

Monthly Review

FEDERAL RESERVE BANK OF SAN FRANCISCO

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CONSTRUCTION ACTIVITY

THE upward trend in recent months in expenditures on construction in the United States was reversed in September. The Bureau of Labor Statistics reported a slight decline in total expenditures for that month. A seasonal drop in farm construction in September and a very slight drop in non-farm residential construction more than offset small increases in some types of business construction and other non-residential building to account for a decline in September expenditures for privately-financed construction of \$8 million from the August level of \$1,354 million. Public construction totaled \$447 million in September, about the same as the total dollar volume reported for August.

As the accompanying table indicates, total expenditures for new construction during the first nine months of this year exceeded those of last year by more than a third. The increase in expenditures for privately-financed

the highest level since October 1942. This is about one-quarter of a million less than the wartime peak reached in August 1942.

Corresponding data on construction activity for the Twelfth District are published only on a quarterly basis, and the results for the third quarter of this year are not yet available. On the basis of the experience in the first half of the year, however, it is reasonable to assume that the trends in construction activity in the Twelfth District during the third quarter have been similar to those in the country as a whole. In California and Washington, which have monthly data on construction employment, the volume of such employment has risen to progressively higher levels in each of the first seven months of this year, and has been at a substantially higher level than in the corresponding period a year ago.

Housing starts decline

While current construction activity is at an all-time high, there are some indications of a possible decline in its volume in the near future, particularly in residential building. For the country as a whole, August housing starts, totaling 83,000 units, fell 12 percent below those of July of this year, and 4 percent below those of August 1947. This was the sharpest month-to-month drop so far this year, and was also the first time in 18 months that housing starts had dropped below those of the corresponding month of the previous year. Preliminary estimates by the Bureau of Labor Statistics indicate a further small decline in September. The estimated 81,000 units started in that month represent a decline of 14 percent from the corresponding month a year ago. It should be noted in this connection, however, that housebuilding in 1947 departed rather drastically from the normal seasonal pattern, which is characterized by a peak of activity in the spring and early summer. The peak last year came in September and October, when about 94,000 family dwelling units were started in each of those months. In 1948, on the other hand, the peak, in terms of present estimates, will probably be the 99,400 started in May. Another factor which helped to produce the difference in the timing of these two peaks was the rush this year to secure commitments for loans insured by the Federal Housing Administration before the expiration on April 30 of the liberal terms of Title VI of the National Housing Act.

Even though housing starts should continue to decline for the remainder of this year, it is certain that the number

EXPENDITURES FOR NEW CONSTRUCTION PUT IN PLACE¹—
UNITED STATES
(amounts in millions)

Type of construction	Expenditures (first 9 months of—)		Percent increase
	1948 ²	1947	
Total new construction ³	\$13,029	\$9,728	34
Private construction	10,117	7,526	34
Residential building (nonfarm)	5,175	3,430	51
Nonresidential building (nonfarm) ⁴	2,650	2,285	16
Industrial	1,052	1,295	-19
Commercial	934	569	64
Other	664	421	58
Farm construction	426	360	18
Public utilities	1,866	1,451	29
Public construction	2,912	2,202	32
Educational	375	187	101
Hospital and institutional	131	56	134
Highways	1,129	871	30
Other	1,277	1,088	17

¹ Joint national estimates of the Bureau of Labor Statistics, U. S. Department of Labor, and the Office of Domestic Commerce, U. S. Department of Commerce. Estimated construction expenditures represent the monetary value of the volume of work accomplished during the given period of time.

² Preliminary.

³ Includes major additions and alterations.

⁴ Excludes nonresidential building by privately-owned public utilities.

construction was due mainly to the large increase in expenditures for new homes. Approximately half the dollar increase in public construction occurred in nonresidential building, particularly in educational and hospital projects. As usual, the amount of expenditures on highway construction exceeded that for any other type of public construction, and constituted 39 percent of all publicly-financed work.

Employment by construction contractors in both August and September was estimated at 2,257,000 workers,

of houses started during the full year 1948 will exceed that for 1947 and may equal the record total of 937,000 units started in 1925. It is estimated that 729,500 houses had been started through September of this year, which is 113,000 above the corresponding period of last year, and only about 120,000 short of the 849,000 houses started in the full year 1947.

Corresponding data are not published for the Twelfth District. The Bureau of Labor Statistics indicates, however, that housing starts in California reached a peak in April and since then have declined continuously through August, the latest month for which data are available. This is of considerable significance because California has accounted for a sizable portion of the national total of new houses started during the past three years.

Urban residential building permits also decline

The number of urban residential building permits issued also appears to have turned downward in recent months. Part of the downturn is a reaction from the unusual March-April peak induced by the rush to secure commitments for Title VI FHA loans before April 30. In addition to this rather artificially-induced decline, there appears to be a more fundamental decline taking place. This reflects an increasing sluggishness in many areas of the sale of houses, both old and new. This sluggishness is the result of several factors which will be indicated below.

Residential building permits issued in urban areas have been declining in the country as a whole since the April peak. In July, the latest month for which complete data have been published, permits were issued for about 47,800 family dwelling units. This was about one-fourth below the April peak. Their value was 21 percent less than the April total, bringing the total value of building permits for all types of construction in July to 10 percent below the April peak, although the value of permits issued for nonresidential construction in July was the third highest for any month so far this year. Preliminary reports indicate a very slight drop in residential permits issued in August, and a further small decline in September.

In the first seven months of this year, permits issued for family dwelling units increased 33 percent in number and 50 percent in value over the corresponding period of 1947. The value of permits issued for all other types of construction was about 46 percent higher.

In the Twelfth District, the number of urban residential building permits issued has declined continuously since the March-April peak, with the exception of August. The total for that month even exceeded by a substantial margin the March-April peak, but solely because it included permits for a very large apartment project, embracing 2,700 family dwelling units, in Los Angeles. Without this large project, District urban residential building permits, both in value and in number of dwelling units, would have reached the lowest level in August for any month so far this year.

The value of permits for other types of construction have also shown a general, but more irregular, downward

trend in the District since the March-April peak. In August, their value rose above the July level but was still substantially below the earlier peak.

The value of District urban building permits issued for all types of construction in the first eight months of this year was 53 percent above that for the corresponding period a year ago. The value of building permits issued

URBAN BUILDING PERMITS ISSUED¹—TWELFTH DISTRICT
(dollar amounts in millions)

Period	All building construction	New dwelling units		Other new construction
		Number	Value	
1948 January	\$115.4	9,873	\$67.7	\$ 32.0
February	112.8	11,093	74.6	24.4
March	151.5	12,220	88.4	46.2
April	147.5	12,132	86.4	44.0
May	139.8	11,627	82.0	38.6
June	139.1	10,843	80.5	41.1
July	117.3	9,193	69.2	31.3
August ²	153.9	10,984	100.8	38.0
Total first 8 months of 1948...	1,077.3	87,965	649.6	295.6
Total first 8 months of 1947...	701.9	65,256	396.5	193.0
Percent increase, 1948 over 1947	53	35	64	53

¹ These tabulations pertain only to permits issued for building construction within urban areas. Urban, as defined by the Bureau of the Census, covers all incorporated places of 2,500 population or more in 1940 and, by special rule, a small number of unincorporated civil divisions. Building outside of these city limits is excluded, even when it is located in populous suburban areas that may be an integral part of a city's economic and social life.

² Preliminary.

Source: United States Department of Labor.

in urban areas for all types of construction rose substantially in the first eight months of this year compared with the same period a year ago in all states of the District except Nevada, where it declined somewhat more than 20 percent. This decline was common to both residential permits and permits for other types of buildings. In Idaho, on the other hand, the increase of 65 percent in the value of permits for all construction activity, and 93 percent in the value of residential permits, led all the states in the District. The percentage increases in California were somewhat larger than for the District as a whole. In the first eight months of this year, California accounted for 80 percent of the total value of urban residential permits issued in the District and 75 percent of the total value of those issued for other types of construction.

Probable decline in residential construction expenditures

If the declines in housing starts and in residential building permits continue, a reduction in the volume of expenditures for this type of construction activity is inevitable. Because of the time lag between the issuance of a permit and the start of construction, and because of the time required for construction, the reduction in expenditures will not make itself apparent immediately.

Although the volume of expenditures has declined from August, it is not likely to drop significantly below the level of the final quarter of last year. The volume of work currently under way is still quite large and will prevent any great decline in expenditures for at least the remainder of this year. By early next year, however, the cumulative effect of the downward trend in housing starts, if not reversed soon, will begin to reflect itself in a more sharply declining volume of expenditure for residential construction activity.

The trend of total construction expenditures in the near future is more difficult to predict. In addition to the probable decline in residential construction, there may also be some decrease in expenditures for nonresidential construction. In the Twelfth District, building permits authorized in urban areas for nonresidential construction have shown a generally downward trend from April through August. For the country as a whole, however, no definite trend is discernible, though in June and July they were nearly equal in amount to the March peak. Publicly-financed construction, on the other hand, will undoubtedly rise above current levels. There is a large backlog of urgently needed projects in this field, of which schools and highways are two important examples. In all probability, the expected increase in public construction will prevent any appreciable drop in total construction expenditures.

Housing market relatively slow

It is reported from many areas in the Twelfth District and throughout the country that the sale of houses, both old and new, has slowed down substantially within recent months. So far, at least, this slowness has not resulted in any general decline in the prices of houses. Instead, it has meant that they have had to remain upon the market for a substantially longer period of time before they have been sold. Several factors help to account for this situation.

The more urgent postwar demands for housing have been met. Although many people are still interested in buying new houses, their needs are relatively less urgent than were the needs of many people in the earlier postwar period. These people, therefore, are in a position to be more selective in their choices of houses, which means that they can wait longer to find the type of house that they want.

Some potential buyers of houses have been forced out of the market within the past year due to the rise in prices, both in houses and in the general cost of living. Building costs have probably risen more than 10 percent and the over-all cost of living about 10 percent during the past year. The incomes of many people have failed to rise correspondingly in the same period, with the result that they cannot afford to buy a house now even though their need may be fairly urgent.

Another important factor on the financial side has been the tightening of credit terms in recent months. Because of a gradual rise in other interest rates, lending institutions have become increasingly reluctant to make mortgage loans at 4 percent, which has been the prevailing rate for most of the postwar loans guaranteed either by the Federal Housing Administration or the Veterans' Administration. With the expiration on April 30, 1948 of Title VI of the National Housing Act, which contained liberal terms for insured mortgages for the purchase of individual homes, FHA financing shifted to Title II. The interest rate under Title II is 4.5 percent and the amount of the mortgage which will be insured is a smaller percentage of the current market value than was the case

under Title VI. The interest rate on VA loans is still 4 percent, but many lending institutions are not willing to make loans now at that rate.

An increasing proportion of the VA loans now being made are combination FHA and VA loans. The maximum FHA loan is obtained as a first mortgage at 4.5 percent and in addition the VA will guarantee a second mortgage, which carries a rate of 4 percent, not to exceed 20 percent of the purchase price or \$4,000, whichever is smaller. Of the total loans approved by the VA in August of this year, 30 percent were of the combination FHA-GI type. In contrast, in the same month a year ago only 10 percent of all the VA loans approved were of this type.

The ratio is substantially higher in the Twelfth District. In California, for example, the ratio of combination loans was about 45 percent for August of this year. Since California has a larger volume of new residential construction than any other state in the nation, relatively more of the mortgage loans made in that state are for the purchase of new homes as distinct from old ones. Consequently, on the average, larger mortgages are required in California. The rise in construction costs has accentuated this need for larger mortgages. Increasingly they are being obtained in the form of combination FHA-GI loans.

Among non-veterans, there is increasing use in some areas of second mortgages obtained from private sources, in many cases from the builder. This is especially true with respect to houses selling in what might loosely be termed the medium price bracket. Many builders are finding that these houses can readily be sold only with the aid of second mortgages.

The larger down payments now required, as compared with a year or two ago, exclude many potential buyers from the housing market. Many people may be able to meet the somewhat higher monthly payments that have been occasioned by the shift from Title VI to Title II financing, but these same people may not be able to meet the larger down payments that have been the product, on the one hand, of rising prices for houses and, on the other, of the shift from Title VI to Title II provisions.

Housing credit liberalized in August

In the special session of Congress which adjourned in August of this year, the terms for insuring mortgages under certain sections of the National Housing Act were liberalized. The changes appear to have two primary objectives: (1) to provide more liberal financing terms for single and multiple-unit homes in medium- and low-price brackets; (2) to encourage the construction of large-scale rental projects. In general, the changes took the form of providing larger insured mortgages both for lower-priced houses to be offered for sale and for multiple-unit rental projects. A system of "yield insurance" was also established for the latter. In a few cases, maturities for mortgages were lengthened and low interest rates (4 percent) established or maintained. In several cases, however, there is provision for an increase in interest rates by administrative regulation if conditions in the mortgage

market demand it. Included in the latter is an authorization permitting the Veterans' Administrator to raise the interest rate on GI loans to a maximum of 4.5 percent if that is necessary to secure a supply of funds for such loans. The scope of the secondary market for mortgages maintained by the Federal National Mortgage Association was enlarged substantially.¹

The Federal Housing Administration received more applications for mortgage insurance in September than in any month since April of this year, although it is too soon for the recent changes in FHA insurance terms to have had too great an effect. The maximum FHA insured mortgage for small owner-occupied homes was increased from \$8,600 to \$9,500 under Title II. Such loans carry an interest rate of 4.5 percent, plus 0.5 percent for mortgage insurance, and may run for 25 years. Due to higher building costs, this increased loan maximum still leaves a down payment sufficiently large to exclude many potential buyers from the market.

The new law added a provision to Title II which establishes even more liberal terms than those above for insuring mortgages not in excess of \$6,000. The maximum rate of interest on these loans is 4 percent, except that the Federal Housing Administrator may raise it to not more than 5 percent if necessary to meet conditions in the mort-

¹For a more detailed discussion of the provisions for FHA and GI mortgage loans and recent changes therein, see the article, "Trends in Housing Finance and Residential Construction," in the June issue of the *Monthly Review*, and also page 67 in the August issue.

gage market. The rate has actually been set at 4.5 percent. A new section was added to Title VI providing for insurance of mortgages covering properties upon which 25 or more single-family houses are to be constructed. The interest rate on these loans is set at 4 percent, with authorization to increase it to 4.5 percent. As indicated previously, however, there is a growing scarcity of 4 percent mortgage credit, so this new section may not have much practical effect unless the rate of interest is raised above 4 percent.

Some of the provisions for insurance of mortgages on multiple-unit rental projects also specify a rate of 4 percent. Reports indicate that some builders are interested in undertaking rental projects under these provisions, but they also are confronted with the scarcity of 4 percent money.

In this connection, it should be noted that rental housing in recent months has accounted for a greater proportion of all new residential construction than was true a year or two ago. Rental-type units numbered one out of five of all new units started in the first five months of 1948, compared with one out of ten in the corresponding period of 1947. The ratio in 1947 was abnormally low compared with the prewar average. It is rather generally recognized that the housing needs of many people are better met by renting than by buying. The trend this year towards a larger proportion of rental units is therefore a desirable one.

BASING POINTS, FREIGHT ABSORPTION, AND THE PACIFIC COAST STEEL INDUSTRY

EARLY in July of this year the basing point system of price quotation was abandoned by the steel industry. Playing a large part in this changeover to an f.o.b. system were the decisions of the Supreme Court on the basing point system, particularly in the cement case, and pressure exerted by the Federal Trade Commission on the steel industry. Two questions are of particular concern to western industry at this time: first, how were Pacific Coast steel prices affected, and second, is freight absorption barred in each and every case.

How the basing point system operated

Under the basing point system as used by the steel and cement industries, prices were quoted at specified places known as basing points. A buyer paid the price at the nearest basing point plus rail freight from that point to his plant, regardless of where the seller was located. This resulted in a uniform price to a buyer from all sellers. It did not, however, result in the same prices to all buyers, but only to those located at the same market point or having identical freight rates from a common basing point.

Two practices resulted from this system, referred to by the industry as "freight absorption" and "phantom freight." If a buyer bought from a mill farther away than the nearest basing point, the mill charged only the price plus freight from the nearest basing point; the difference

in freight cost was absorbed by the seller and was referred to as freight absorption. Phantom freight resulted if the buyer purchased from a nonbase mill closer than the nearest basing point and paid the full freight from the basing point. Phantom freight also arose when water shipments from an established basing point were involved. Rail freight, which exceeds water freight for comparable distances, was charged the consumer from the basing point to his plant even though the steel was shipped by water.

The basing point system differed from an f.o.b. system in that the buyer in one case paid freight from a predetermined point regardless of the location of the seller, while in the other case he paid freight from the actual point of shipment. The more basing points there were created and the more users bought from the nearest basing point, however, the more the basing point method resembled an f.o.b. system.

The basing point and f.o.b. systems on the Pacific Coast

During the N.R.A. the Pacific Coast ports became basing points for steel products. Delivered prices at each of the major ports were the same. The base price for these ports was arrived at by adding to the Sparrows Point, Maryland base price water freight and switching charges to the Pacific Coast. This system was in effect until January 9, 1947, except for the war period. In order to illus-

trate the structure of prices, the following table gives the lowest Eastern basing point quotation and the Pacific Coast ports price for five items as of January 9, 1947.

	Lowest Eastern	Pacific Coast Ports
	(dollars per cwt.)	
Sheets—hot rolled	2.50	3.085
Sheets—cold rolled	3.20	3.885
Sheets—galvanized	3.55	4.135
Carbon plates	2.65	3.235
Structural shapes	2.50	3.185

(Water rate from Sparrows Point, Maryland 68.5 cents per cwt. including "arbitrariness" and insurance. Lowest Eastern price plus water freight will not add to Pacific Coast ports prices in each instance because of a difference in price between basing points.)

Pacific Coast mills charged the Pacific Coast ports price for delivery at the respective ports. For delivery to inland points freight was computed from the nearest port. In some cases, for example, when an inland mill sold to a customer at its door, the mill "earned" phantom freight.

This plan was abandoned during the war because commercial shipments via the Canal were restricted. The O.P.A. permitted California buyers to be billed at the Eastern base price plus actual freight. Since the end of the war, however, some producers, especially in the Middle West, refused to resume the Pacific Coast basing points. They would accept Pacific Coast business only on a straight f.o.b. basis. Even then, the pressure of demand in areas adjacent to Middle Western mills reduced their shipments to this area considerably. After January 9, 1947 the Pacific Coast ports base was abandoned by the industry. Pacific Coast mills in some cases adhered to the old base while others quoted only for the port nearest them. In effect, the Pacific Coast was on an f.o.b. basis long before the Supreme Court decision in the cement case.

The changeover to an f.o.b. system

The effect of the changeover can best be illustrated by comparing prices for a few items, on a national basis,

STEEL PRICES IN THE UNITED STATES FOR SELECTED ITEMS AND DATES

	Lowest U. S. basing point June 24, 1948	Lowest U. S. mill price July 13, 1948	Lowest U. S. mill price July 21, 1948	Increase per ton July 13-21
	(dollars per cwt.)			
Sheets—hot rolled	2.75	2.75	3.25	10.00
Sheets—cold rolled	3.45	3.45	4.00	11.00
Sheets—galvanized	3.85	3.85	4.40	11.00
Carbon plates	2.90	2.90	3.40	10.00
Structural shapes	2.75	2.75	3.25	10.00

before July 13 when the basing point system applied, July 13, the first available quotations under f.o.b., and July 21 after prices were increased generally.

Between June 24 and July 13 there was no change in the quoted prices, but freight had to be paid from the actual point of shipment rather than from the nearest base mill. For the large number of users who customarily purchased from the nearest basing point which was also the nearest mill, no change occurred since the freight involved remained the same. For the users who bought from mills more distant than the nearest basing point, the cost of steel increased by the amount of freight formerly absorbed by the seller. But other users experienced a reduction in price between June 24 and July 13 because they had been paying phantom freight either because they had been buying from a nonbase mill closer than the nearest basing point or because they had been paying rail freight whereas shipment was actually made by water.

No reliable estimates of the extent of freight absorption or phantom freight are available. On balance, it appears from industry statements that freight absorption under the basing point system tended to exceed phantom freight somewhat in recent years. This assumption is based on the location of the major fabricating centers relative to basing points. A slight increase in the over-all price of steel to steel-users may have resulted from the changeover to an f.o.b. system. The changeover from a basing point system to an f.o.b. system can hardly dictate, however, any permanent change in cost independent of demand and supply conditions. Thus the general increase in price between July 13 and July 21 reflects not a change in the method of quoting prices, but increased labor and material costs plus the fact that since the end of the war, the demand for steel has been and no doubt still is in excess of supply.

Since the Pacific Coast had been substantially on an f.o.b. basis for some time, little change occurred. Comparison of the price schedules confronting a firm in San Francisco buying both from the East and from Pittsburg, California, is of interest, nevertheless.

For shipments from mills outside the coastal area, no change occurred as a result of the adoption of the f.o.b. quoting method. The only evident difference between June 24 and July 13 arises from the fact that San Francisco was no longer a basing point, and freight was charged from Pittsburg, California instead of from San Francisco. Thus, for hot rolled and galvanized sheets the price went up 8 cents per cwt. or an increase of \$1.60 a ton. East Bay users, on the other hand, closer to Pittsburg (California) than to the port of Oakland probably

PRICES¹ OF STEEL IN SAN FRANCISCO, CALIFORNIA FOR SELECTED DATES AND ITEMS

	Lowest deliv. price 6-24-48	Lowest deliv. price 7-13-48	Lowest deliv. price 7-21-48	Cost from selected points on July 21							
				Chicago		Sparrows Pt. ²		Geneva		Pittsburg, California	
				Mill price	Total	Mill Price	Total	Mill Price	Total	Mill Price	Total
	(dollars per cwt.)										
Sheets—hot rolled	3.449	3.53	4.03	3.25	4.61	3.30	4.18	...	...	3.95	4.03
Sheets—cold rolled	4.280	4.28	4.98	4.00	5.36	4.10	4.98	...	...	...	...
Sheets—galvanized	4.604	4.68	5.23	4.40	5.76	4.50	5.38	...	...	5.15	5.23
Carbon plates	3.480	3.48	3.98	3.40	4.76	3.45	4.33	3.40	3.98	...	...
Structural shapes	3.330	3.33	3.83	3.26	4.61	3.30	4.18	3.25	3.83	...	...

¹Excluding 3 percent tax on freight.

²These prices apply to all Pacific Coast ports because water freight is uniform.

experienced a slight price reduction when the f.o.b. system was introduced. But the impact on prices for items acquired from non-coast mills was nil, and the \$1.60 increase was dwarfed by the \$10.00 to \$11.00 per ton increase a week later.

May freight be absorbed?

The question of freight absorption or price competition in distant markets is the central problem posed by advocates of a legalized basing point system. On April 26, 1948 the Supreme Court sustained an order of the Federal Trade Commission against the Cement Institute and 73 cement companies. There were two counts on which the order was based. The first dealt with the basing point system as a means of unfair competition in violation of the Federal Trade Commission Act; the Commission was sustained here as well as on the second count.

The second count, charging price discrimination, is the one of real significance in this discussion. Price discrimination is forbidden by section 2 (a) of the Clayton Act as amended by the Robinson-Patman Act which declares it to "be unlawful for persons engaged in commerce . . . either directly or indirectly, to discriminate in price between different purchasers of commodities of like grade and quantity . . . *Where the effect of such discrimination may be substantially to lessen competition in any line of commerce, or to injure, destroy, or prevent competition with*¹ any person who either grants or knowingly received the benefit of such discrimination . . ." Proof of such discrimination makes out a prima facie case of violation, but the seller may rebut the charge in accordance with section 2 (b) of the act if he can show that the lower price "was made in good faith to meet the equally low price of a competitor."

The Commission held, and the Supreme Court supported, the view that the basing point system, since it involved freight absorption and phantom freight and therefore resulted in significantly different net returns to a seller on business with different and competing buyers, constituted a prima facie case that discrimination existed. The rebuttal of the charge—that the prices were made in good faith to meet competition—was not accepted by the Court. It ruled ". . . but this does not mean that section 2 (b) permits a seller to use a sales system which constantly results in his getting more from some customers than from others . . . *The Act . . . places emphasis on individual competitive situations*¹ rather than upon a general system of competition." In effect the Supreme Court ruling required that if one buyer is given a lower price than other competing buyers, a specific situation must exist where a competitor's lower price is being met.

The question still remains, however, whether or not freight absorption is permissible. Although discussion on this question reflects a variety of opinions, the remarks of the Supreme Court in the cement case are of interest. "Most of the objections to the order appear to rest on the premise that its terms will bar an individual cement producer from selling cement at delivered prices such that its net return from one customer will be less than from another, even if the particular sale be made in good faith to meet the lower price of a competitor. The Commission disclaims that the order can possibly be so understood. Nor do we so understand it . . ." If the decision can be taken literally, it would appear that an individual firm may absorb freight provided there is no collusion with others and competition among buyers or their customers is not adversely affected.

¹Italics ours.

COMMERCIAL FISHERIES OF CALIFORNIA

CALIFORNIA has for many years led the nation in fish landed by commercial fishermen and in canned fishery products and byproducts, in terms of both quantity and value. In 1915 the total catch of fish and shellfish in the state amounted to 100 million pounds. Increased exploitation of the sardine fishery, which began during World War I, resulted in a rather steady rise of the total catch until 1929 when it reached 857 million pounds. Both the sardine catch and the total catch fell by more than 50 percent during the following two years, indicating clearly the influence of the depression on the industry. Soon thereafter the industry began to expand again. During the 1934-44 period, the greatly increased catch of sardines, which averaged 1.1 billion pounds annually, kept the total catch of fish in the state at the extremely high average of 1.4 billion pounds annually. Due to the failure of the sardine fishery during the past two years, total California landings of fish and shellfish have been reduced to a level below a billion pounds for the first time since 1933. The 1947 total catch amounted to 793 million pounds, of which only 255 million were sardines. Thus the total vol-

ume of fish landings in California is closely related to the success of the sardine fishery.

The fishery industry of California is greatly diversified, exploiting commercially about 50 species of fish and shellfish. Both fishermen and processors derive the bulk of their incomes from the sardine (pilchard) and tuna. These species represent the most important marine resources of the state, producing between 1928 and 1945 an average of 71 percent of the total income of California fishermen. Shellfish play only a minor role in the total picture, and the value of landed shellfish during the period 1941-45 averaged only 2.8 percent of the total. Small whaling operations have long been conducted in California, but none during the period 1944 to 1946. In 1947 the increased numbers of whales in nearby waters led to the resumption of whaling.

Landings by regions and fishing grounds

The landings of fresh fish and shellfish for processing and other uses are concentrated in the regions of San Francisco, Monterey, Los Angeles, and San Diego. The

CALIFORNIA FISH AND SHELLFISH LANDINGS BY REGIONS,
VOLUME AND VALUE

(in millions of pounds and thousands of dollars)

Areas	1941-44 average		1945		1946		1947 ¹ Vol- ume
	Vol- ume	Value	Vol- ume	Value	Vol- ume	Value	
Eureka	11.9	\$1,513	28.8	\$2,376	32.4	\$3,129	31.1
Sacramento	86.6	1,194	43.2	1,356	8.1	1,082	4.0
San Francisco ...	211.8	3,366	161.9	3,270	17.7	2,296	15.4
Monterey	461.1	4,989	339.6	4,640	123.1	3,010	76.1
Santa Barbara ...	10.0	573	5.5	706	3.9	734	22.6
Los Angeles	482.5	10,177	531.1	15,057	593.1	18,662	476.1
San Diego	83.5	7,363	105.9	11,266	141.1	16,433	167.9
Total California...	1,347.2	29,175	1,216.0	38,670	919.3	45,346	793.3

¹ Value figures not yet available.

Source: State of California, Department of Natural Resources, Division of Fish and Game, *The Commercial Fish Catch of California*, for the years 1941 and 1942, 1943 and 1944, 1945 and 1946; Fish Bulletins Nos. 59, 63, 67. Data for 1947 from *Statistical Report on Fresh and Canned Fishery Products, Year 1947*, Circular No. 22.

great differences in the relationship between the volume and the value of landings in various regions, shown in the accompanying table, are due to the composition of landings. Wherever landings of sardines predominate, the quantity-value ratio is very low as sardines fetch a relatively much lower price per pound than do other important species, particularly tuna and salmon.

The California fishery industry exploits not only waters off the California coast, but also large stretches of the Pacific Ocean off the Latin American coast. Thus of the total landings of fish and shellfish of 793 million pounds in 1947 not less than 240 million pounds or 30 percent came from the waters off the Latin American coast, representing more than 50 percent of all landings in terms of value. Practically the whole catch of yellowfin tuna, skipjack, bonito, and yellowtail, a large part of bluefin tuna, and some albacore come from these distant fishing grounds. Expansion of fishing in these parts has been one of the most important and interesting features of the California fishery industry in recent years, and, according to all indications, future expansion may continue in the same direction. A small amount of fresh fish processed in California is caught in the waters north of the California state boundary, most of which is landed in the Eureka region (1.6 million pounds in 1947).

Some tuna was shipped in 1947 to California for canning not only from waters north of the state boundary, but also from Mexico, from South America, and a token quantity from the United States Atlantic coast. The total amount of tuna brought into the state in this fashion amounted in 1947 to 1.8 million pounds. Before the war some frozen tuna was imported from Japan for canning in the Los Angeles area. These shipments were resumed in 1948, with canneries at Monterey, San Francisco, and Los Angeles receiving frozen albacore from Japan.

The sardine fishery—development of the catch

During the period 1928 to 1947 the California sardine or pilchard accounted on the average for 75 percent of total annual landings of fish and shellfish in the state. Between 1928 and 1945, an average of 29 percent of the total annual income of California fishermen was derived from the sardine fishery. This percentage fluctuated between 15 percent in 1932 and 41 percent in 1941.

As shown in the accompanying table, the total catch of sardines for processing has dropped by exactly four-fifths during the past three years.¹ But while sardines almost completely disappeared from the San Francisco and Monterey regions, the landings in San Pedro and San Diego were not affected until the 1947-48 season. The catch in

SARDINES: CATCH BY REGIONS AND SEASONS, 1941-42 TO 1947-48
(in tons)

Region	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48
San Francisco	185,921	115,586	126,132	136,337	83,483	2,846	383
Monterey ...	249,717	183,158	212,383	234,613	142,282	26,818	14,492
San Pedro ...	146,285	199,750	132,317	174,701	169,380	193,295	92,950
San Diego ...	1,540	2,847	2,690	2,764	945	4,757	2,412
Total	583,463	501,341	473,522	548,415	396,090	227,716	110,237

Note: Sardine fishing for processing is limited to the open season. The season in the San Francisco and Monterey regions lasts from August 1 to February 15 of the following year, and in the San Pedro and San Diego regions from October 1 to March 1. In these months sardines are at their best with regard to the texture of meat and the content of oil. This table does not include sardines caught for the fresh fish market, bait, salting, curing, smoking, and the so-called quarter oil pack. Fishing for sardines for these purposes is allowed throughout the year, but the catch is very small compared with that during the open season. The spawning season of the California sardine is February to July.

Source: State of California, Department of Natural Resources, Division of Fish and Game, *Statistical Report on Fresh and Canned Fishery Products*, from 1941 to 1947.

Southern California in 1947-48 was less than half that in the previous season, but it represented the result of a greatly increased fishing effort, as measured by the number of sardine fishing craft. The fishing effort in the sardine fishery has increased throughout the state despite greatly reduced catches during the past three seasons. The number of boats employed increased from 224 in the 1945-46 season to 290 in the 1947-48 season. In the San Pedro region the number of sardine fishing boats rose from 69 in the 1945-46 season to 149 in 1946-47 and to 180 in 1947-48. The explanation for the increased fishing effort is to be found in the continuing high demand for canned sardines and fish oil and steadily rising prices.

The price of fresh sardines

During the 1930's sardine prices fluctuated considerably, moving between \$4 per ton in the 1931-32 season and \$13 per ton in the 1937-38 season. In 1940-41 the price was \$11 per ton. The stoppage of fish oil imports from Japan at the end of 1941 led to a rise in the price of sardines in the 1941-42 season to \$17 per ton. From the 1942-43 season through the 1945-46 season, OPA ceilings kept the price of fresh sardines at \$22 per ton. At the beginning of the 1946-47 season the situation was confused. Until August 19, 1946, OPA maintained the ceiling of \$22 per ton, in spite of the industry-fishermen agreement setting the price at \$30 per ton, and no fishing was done as long as the price was \$22. Owing to the small catch and the removal of OPA ceilings on canned sardines, meal, and oil in mid-October 1946, the price in the San Francisco and Monterey areas rose for the remainder of the 1946-47 season to \$60-\$65 a ton. In Southern California it remained throughout that season at about \$40 a ton. The contract price throughout the state for the 1947-

¹ During the first two and a half months of the current season the sardine catch in the Monterey area was 27,054 tons, or approximately twice the catch of the entire 1947-48 season. During the same period this year the catch in the San Francisco area was only 396 tons. In the south the catch during the first four days of sardine fishing was 25,130 tons, slightly more than in the opening days last year.

48 season was \$45 a ton. Due, however, to a complete lack of fish in the two northern regions, the competition among buyers raised the price much higher, and certain lots of choice sardines reportedly have been sold at a price as high as \$115 a ton. The contract price for the 1948-49 season was set at \$67.50 a ton. Certain difficulties in connection with the enforcement of the size-limit regulations of the newly-established sardine conservation scheme (see below) which affected the pricing of fish in the Monterey area led to a strike of the fishermen early in October. The weakened market for canned sardines led to the refusal of the packers in the south to pay the contract price, thus resulting in a strike there. A new agreement concluded toward the end of October reportedly established a price of \$60 a ton.

The "disappearance" of the sardine

The "disappearance" of the sardine is a heavy blow to the sardine fishermen and processors, and, in view of the outstanding significance of the sardine fishery, a heavy blow to the whole fishery industry of the state. As sardines are one of the cheapest sources of good protein food and fish oil and meal, the failure of this fishery acquired particular significance because it came at a time of relatively short supply of these products.

The factors responsible for the failure of the sardine fishery are not yet explained. Some government officials who have been studying the fishery for years are of the opinion that the sardine fishery has met the fate of a number of other important commercial fisheries; that is, that it has been depleted through over-fishing. Other fishing authorities connect the fluctuating abundance of sardines with changing hydrographic conditions.

It cannot be denied that the intensity of effort in the sardine fishery has been extremely great during the past 15 years. Whether or not it was more intensive in the south or in the Monterey and San Francisco areas is unimportant, since the same sardine population is involved. One of the signs of falling abundance was the progressively smaller size of the fish caught. Soon the seasonal catch in the fishery became fully dependent upon a single year class (three-year-olds), and future abundance upon the survival of spawners from that class.

Those who feel that changing hydrographic conditions have played a major role in the failure of the sardine industry base their view upon the rather close direct correlation between the salinity of water in the sardine spawning waters of Southern California and the abundance of sardines three years later. The salinity of water depends upon upwelling (vertical movements of water masses in the ocean) which brings to the surface strata salts and minerals on which the plankton feeds. Plankton, in turn, serves as food for young sardines. Thus the reduced amount of upwelling leads to a poorer growth of plankton and consequently a smaller population of sardine year classes. Investigations of some important fisheries in Europe have proved that abundance of year classes depends directly on the conditions controlling the survival of young fish, especially in the critical phase

when they start to provide food for themselves. Chances of survival are directly related to the availability of food, and this in turn is a function of hydrographic changes. Other hydrographic changes which may be of similar importance for sardine propagation are shifts in ocean currents which, by influencing the salinity and temperature of water masses, affect also the location and abundance of feeding grounds.

The differences of opinion regarding the causes of the sardine disappearance will perhaps not be settled until several years hence when the results of the research work now under way are obtained. It is also only on the basis of full information on the life cycle and habits of the sardine that a scientific method of management of this fishery can be developed. Realizing, however, that the state of the sardine fishery requires immediate action, the state authorities and the industry have elaborated and put into operation a conservation program for the 1948-49 season. This program is as follows: (1) fishing allowed only five days a week; (2) fishing season reduced from 6½ months to 5½ months in the San Francisco and Monterey areas and from 5 to 4 months in the south; (3) a five-day closure during the full moon (which up to now was common practice but not a state rule); (4) legal size-limit established at 8 inches with a 25 percent leeway for fishermen; and (5) all operators required to deposit a \$5,000 performance bond. The program is being enforced by the California state authorities.

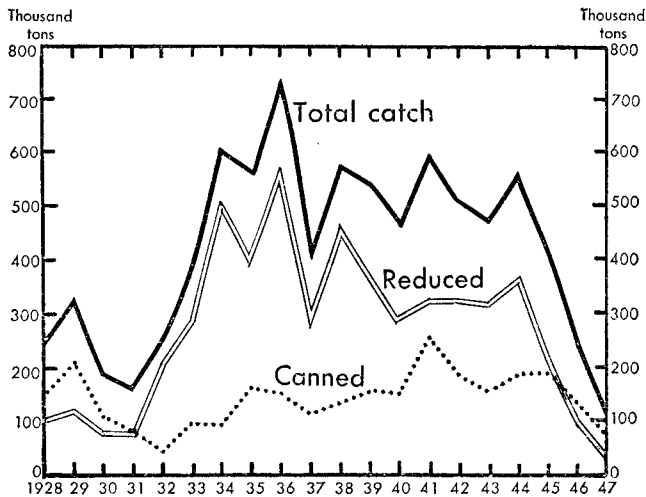
Of course, the sardine fishing fleet and sardine canners have been trying to adjust themselves to conditions created by the failure in the sardine fishery. San Francisco and Monterey sardine fleets operated during the past two seasons most of the time in Southern California waters. Some sardines caught in the south have been shipped or trucked for processing by the Monterey and San Francisco plants. The off-season pack of sardines was increased. The sardine fleet and the sardine processors utilized more substitutes. Furthermore, in and out of the sardine season, part of the sardine fleet engaged intensively in other fisheries, such as Pacific and jack mackerel, tuna, and the trawl fishery to compensate for the falling income in the sardine fishery.

Utilization of the sardine catch

The sardine catch in California is used for two basic purposes: for canning and for reduction into oil and fish meal. State laws require that every plant using sardines for reduction have a special permit for each season, but no permission is required for canning sardines. According to state law, packers cannot divert more than 32.5 percent of the sardines received for canning to reduction plants.¹ This limitation on diversion of sardines was considered necessary, since for many years before the war higher profits in production of oil than in canning produced a tendency to utilize an undue share of the total sardine catch for reduction. In addition to fish reduced under special permits and fish diverted from canning into reduc-

¹The law assumes that a ton of sardines will yield 960 one-pound cans; consequently, for every ton of sardines received for canning, a cannery must pack at least 648 one-pound cans.

SARDINES: CATCH AND UTILIZATION BY SEASON¹



¹ Season beginning August 1 and ending February 15 of following year. Source: State of California Department of Natural Resources, Division of Fish and Game.

tion plants, these plants utilize the offal of canned sardines for the production of oil and meal.

During the period 1932-33 to 1945-46, as shown in the accompanying chart, a relatively much larger share of the sardine catch was reduced. Since 1945-46 when the price differentials favored canning, a larger portion of the catch has been canned than in previous years.¹ During the last season only fish not fit for canning were sent to the reduction plants. During the 20 seasons 1928-29 to 1947-48, the California sardine industry canned on the average only 34 percent of the sardine catch, reduced into oil and meal 64.7 percent, and otherwise utilized the remainder.

Prior to the 1940-41 season, allocations of sardines to reduction plants varied according to their capacities, but since then all plants have been put on an equal basis. Between the 1930-31 and 1938-39 seasons a considerable quantity of sardines was delivered by the sardine fishing fleet for reduction to the floating plants operating off the coast in the Monterey and San Francisco areas, but outside the jurisdiction of the state control authorities. At the peak of their operations in 1936-37 there were nine such plants. In that year they processed their largest quantity, 235,590 tons, but the average for the nine seasons of their operation was 87,000 tons.

The accompanying chart shows the three products of the California sardine industry: pack of canned sardines, production of sardine oil, and production of fish meal between 1928 and 1946, with their respective values. The bulk of the sardine oil is used in the production of soap, paints, and linoleum. Until about 1935, large quantities of meal were used for fertilizer. Since about two years prior to the war, all of it has been used as feed for livestock and poultry. The increase in the value in recent years, in spite of reduced production, reflects the rise in prices of the respective products.

¹ Part of the sardines caught off-season is also canned, but the quantity has been small until this year, and the law provides that they must be packed "in cans commonly known as quarter-pound or square cans less than 10 ounces in net weight." This pack amounted to 55,265 cases in 1945, 17,880 cases in 1946, 112,795 cases in 1947, and 419,000 cases in 1948, in terms of 48 one-pound oval cans.

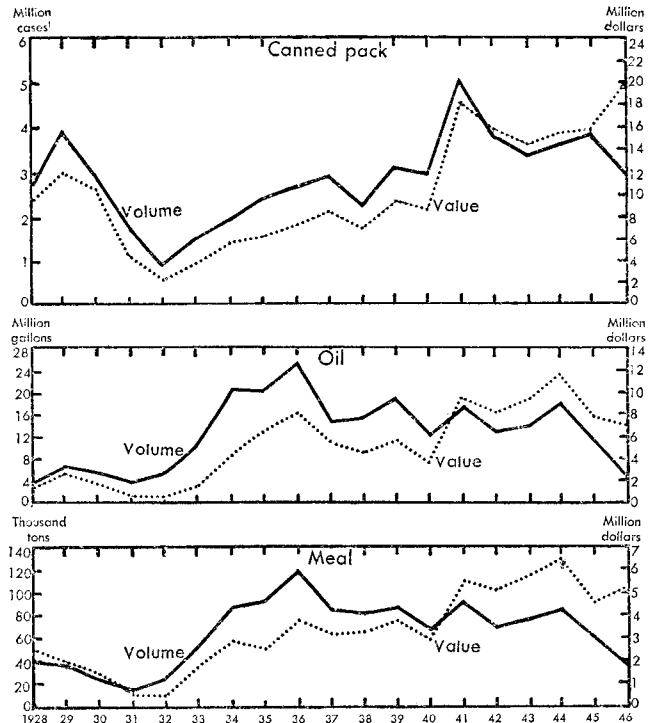
The number of sardine canneries (most of these are also equipped to can mackerel, tuna, and other fish) as well as the number of reduction plants has been increasing over the past two decades. The number of plants canning sardines was 28 in 1928, 31 in 1938 and 42 in 1946. Also their capacity increased relatively more than their number. The number of reduction plants which operated increased during the same period in the following way: 30, 60, and 109. The average yield of both canned sardines and of oil per ton of sardines varies both by season and by area depending on the size and quality of fish.

The tuna fishery

During the period 1928 to 1945 the tuna and tuna-like fishes contributed on the average 10.8 percent of all fish and shellfish landed in California. Owing, however, to the relatively high value of this type of fish, it accounted for an average of 41 percent of the value of total landings, ranging from 30 percent in 1929 to 55 percent in 1940. Because of the great increase in the catch of tuna during 1946 and 1947, the high prices received for them, and the failure of the sardine fishery, the tuna fishery's share in the value of total landings was 56 percent in 1946 and probably more than 60 percent in 1947. Thus the tuna fishery has become by far the most important component in the whole fishery industry of California.

There are five different types of tuna (belonging to the mackerel family—Scombridae) which are caught in large quantities by California fishermen: albacore, yellowfin,

SARDINE PRODUCTS AND THEIR VALUES



¹ In standard cases of 48 one-pound cans.

Source: Fish and Wildlife Service of the United States Department of the Interior. These figures, unlike the State figures (which do not contain information of value), are on the basis of calendar years. The Fish and Wildlife Service figures on the Pacific Coast sardine (pilchard) pack combine data for California and Oregon, but Oregon's share is negligible.

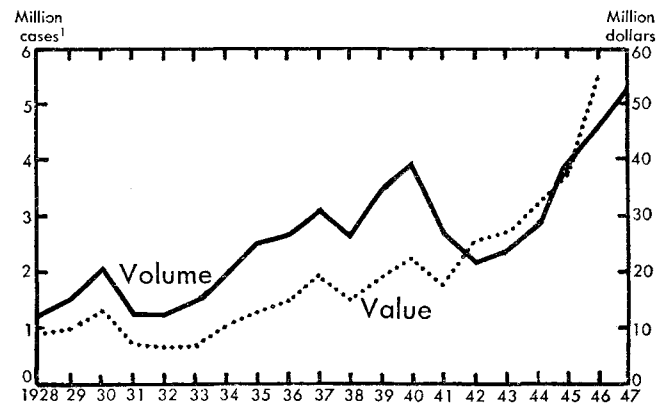
bluefin, skipjack, and bonito. But according to Federal law, only the first four types can be labeled and marketed as tuna. From the industry's point of view, a member of the jack family (Carangidae) called yellowtail should be included in this group because it is caught by tuna fishermen and processed by tuna packers, and serves as a tuna substitute. Because of this fact yellowtail is included in our tuna statistics. The differences in value of these various types of tuna and tuna-like fishes are indicated by ranges existing soon after the expiration of OPA legislation in the fall of 1946. The following were then prices paid per ton of round fish landed at cannery docks: albacore \$410, yellowfin \$240, bluefin \$230, skipjack \$220, bonito \$195, and yellowtail \$145. These differences in price are, however, only a general indication of quality differences, as sizeable changes in demand and supply affect these price spreads.

Landings of tuna and tuna-like fishes (including yellowtail) rose from 65 million pounds in 1928 to its peak of 260 million pounds in 1947. Value increased from \$3.9 million in 1928 to \$25.6 million in 1946. Because of the large increases in catch and in prices in 1947, the value in that year showed a further large increase, but details on value are not yet available.

Throughout the period 1928-46 the catch of yellowfin tuna, as shown in the accompanying table, accounted for somewhat over 50 percent of the total. The catch of the

in the fresh fish market. Offal is used for the production of oil and fish meal. Unlike sardine and salmon, tuna is caught and packed throughout the year, although the production peak is in the summer. Considering the role of the tuna fishery in Southern California and the fact that the sardine failure in that area was not complete, the position of the fishery industry in Southern California during the past two or three years has been satisfactory, while in the San Francisco and Monterey areas, where the industry is based principally on sardine exploitation, the situation has been extremely critical.

TUNA AND TUNA-LIKE FISHES: PACK AND ITS VALUE



¹ In standard cases of 48 half-pound cans.

Source: United States Department of the Interior, Fish and Wildlife Service.

PERCENTAGE DISTRIBUTION OF CATCH OF VARIOUS TYPES OF TUNA AND TUNA-LIKE FISHES
(annual averages in millions of pounds)

Period	Total catch	Albacore	Yellowfin	Bluefin	Skipjack	Bonito	Yellowtail
1928-32	76	0.4	52.4	12.6	26.7	4.3	3.6
1933-37	123	0.9	57.5	12.3	19.9	4.6	4.8
1938-42	153	4.6	55.0	9.4	22.7	4.6	3.7
1943-46	160	12.4	51.1	11.4	20.8	1.8	2.5

Source: Data until 1942 from the U. S. Department of the Interior, Fish and Wildlife Service, *Fishery Statistics of the United States*, annually; for later years from the Service's various mimeographed reports on current fishery statistics.

high-priced albacore has shown a relatively large increase, while the catch of lower-valued types either fell or kept relatively stationary. In 1947, the catch of both bonito and yellowtail greatly increased, while that of albacore fell. This year, however, the albacore catch through September has already reached 35 million pounds, a figure more than 2½ times the catch for the entire year 1947.

As considerably more than half the catch of tuna and tuna-like fishes comes from the waters off the Latin American coast, and the remainder from Southern California waters, tuna packing is concentrated in Southern California and is the mainstay of the fishery industry of that region. San Diego and Terminal Island are the two main landing ports, and plants located in those areas pack practically the whole output. About 25 plants canned tuna in California in 1947. Concentration appears to be greater in tuna packing than in any other important fishery industry, as it is reported that over 90 percent of the pack is put up by four companies.

The overwhelming portion of the catch of tuna and tuna-like fishes is canned and only a small quantity is sold

The tuna pack, as is indicated in the accompanying chart, has increased more than fourfold in the past 20 years. Judging from the results through the end of August 1948, when this year's pack stood at 4,029,597 cases as against 3,741,879 cases during the same period of last year, this year may well establish a new record.

The mackerel fishery

Next to tuna and sardines, the most important fish species for canning in California is mackerel. A small part of the catch is sold in the fresh fish market or salted. There are two types of mackerel, the Pacific mackerel and the jack mackerel.¹ Both species are caught almost exclusively in Southern California. The difference in quality is indicated by the spread in their prices at the beginning of the season in August 1947, Pacific mackerel selling for \$60 and jack mackerel \$45 a ton. The catch of Pacific mackerel between 1928 and 1945 averaged 70 million pounds annually, and brought in an average of \$840,000 a year. For the same years the catch of jack mackerel was negligible, averaging 4 million pounds annually and bringing to the fishermen an average return of only \$61,000 a year.

In 1946 the catch of Pacific mackerel was 54 million pounds, and in 1947 it fell to 47 million pounds. The catch of jack mackerel which was only 15 million pounds in

¹ Known until last year as horse mackerel. The name proved to be a great impediment in the marketing of this product in the domestic market so that the bulk of the pack had to be exported. At the urging of the industry, the Food and Drug Administration early this year allowed the product to be labeled "jack mackerel," but the label must contain also the Latin name of the species *Trachurus Symmetricus*.

1946 rose to 129 million pounds in 1947. As pointed out earlier, this was related partly to the failure of the sardine fishery and partly to the heavy demand for canned fish, both for the domestic market and for export.

The pack of both species has reflected the catch, averaging 823,000 cases of 48 one-pound tall cans between 1928 and 1945. The share of jack mackerel was small until 1947, when it rose to over twice that of Pacific mackerel.

Other types of fish used for canning

In addition to tuna, sardines, and mackerel, small quantities of many other types of fish and shellfish are packed in California. Among these are sole, shad, barracuda, anchovies, squid, clams, and crab. Since the failure of the sardine fishery, which coincided with a great demand for canned fish, the fish canning industry has begun to pay more attention to the canning of fish types which were formerly neglected.

The catch of anchovies, which averaged 2.5 million pounds between 1941 and 1946, rose to 18.9 million pounds in 1947. The catch of squid, which between 1941 and 1945 averaged 7.5 million pounds, rose to 38 million pounds in 1946 when a good market for canned squid existed, but went down to 14.5 million pounds in 1947 as a consequence of reduced government buying for relief exports. A small amount of Pacific herring was also canned experimentally in 1947 and considerable quantities in 1948. The pack of these various fishes since 1944 is shown in the accompanying table. The main market for all these products is abroad, especially the Far East.

PACK OF SQUID, ANCHOVIES, AND HERRING
(in cases)

	Squid ¹	Anchovies ²	Herring
1944	143,222	.. ³	.. ³
1945	184,141	.. ³	158 ³
1946	643,843	1,550	.. ³
1947	229,967	186,415	9,804
1948 (Jan.-July)	378,258	93,824	.. ⁴

¹ Cases of 48 1-pound oval cans, except that the pack of 1944 contains 9,115 cases and the pack of 1946 contains 24,946 cases of other sizes of cans.
² Cases "as they go" but consisting largely of 48 8-ounce cans.
³ No recorded pack.
⁴ Not yet available.

Species sold in the fresh fish market

There are a great number of species exploited in California which are sold almost exclusively in the fresh fish market. Among them the most important are Chinook salmon,¹ various types of sole, swordfish, barracuda, Cali-

¹ For a long time California packed no salmon although it was the pioneer in this industry (1864), but part of the catch was shipped out of the state for canning elsewhere (mostly in the Columbia River area). In the last two years two plants have canned salmon, but produced only about 4,600 standard cases in 1946 and 12,500 cases in 1947.

fornia halibut, seabass, and rockfishes. The average annual catches and average value to fishermen in selected periods of the three most important of these species were as follows:

	1928-45		1941-45		1946-47 ¹
	Catch (million pounds)	Value (thousands)	Catch (million pounds)	Value (thousands)	
Salmon	5.9	\$623.8	8.1	\$1,256.8	12.5
Sole	8.0	382.7	5.0	266.0	11.4
Rockfishes	5.2	218.7	5.4	267.4	9.8

¹ Value figures not yet available.

The average annual catch of salmon during 1941-45 was considerably higher than for the 18-year period 1928-45; the catch of rockfishes increased only slightly and the catch of sole was lower. This development of the catch of sole and rockfishes is to be explained essentially by the fact that a large number of fishermen and boats fishing earlier for these species shifted to the much more profitable shark fishery. But in 1946 and 1947 the catch in all three of these fisheries increased greatly.

It is interesting to note that the catch of rockfishes for filleting in California has increased relatively little in recent years, while in both Oregon and Washington it has become an important fishery.

Shellfish

As stated earlier, shellfish production plays only a minor role in California's fisheries. The most important species are crab, abalone, pismo clam, and squid. Squid, because of its large use for canning in recent years, has been treated earlier. Between 1928 and 1945 crab contributed approximately 40 percent of the total value of the shellfish catch. During the past two years its catch was almost three times as high as the average for the preceding 18 years.

The shark fishery

One of the most interesting developments in the California fishery industry in recent years has been the tremendous increase in the catch of sharks (including grayfish) as a consequence of newly-created demand for shark liver for preparation of vitamin A products. The most coveted species is the soupfin shark, but from the falling catch in the last few years it seems to be already largely depleted. Between 1928 and 1937 the value of the shark catch in California averaged \$11,500 annually. In the following three years it averaged \$254,000, and during the war years 1941 to 1945 it rose to an average of \$1,360,000 or 4.5 percent of the value of the total catch of fish and shellfish in the state.

REVISION OF PETROLEUM INDEXES—TWELFTH DISTRICT

BEGINNING with the September issue of the MONTHLY REVIEW, revised indexes of crude and refined petroleum production are being published by this bank. The two indexes are presented on the accompanying chart. During the war both crude and refined petroleum production increased steadily and surpassed all previous peaks in mid-1945. Following the end of the war, both indexes

declined sharply, but since early 1946 they have risen steadily in response to record peacetime demand for petroleum products. The crude petroleum index passed the 1945 peak and reached an all-time high in June 1948. Concurrently the refined petroleum index increased to a point not far below the 1945 peak. Since 1941 the refined petroleum index has been quite consistently above the crude

petroleum index. This difference reflects the fact that a smaller proportion of total crude production has been shipped out of the District in recent years because of the increased demand for refined products within the area. Between 1926 and 1942 there was little change in the relative amounts of crude run through the local refineries and of crude shipped outside the District. Prior to 1926 a considerably larger share of the crude produced here was refined elsewhere.

The base of both indexes has been shifted from 1923-25 to 1935-39. Besides the adjustment to the 1935-39 base, the coverage of products has been extended and the use of weights abandoned in the revised refined petroleum index. Prior to this revision the index included four major categories of refined products: gasoline and naphtha distillates, kerosene and kerosene distillates, lubricating oils, greases and distillates, and fuel oil residuum. Each category was weighted by the average value added during 1923-25. Because of the difficulty in obtaining recent weights that would satisfactorily measure the relative importance of each of the wide variety of refined petroleum products, it was decided at this time to use total "net refined production." That is, all refined petroleum products, including gas and diesel oil, asphalt and road

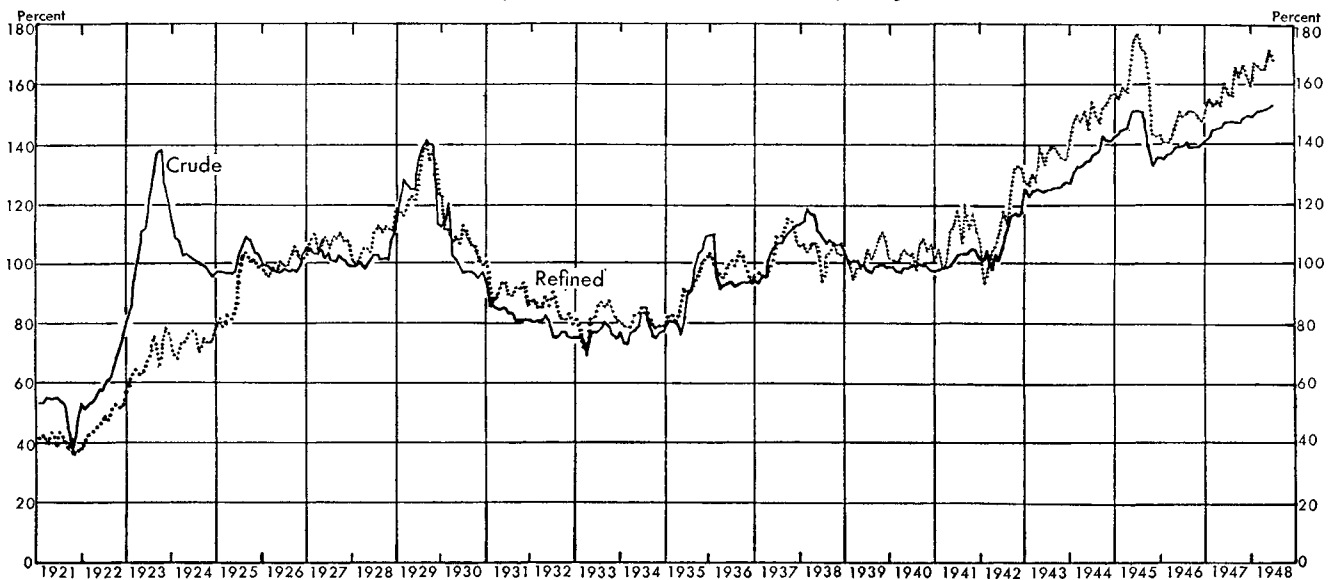
oils, and other minor products, in addition to those listed above, are now included on a straight volume basis in the index. Refining processes have become considerably more elaborate and intensified in recent years, and it must be recognized that an unweighted index does not adequately reflect the output of new and improved products associated with these recent technological improvements.

The production data used for both the crude and refined petroleum indexes are compiled and published by the Bureau of Mines in the monthly report, *The Petroleum Situation in the Pacific Coast Territory*. This publication covers total crude and refined production for California, Oregon, Washington, Arizona, and Nevada. The data used in compiling both the crude and refined petroleum indexes are reported by the Bureau of Mines in terms of daily average production, and both indexes are developed on this basis.

The revised indexes were inspected for evidence of seasonal patterns, but the amplitude of seasonal fluctuations in both crude and refined production was so small that adjustment for seasonal variation would be of little significance. Consequently both indexes are published without adjustment for seasonal variations.

PETROLEUM PRODUCTION, CRUDE AND REFINED—TWELFTH DISTRICT, 1921-48

Indexes not adjusted for seasonal variation. 1935-39 daily average = 100



BUSINESS INDEXES—TWELFTH DISTRICT¹
(1935-39 average = 100)

Year and Month	Industrial production (physical volume) ²								Total mfg employment ⁴	California factory payrolls ⁵	Car-loadings (num-ber) ²	Dep't store sales (value) ²	Dep't store stocks (value) ⁶	Retail food prices ^{3,6}
	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	88	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	161	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														
July	140	148	156	184	90	168	126	252	181	397	141	331	273	196.5
August	142	148	166	185	96	164	125	252	183	407	141	353 _r	251	197.9
September	143	147	162	193	93	168	123	259	184	413	139	345	264	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	161	216	109	157	101	274	187	406	131	339	388	211.6
April	124	152	166	216	110	164 _r	116	275	184	396	130	362	386	216.0
May	122	152	172	202	102	164 _r	108	263	180	406	123	364	347	217.6
June	128	153	168	196	102 _r	165	115	266	185	424	134	372	335	216.6
July	134 _r	152	167	202	96	159	123	284	190 _p	440 _r	137	365	328	218.1
August	140	153	171	202	102	166	124	289	195 _p	455	141	383	302	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	+ 151	+ 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	+ 4	- 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										
August	4,879	7,353	8,462	5,903	- 48	+ 78	+ 124	- 23	2,078	323
September	4,967	7,364	8,600	5,924	- 87	+ 85	+ 172	- 10	2,095	326 _r
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	8,566	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

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.