	8,821	5,797	+ 9	- 1,607	+ 1,329	+ 326	2,094	298
1947.....	5,363	7,243	8,928	6,006	- 302	- 443	+ 630	- 206	2,202	326
1947										
September.....	4,997	7,364	8,600	5,924	- 87	- 85	+ 172	- 10	2,095	326
October.....	5,158	7,361	8,722	5,964	+ 23	- 39	+ 35	- 16	2,137	346
November.....	5,240	7,361	8,797	5,922	- 4	- 0	+ 33	+ 3	2,130	344
December.....	5,363	7,243	8,928	6,006	- 25	- 5	+ 49	- 18	2,202	365
1948										
January.....	5,413	7,264	8,854	6,021	+ 14	+ 48	- 253	- 113	2,113	352
February.....	5,467	7,021	8,495	6,063	+ 20	+ 153	- 244	- 2	2,045	354
March.....	5,510	6,945	8,452	6,044	- 49	+ 29	- 19	- 37	2,066	347
April.....	5,509	6,943	8,461	6,019	+ 9	+ 75	+ 29	- 17	2,048	353
May.....	5,569	6,883	8,445	6,008	+ 30	- 14	+ 45	+ 26	2,068	342
June.....	5,598	6,859	8,464	6,057	- 14	- 50	+ 28	- 13	2,061	348
July.....	5,640	6,816	8,556	6,010	+ 15	- 38	+ 43	- 11	2,075	354
August.....	5,743	6,712	8,555	6,005	- 23	+ 1	+ 12	+ 17	2,065	356
September.....	5,848	6,394	8,661	6,003	+ 17	+ 427	- 98	+ 2	2,409	359
October.....	5,910	6,440	8,647	6,018	+ 12	- 8	- 35	+ 8	2,351	363

¹ All monthly indexes but wheat flour, petroleum, copper, lead, and retail food prices are adjusted for seasonal variation. Excepting for department store statistics, all indexes are based upon data from outside sources, as follows: Lumber, various lumber trade associations; Petroleum, Cement, Copper, and Lead, U.S. Bureau of Mines; Wheat flour, U.S. Bureau of the Census; Electric power, Federal Power Commission; Manufacturing employment, U.S. Bureau of Labor Statistics and cooperating state agencies; Factory payrolls, California State Division of Labor Statistics and Research; Retail food prices, U.S. Bureau of Labor Statistics; and Carloadings, various railroads and railroad associations. ² Daily average. ³ Not adjusted for seasonal variation.

⁴ Excludes fish, fruit, and vegetable canning. Factory payrolls index covers wage earners only. ⁵ At retail, end of month or year. ⁶ Los Angeles, San Francisco, and Seattle indexes combined. ⁷ Annual figures are as of end of year; monthly figures as of last Wednesday in month or, where applicable, as of call report date. ⁸ End of year and end of month figures. ⁹ Demand deposits, excluding interbank and U.S. Gov't deposits, less cash items in process of collection. Monthly data partly estimated. ¹⁰ Changes from previous month or year. ¹¹ Debits to total deposit accounts, excluding interbank deposits. *p*—preliminary. *r*—revised.