

# Monthly Review



TWELFTH FEDERAL RESERVE DISTRICT

FEDERAL RESERVE BANK OF SAN FRANCISCO

October 1957

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# REVIEW OF BUSINESS CONDITIONS

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**B**USINESS activity in August remained at the high level that has prevailed in earlier months. Industrial production and retail sales continued at the July rate. Meanwhile, nonfarm employment, consumer incomes, and total construction outlays advanced to new highs. Some recent gains in employment and retail trade were lost in September, however, and as yet no real clarification of business trends has emerged. By late September, the absence of any clear evidence that a greater-than-seasonal fall upsurge had begun contributed to some erosion of business confidence. Stock prices continued the drop that began in July, eliminating most of the gain that had occurred since the beginning of the year. In another market that is also sensitive to swings in business sentiment, the prices of raw industrial commodities continued the decline that began in early August.

While it remains true that business activity fluctuates much less than business expectations over short periods of time, several developments have provided cause for concern. New orders received by manufacturing firms have been declining. Although shipments in July were the highest since February, manufacturers' sales have shown weakness also. At the same time, the book value of inventories held by manufacturing firms rose further in July, and most of the increase was centered in stocks of finished goods. A portion of recent additions to inventories thus may have been involuntary. Continued weakness in new orders and sales may necessitate production cutbacks in some manufacturing lines in the future.

To some extent business confidence may have been affected by the recent course of monetary policy, including the August increase in the discount rate and the firmness of official statements concerning the problem of rising prices. The business community apparently expects no significant increase in the supply of credit in the immediate future.

Business expectations may also have darkened with the recognition that two of last year's

important expansionary forces—increases in defense expenditures and in outlays for plant and equipment—have disappeared. Investment in new plant and equipment in the fourth quarter is now forecast to remain at the estimated third quarter level. In conjunction with the leveling in outlays for plant and equipment, expenditures for construction of industrial and commercial buildings have been running below year-ago levels since June. Moreover, new orders for machine tools have fallen sharply during the first eight months of 1957.

The effects of cutbacks in defense spending are also evident. Production stretch-outs and contract cancellations involving both missiles and aircraft are now being felt by firms which do subcontracting for aircraft companies as well as by the aircraft companies themselves. Net new orders received by the aircraft industry during the second quarter were down 28 percent from those of the first quarter.

Prospects are that another component of Gross National Product—Net Foreign Investment—will also decline. Foreign demand for goods and services produced in the United States rose sharply following the Suez crisis and unexpectedly continued to provide stimulation to the economy during the first half of 1957. Foreign exchange reserves of some countries, particularly dollar balances, have shrunk in recent months—a situation that is likely to exert a dampening influence on United States exports in the future.

## *Consumer spending steadies at high level in August*

Although expenditures of business firms and the Federal government have shown signs of tapering off or declining, consumer spending at retail stores rose a little more than 4 percent from April to July. In August, sales held at the record July level, but a 2 percent drop occurred in September, according to advance reports. Even so, retail sales have more than kept pace with the rise in personal income for the year to date. Almost all of the gain, however, has been in sales of nondurable goods.

The number of new cars sold in August was reported to be up 2 percent from August 1956, one of that year's best months. Cars have continued to move well in September, as sales are estimated to have been as much as 20 percent above last year's low September level. Heartened by the favorable sales picture, manufacturers are reported to be raising fourth quarter production goals for 1958 models.

Retail sales are still generally at a high rate and if the September dip proves temporary, and especially if automobiles continue to sell at a pace faster than in 1956, the fourth quarter outlook may be brighter than current business sentiment would have one believe. Even allowing for price increases that have occurred, continued expansion in retail sales would obligate retailers to increase inventories. Consumers, in fact, may provide the increase in aggregate demand necessary for an advance in business activity in the fourth quarter.

A small percentage increase in consumer expenditures can have large significance, for such expenditures normally account for about 64 percent of Gross National Product.

In this brief assessment of expansionary and contracting forces, recent developments in residential housing activity merit attention. Housing starts have turned upward since April, reaching a seasonally adjusted annual rate of more than a million units in August. Should this trend continue, outlays for residential construction may also turn up, reversing a decline that has exerted a depressing influence on Gross National Product since the final quarter of 1955.

#### ***Business activity slackens in the Twelfth District***

According to most indicators, business activity in the Twelfth District failed to advance from July to August. Department store sales and construction activity declined moderately during the month. In addition, lumber markets have weakened further, and steel production showed no gain. A minor drop also occurred in total nonfarm employment, though this was largely attributed to work stoppages in the construction industry.

Total nonfarm employment in District states receded slightly from July to August after sea-

sonal adjustment. Nearly all of the decline was concentrated in manufacturing and construction, which recorded losses of 1 and 3 percent, respectively. Gains since July measured nearly 1 percent in the case of trade and service industries, while smaller advances were reported for employment in government and finance. The number of workers in mining and in transportation and public utilities showed almost no change.

#### ***Strikes contribute to employment drop***

It is estimated that employment in Southern California was reduced about 20,000 by a construction strike that began before the July survey week. The strike widened in August, affecting perhaps as many as 35,000 workers by the middle of the month. Although it is not possible to say whether construction employment would otherwise have increased during July and August, the trend of building permit activity suggests that the pre-strike employment decline (after seasonal adjustment) might have continued.

A drop of 8,000 in aircraft employment between July and August and smaller-than-seasonal gains in food processing and lumbering were not completely offset by employment advances registered in electrical machinery and other manufacturing industries. A portion of the decline in manufacturing employment since June was due to a work stoppage in metalworking industries in the San Francisco metropolitan area. In general, the District employment picture continued to be characterized by reductions in the number of workers in commodity-producing industries that are approximately offset by employment gains in service, trade, transportation, and government.

#### ***Building permit activity recedes***

The value of total building permits issued in the Twelfth District in August was about 4 percent less than in July, according to advance estimates. In contrast to the usual pattern of past months, residential valuations increased 17 percent from the July level, mostly in multi-unit structures. Nonresidential valuations slipped by nearly 21 percent from the July level. Through August, the value of total permits is about 9 per-

cent less than those for the first eight months of 1956. Nonresidential valuations are off 3 percent, while residential authorizations show a value drop of 13 percent from the 1956 pace.

Considerable attention has been directed toward the liberalization of FHA terms in early August. In general, down payments were lowered to attract buyers and the interest rate was raised to attract lenders. However, a ceiling of 2½ percent was also placed on discounts, which were being used by financial institutions to obtain the going rates of return in areas where the local market rates of interest were higher than the maximum permitted on FHA mortgages.

Discounts vary by region and generally run larger in areas such as the West and the South that must "import" mortgage capital from individuals and organizations in Eastern cities. It is believed, therefore, that the 2½ percent ceiling placed on discounts may prevent an increase in the flow of mortgage funds into the Twelfth District from Eastern sources. Surplus capital may be expected either to remain in Eastern mortgage markets where discounts are traditionally closer to the 2½ percent ceiling or else be channelled into more profitable, non-mortgage uses.

#### ***District production activity slackens***

Steel production in the Western district (which includes Colorado) remained at about the July level of 91 percent of capacity in August. For the entire nation, steel reversed a six-months decline and rose about seasonally from 79 percent of capacity in July to nearly 82 percent in August. Some slackening in the demand for structural steel was reported in District markets, though this may have been connected with the construction strike in Southern California.

Output of Douglas fir and western pine in the four-week period ending September 14 recorded losses of 9 and 21 percent, respectively, from the previous four-week period. A decline of about 5 percent would normally occur because of the Labor Day holiday, however. Declines in new orders for both types of lumber indicate that activity this fall may show a greater-than-seasonal downward movement in the lumber industry. Redwood production in August rose above July's

vacation-depressed level, but remained about 6 percent below the May-June average.

Reports from the Pacific Northwest indicate that several pulp mills have closed because of a weakening in the demand for paper and other products. In the Douglas fir plywood industry, plagued with temporary over-expansion of capacity as is the pulp industry, output held up well in September. Price increases for plywood have been announced by several mills, but these may be difficult to maintain if closed mills are encouraged to re-open.

Also in the Pacific Northwest, power shortages in the Bonneville system forced the cancellation of interruptible power in the early part of September. One aluminum producer has closed two potlines while others are using provisional power that they may have to replace later with more expensively generated energy.

#### ***Retail trade lags in the Twelfth District***

Sales at District department stores fell about 2 percent from July to August after adjustment for seasonal variation and differences in the number of trading days. They were also nearly 1 percent below sales in August a year ago. Automobile registrations in California during August dropped 18 percent from those of July. For all District states, however, sales through July were running about 1 percent ahead of sales for the first seven months of 1956.

#### ***Loans rise seasonally at District reporting member banks***

Loans outstanding at weekly reporting member banks jumped \$150 million in the four-week period ending September 25. This compares with a much smaller gain of \$49 million in the previous four-week period and an advance of \$123 million in a similar period in 1956. For the year so far, however, loans outstanding have grown only about one-fourth as much as during the first nine months of 1956. The September increase in borrowings can be associated with the corporation income tax payment due on the fifteenth of the month. This year, 15 percent of estimated 1957 taxes were due. A year ago the quarterly payment amounted to only 10 percent of estimated tax liabilities.

Most of the recent gain in loans outstanding was centered in the commercial and industrial category. Borrowings of food and liquor processors registered a normal seasonal rise of \$73 million. Smaller increases of \$11 million, \$7 million, and \$5 million were recorded, respectively, for public utilities, metal producers, and sales finance companies. These companies reduced indebtedness in September 1956.

"Other" loans—chiefly those to individuals for personal expenditures—rose by \$20 million, compared with a fall of \$10 million in the same period in 1956. Borrowings of brokers and security dealers showed an expansion of \$12 mil-

lion. Real estate loans outstanding registered no increase this September, in contrast to a gain of \$31 million a year ago.

Also in the four-week period ending September 25, demand deposits at weekly reporting member banks rose \$192 million while time deposits registered a gain of \$54 million. This deposit growth compares favorably with increases of \$187 and \$10 million in the 1956 period. Net holdings of United States securities were reduced \$49 million this year, however, in contrast to an increase of \$21 million in the September four-week period last year.

## Fruit and Vegetable Canning—Review and Prospects

THE Twelfth District fruit and vegetable canning industry is a vigorous, thriving enterprise. Since World War II it has expanded briskly, in response to the basic growth stimulants of an increasing national population and a high and rising level of personal income. A secondary stimulant has been the increase in per capita consumption of canned vegetables; that of canned fruits is stable, while fresh produce consumption per person is declining. In addition, the canning industry of this District appears to be supplying a larger share of the market for some of the major canned products than it did several years ago.<sup>1</sup>

Although supporting influences underlie the sharp increase in the volume of fruits and vegetables canned in the District during the postwar period, the industry apparently entered the 1957 marketing year from a position of overexpan-

sion.<sup>2</sup> For the past two years, particularly in the 1956 season just completed, District canned fruit and vegetable supplies proved to be substantially in excess of demand at current prices. This situation will be discussed after a brief review of the past two decades of growth in the District canning industry.

### *Twelfth District canning has grown*

The industry's growth is shown in Charts 1 and 2. It is apparent from Chart 1 that the historical increase in vegetable processing has been primarily an expansion of canned tomatoes in various forms, including juice, paste, catsup, and other commodities. In 1956, tomatoes in all forms were nearly two-thirds of all the vegetables packed in the District and were over 40 percent of total fruit and vegetable production.<sup>3</sup> The chart also shows that sizable year-to-year fluctuations in vegetable packs largely reflect changes in tomato products. These products have followed two complete five-year production cycles, with peak years in 1951 and 1956, since the end of World War II. In each cycle, following a peak year there have been two years of reduced output,

<sup>1</sup> A good part of the fruit and vegetable canning industry is concentrated in the Twelfth District, where 32 percent of the industry's \$2.3 billion in shipments originated in 1954, according to the United States Department of Commerce, Bureau of the Census, *Census of Manufactures, 1954*, reporting on the Standard Industrial Code 2033, Fruit and Vegetable Canning Industry. In particular, the Twelfth District is the center for canned fruit and canned vegetable production, with less emphasis on other important industry products such as soups, baby foods, jams, jellies, and preserves. About three-fourths of District industry shipments in 1954 were of canned fruits and vegetables alone. This was 58 percent of the nation's \$876 million total value of these products. Because of production increases since then, the value of industry output both nationally and in the District is substantially higher at present than it was in 1954. The frozen foods industry is excluded from this article, which deals only with the fruit and vegetable canning industry.

<sup>2</sup> The marketing season for items packed in one year extends into the succeeding calendar year. Items packed in 1956, for example, are marketed during the latter portion of 1956 and in 1957 until 1957 crops become available for canning. For most major products the season begins and ends around mid-year.

<sup>3</sup> Vegetables are in terms of actual cases; fruits, in terms of 24 No. 2½ cans per case.

then a three-year period of rising production culminating in the next peak. Since the outlook is for lower production in 1957, the crest of this second cycle apparently was reached in 1956, when output was 30 percent greater than in 1951. Oversupply, the chief characteristic of the present situation as canners entered the 1957 marketing year, appears to be a recurrent pattern, on the basis of postwar experience.

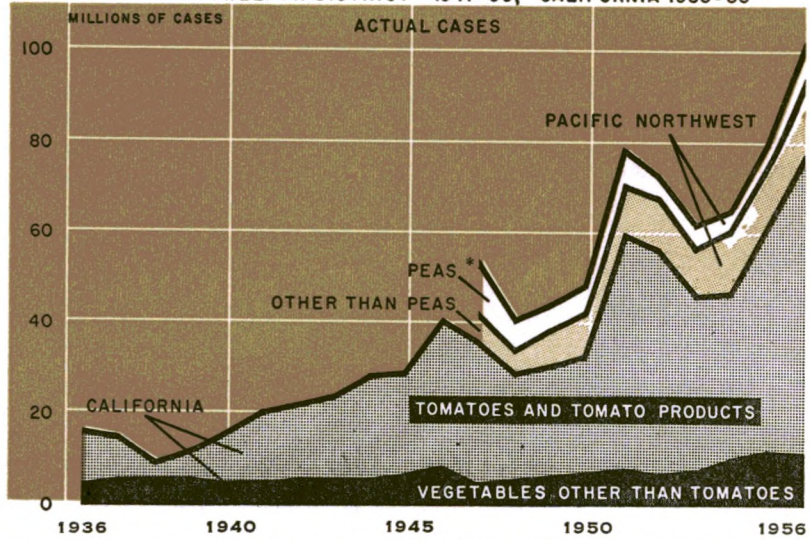
Canned fruit production has also risen over the past two decades, as shown in Chart 2. Cling peaches have always been the most important single fruit product. Record production of cling peaches in the past two years contributed heavily to the present condition of oversupply. Total District output of canned fruits in 1956 was 10 percent larger than the record achieved in 1955. The basic yearly fluctuation in fruit output, as shown in the chart, may stem from the tendency of fruit trees to alternate scanty and abundant bearing years. The past two seasons are a significant exception to this pattern. Increases in the volume of fruit packed have been more moderate than for vegetables, and it is primarily the canned vegetable sector that is gaining a larger share of the market for the District canning industry.

**District canners supply a rising share of the market**

The Twelfth District is the principal fruit and vegetable canning region, and is supplying an even larger share of the expanding market for these products than it did several years ago. The value added by manufacture in District canneries increased approximately 30 percent between 1947 and 1954, after allowing for price changes,<sup>1</sup> and has increased even further since

<sup>1</sup> United States Department of Commerce, Bureau of the Census, *Census of Manufactures, 1947, and 1954*: Standard Industrial Code 2033, Fruit and Vegetable Canning.

CHART 1  
TOTAL VEGETABLE PACKS<sup>2</sup>  
TWELFTH DISTRICT 1947-56, CALIFORNIA 1936-56



<sup>1</sup> Includes vegetables canned in California, Oregon, Washington, and Idaho, plus a small volume canned in Montana.

<sup>2</sup> Data not available prior to 1947.

Sources: Canners League of California; Northwest Canners and Freezers Association.

1954, as indicated by the sharp increases in physical output during the past two years. In 1956, District canners put up a record volume of vegetables, accounting for almost half the country's output. This represents a slight gain in the District's share over 1955 and a considerable increase in this share over the last decade. Increased packs of tomatoes and tomato products have played an important part in this increase.<sup>2</sup> Fruit canning<sup>3</sup> has also expanded but less sharply. District output, excluding citrus fruit, has increased 43 percent in the last ten years, which is somewhat more than the 37 percent increase nationally.

Although the District canning industry is growing, like most industries it appears to be subject to production cycles. Peak years in the cycles for fruit and vegetables coincided in the 1956 season, with the result that, in almost every important pack, substantially more was produced than could be sold at prevailing prices.

<sup>2</sup> Stock and movement data for tomatoes and tomato products are available only for California, but California produces nearly all of the District output of these products.

<sup>3</sup> In this article "major canned fruits" includes peaches, pears, fruit cocktail, apricots, plums, and sweet cherries.

**Supplies at record high for 1956 season**

In review, the 1956 season was the leading year in District fruit and vegetable canning history, in terms of production, supplies, and sales. Production of both fruits and vegetables was larger than ever before, and total supplies were augmented by sizable quantities left over from the previous season. Movement of supplies from District canners' hands was the highest in history. Profits, however, were generally lower than in 1955 because of the downward pressure on prices resulting from increased supplies; at the same time, canners' costs also reached their highest historical level. The industry's leading firms complained, in their annual reports, of the effects of this "cost-price squeeze" on profits, although some firms made the general qualification that the primary cause of reduced profits lay in losses from their frozen foods operations.

Large packs were recorded for most fruits and vegetables nationally, thus increasing the competition among products. In the District the largest increase was in packs of cling peaches, tomatoes, and green peas. District canners produced 160 million cases of fruits and vegetables in 1956, a jump of 19 percent over the 134 million cases turned out in 1955. Canners contracted for large acreages, and ideal growing conditions resulted in the bumper crops of tomatoes, green peas, and cling peaches. Together these crops accounted for 24 million cases of the 26 million-case increase.

The vegetable pack was 21 million cases or 26 percent larger than in 1955. Vegetable stock figures are only available for California, where the total supply (the amount packed plus carryover from the previous season) of asparagus, spinach, and tomatoes and tomato products was 27 percent above 1955. The total pack of fruits was 10 percent above that of 1955

—an increase of 5 million cases. Stocks left over from 1955, principally of cling peaches, swelled the total supply of fruits to about 16 percent above the previous year.

These figures indicate that movement of fruits would have had to expand by 16 percent and that of vegetables by 27 percent in order to have disposed of the increase in supplies on hand for the 1956 season.

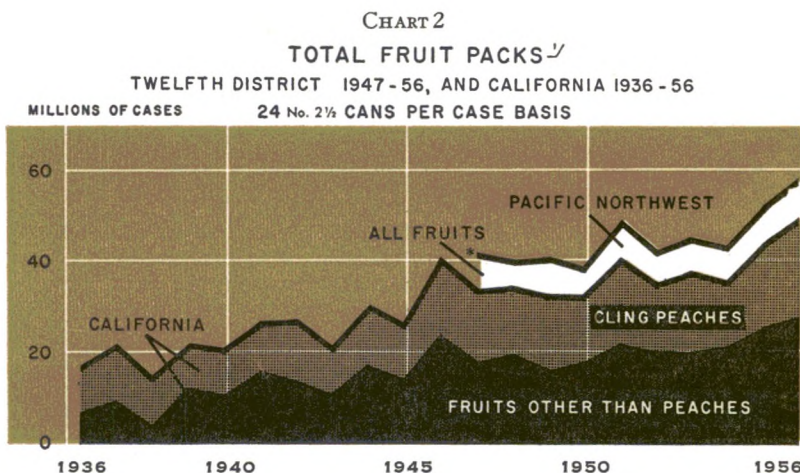
**Record sales achieved with lower prices . . .**

After a year of strenuously competitive marketing, a 5 percent larger volume of fruits and an 11 percent larger volume of California tomatoes and tomato products were moved by District canners than in 1955. The increase in both of these commodity groups surpassed the average annual increase of recent years.

Movement increased to both domestic and foreign markets. Domestic demand remained strong with the continued increase in consumer income and population growth. Exports of canned fruits and vegetables, although a small fraction of total disposal, were the highest for any peace-time year.<sup>1</sup> The four leading fruit and vegetable (excluding soup) canners of the nation<sup>2</sup> all experi-

<sup>1</sup> This is on a fiscal year basis, which coincides with the general marketing season for the canning industry.

<sup>2</sup> Libby's, California Packing Corporation, Stokeley-Van Camp, and H. J. Heinz.



<sup>1</sup> Includes fruit canned in California, Oregon, Washington, and Idaho, plus a small volume canned in Montana.

\*Data not available prior to 1947.

Sources: Canners League of California; Northwest Canners and Freezers Association.

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enced record dollar sales for the year, averaging about 7 percent above sales in 1955.

Sales of those fruits in heavy supply were also stimulated by lower prices. For example, California f.o.b. price quotations for cling peaches show that a 4 percent decrease in price from 1955 was associated with an 8 percent increase in movement. Prices of fruit cocktail, the second largest District fruit pack, also fluctuated around lower levels than in 1955. Compared with that year's high and low prices, the highest prices were 5 percent lower, and the lowest prices of the season were down 2 to 5 percent. Movement, on the other hand, increased 10 percent or nearly a million cases above the former record in 1955. Prices quoted for Bartlett pears, however, remained unchanged throughout the 1956 season from the top price in the previous season. Pears were the only pack in heavy supply to experience reduced movement. Movement fell 4 percent although the year's supplies were 7 percent above a year ago.

Reduced prices of important tomato products undoubtedly played an important role in produc-

ing a total movement of California tomatoes in all forms of 55 million cases, up 11 percent from 1955. Cannery price quotations for whole tomatoes and tomato juice were lower throughout the season, but additional cuts were made in the latter part of the marketing year, the spring and summer months, when demand for canned food traditionally slackens.

**But market fails to clear**

Despite increased demand and selective price reductions, the movement of canned fruits and vegetables did not increase sufficiently to prevent an increased carryover of stock into the current season.

Nationally, canners' stocks of vegetables covered in the Department of Commerce report showed substantial gains from July levels a year ago. Their stocks of some items, such as corn and tomatoes, were over twice as large as in 1956. Canners' stocks of canned fruit also increased considerably from year-ago levels. Distributors' stocks are little changed from recent years, but this is not significant because distributors custo-

TABLE 1  
PRINCIPAL FRUIT AND VEGETABLE PACKS  
CALIFORNIA, OREGON, WASHINGTON, AND IDAHO,<sup>1</sup> 1951-56  
(in thousands of cases)

| FRUIT PACKS <sup>2</sup>           | 1951-52 | 1952-53 | 1953-54 | 1954-55 | 1955-56 | 1956-57 |
|------------------------------------|---------|---------|---------|---------|---------|---------|
| Peaches                            |         |         |         |         |         |         |
| Cling <sup>3</sup> .....           | 19,145  | 14,964  | 17,163  | 13,818  | 17,923  | 21,322  |
| Other .....                        | 3,106   | 3,433   | 3,150   | 3,697   | 3,989   | 5,669   |
| Fruit cocktail .....               | 9,003   | 7,489   | 8,228   | 9,074   | 9,809   | 11,033  |
| Pears .....                        | 6,215   | 6,003   | 5,185   | 7,475   | 7,849   | 8,437   |
| Apricots .....                     | 4,538   | 3,950   | 4,753   | 2,694   | 5,828   | 4,139   |
| Plums .....                        | 2,217   | 1,470   | 1,263   | 1,572   | 1,525   | 2,099   |
| Cherries, sweet <sup>4</sup> ..... | 804     | 1,130   | 976     | 858     | 1,254   | 652     |
| Apples and applesauce .....        | 792     | 925     | 1,335   | 1,380   | 1,472   | 1,596   |
| Other fruits and berries .....     | 2,896   | 2,732   | 2,848   | 2,995   | 3,223   | 3,220   |
| Total fruits and berries .....     | 48,715  | 42,096  | 44,901  | 43,563  | 52,870  | 58,168  |
| VEGETABLE PACKS <sup>5</sup>       |         |         |         |         |         |         |
| Tomatoes <sup>6</sup> .....        | 7,618   | 9,916   | 6,925   | 7,228   | 9,479   | 11,851  |
| Tomato juice .....                 | 11,504  | 11,610  | 10,600  | 8,850   | 11,325  | 16,299  |
| Other tomato products .....        | 31,625  | 26,372  | 19,006  | 21,162  | 29,862  | 38,029  |
| Peas .....                         | 7,490   | 6,757   | 6,452   | 5,075   | 4,100   | 9,428   |
| Beans, green and waxed .....       | 5,707   | 4,288   | 5,189   | 8,453   | 8,965   | 8,252   |
| Asparagus .....                    | 2,897   | 2,667   | 2,710   | 3,464   | 4,689   | 3,774   |
| Corn .....                         | 3,525   | 3,583   | 3,781   | 3,635   | 3,246   | 4,081   |
| Spinach .....                      | 3,304   | 2,591   | 2,271   | 2,387   | 3,207   | 3,165   |
| Beets .....                        | 1,405   | 857     | 994     | 1,121   | 1,309   | 1,438   |
| Carrots .....                      | 622     | 922     | 754     | 690     | 585     | 918     |
| Other <sup>7</sup> .....           | 3,333   | 3,899   | 4,178   | 3,651   | 4,119   | 4,971   |
| Total .....                        | 79,031  | 73,461  | 62,860  | 65,716  | 80,884  | 102,205 |

<sup>1</sup> Includes a small volume canned in Montana.

<sup>2</sup> 24-No. 2½ case basis.

<sup>3</sup> Spiced clings are included in "Other."

<sup>4</sup> Sour cherries are included in "Other."

<sup>5</sup> Actual cases.

<sup>6</sup> Includes the tomato juice pack in the Pacific Northwest.

<sup>7</sup> Quantities of specific vegetable items may be included in "Other" category if the pack is of minor importance in reporting area.

Note: Figures may not add to totals because of rounding.

Sources: Canners League of California; Northwest Canners and Freezers Association.



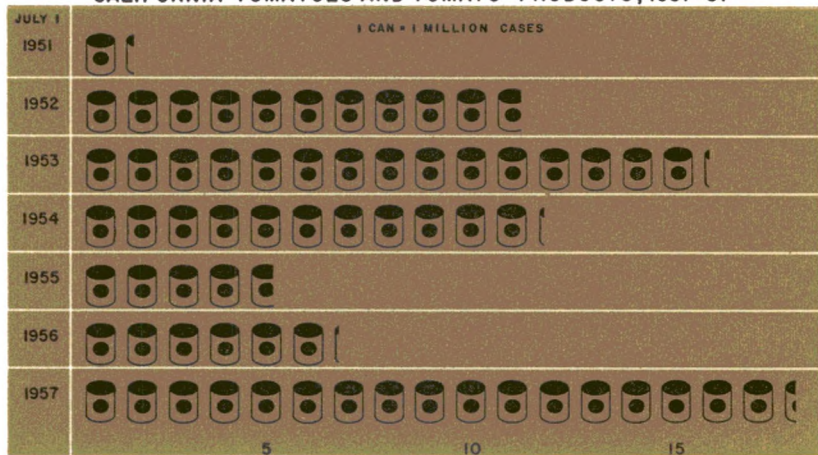
marily hold only short-term supplies, while the remainder of the canned items is held by canners themselves.

The national carryover of tomatoes, tomato juice, catsup, and chili sauce by canners was almost three times larger than a year ago. Despite the increase in canners' stocks in California, as shown in Chart 3, they were able to reduce their share of the national totals in these items from 53 percent last year to 49 percent in 1957. This reduction was largely the result of a smaller build-up of stocks of tomato juice in California.

That large supplies have had a depressing effect on prices is evident, and unless the forthcoming packs are substantially reduced, supplies will continue to exert downward pressure on prices. The depressing effect, however, may be enhanced or reduced, depending on who holds the leftover supplies. Prices did not fall as much as they might have, according to trade comments, because most of the supplies are in the hands of those best able to finance them, that is, the name-brand canners. Three of the leading companies whose fiscal years end near June 1 recorded an average 21 percent increase in inventories of finished goods over last year. In some cases, however, these inventory data also reflect a build-up in stocks of frozen foods.

How burdensome are these carryover stocks? This depends on the quantity to be canned in 1957 and the movement of canned fruits and vegetables. Steps have already been taken by the United States Department of Agriculture to take substantial quantities of some items such as cling peaches, freestone peaches, green peas, tomatoes, cherries, and green beans for the school lunch program. Further purchases for this program may be forthcoming. In addition, sizable shipments of cling peaches and fruit cocktail to the

CHART 3  
FLUCTUATIONS IN CARRY-IN STOCKS OF  
CALIFORNIA TOMATOES AND TOMATO PRODUCTS, 1951-57



Source: Canners League of California.

United Kingdom are expected under Public Law 480, an act enabling foreign nations to buy surplus goods (usually from CCC stocks) with their own currencies instead of with dollars. As for pack prospects, some important reductions are anticipated.

**Smaller tonnages will be canned in 1957**

Total District output in 1957 of canned fruits and vegetables will undoubtedly be smaller in aggregate than it was in 1956. Smaller vegetable crops will be harvested this year, according to latest USDA estimates. Total production of the major canning fruits is expected to be slightly lower, and measures have been taken to ensure reduction in the volume of some packs. The total vegetable pack will not be small, however, relative to that of recent years, and may not fall below the 1955 level—the second highest on record.

Latest forecasts indicate an over-all reduction of 21 percent in the output for processing of tomatoes, snap beans, sweet corn, and peas, owing to acreage cutbacks and generally lower yields. The canning tomato crop is expected to be one-quarter below that of last year, and that of green peas may be smaller by 14 percent. A slight offset to these reductions is the fact that the new California spinach and asparagus packs, which

have already been completed, are somewhat larger than they were last year.

A smaller fruit pack is also forthcoming, largely because the industry has employed control devices to reduce the volume of canned cling peaches and Bartlett pears. The 1957 pack of cling peaches will total about 18.1 million cases, according to an end-of-September trade estimate. Pack estimates have been lowered periodically throughout the season. Early crop conditions indicated that California peach trees might bear a substantially larger crop than even the record of last year. This was a matter of concern to cling peach canners and producers, in view of the record high carryover from the 1956 season. Enabling legislation is provided in the State of California permitting joint action on the part of cling peach producers and canners to curtail supplies for canning when it appears that they will unduly depress prices. As the commercial production of cling peaches is confined to California, it is possible to implement such action on a state basis with effective results. Under the authority of the California Cling Peach Marketing Order, a "green drop" program was adopted whereby 16 percent of the expected crop was eliminated before ripening. Further reductions were made through cullage and diversion of varying percentages of deliveries at the cannery to other uses. This latter control was dropped as harvest progressed and it became evident that brown rot disease and hot weather were making inroads on the crop. Present estimates put the 1957 pack 15 percent below that of 1956.

Bartlett pears apparently are being packed in smaller volume also, down about 20 percent according to late September trade estimates. The volume of pears for canning was reduced primarily by shifting larger amounts than usual to fresh market channels and by setting canning grade standards so that only top quality pears will be canned. In addition to the smaller expected output of cling peaches and pears, the California apricot pack, already completed, is 3 percent smaller than in 1956. Crop forecasts indicate a smaller output of purple plums this year. However, no reduction in freestone peach canning is indicated.

If present estimates are realized, the total supply of cling peaches available in the 1957 marketing season will be about the same as last year, and supplies of tomatoes and tomato products will be somewhat lower. However, supplies of tomatoes and tomato products would still be considerably above the quantity moved during the last season, and movement would have to show increases again this year in order to reduce supplies to comfortable levels. This process of readjustment may take more than one season, as past experience seems to indicate.

#### **Costs are still climbing**

Costs of labor, transportation, and many materials are continuing their upward trend. The only notable reductions this year are in prices paid to growers for some raw products.

One major District canner recently estimated that, compared with last year, the company's cost of tin plate has risen 7 percent; glass containers are up 6 percent; fibreboard cases increased nearly 4 percent; and labor costs have risen 3 to 3½ percent. Such increases are general throughout the industry.

Labor costs have risen steadily over recent years. In California, average hourly earnings in the fruit and vegetable canning industry have climbed 40 percent since 1949, slightly more than the rise in earnings for all manufacturing industries. Average weekly earnings have risen relatively more. A 5 cents per hour wage increase became effective in March this year, under the current 1956-59 contract between the California Processors and Growers Association and the Teamsters union. Average hourly earnings were higher in the first half of 1957 than in the same period a year ago, both in California and the Pacific Northwest.

Transportation costs will be as much as 12 percent higher than they were early in 1956. On August 6 the Interstate Commerce Commission granted railroad freight rate increases that provide for a maximum increase of 11 cents per hundredweight or 12 percent, whichever is less, for canned and frozen fruits and vegetables, effective as soon as legal forms are completed. It has been estimated by the Bureau of the Census

that 46 percent of canned foods are transported by rail. Thus, it is apparent that increases in transport rates stemming from the Commission's latest action will be a significant addition to canners' costs of doing business this year.

On the other hand, raw material costs are lower for some crops this year; but trade sources predict these reductions will not be sufficient to offset other increases in costs. Negotiations between growers and canners on the prices of some items have been delayed and prolonged. Growers of peaches and pears resisted price cuts in the face of expected lower volume demanded by canners, but canners obtained lower rates for these crops than they have paid during the past two seasons.

The contract price for California cling peaches has been established at \$62 per ton, plus allowances that bring the price to about \$65 per ton—compared with \$70 in 1956. Price negotiations were especially prolonged for pears, and in California the agreed price will yield an average return of about \$60 per ton, the lowest since 1952, and \$15 below the average in 1956. In Washington, growers finally accepted \$60 per ton for No. 1 grade pears, compared with \$90 per ton in 1956. Freestone peaches in California and Washington were also the focus of long bargaining. The California price appears to be \$45 per ton for Elbertas, compared with \$60 last year. Washington growers received \$65 for top grade Elbertas, down from \$72 last year.

Vegetable prices also reflect the influence of the large carryover from last season. Two prices will prevail for processing tomatoes. Early contracts for the 1957 crop called for the same prices that prevailed on last year's crop, \$22.50 per ton. Some later contracts were made for a lower price of \$20.00 per ton, a price which one source estimated covered one-fifth of the crop.

The price for green peas in the Pacific Northwest is 2 percent below last year, and California canners paid 2½ to 3 cents a pound less for asparagus than they did in 1956.

What about cannery profits for the 1957 season? Apparently some reduction from 1956 is in prospect. It does not appear likely that the higher level of costs will be more than offset by higher

prices for canned items and improvements in production efficiency. Some increase in price is anticipated at the retail level by the Department of Agriculture, particularly for vegetables. If prices should strengthen, however, only a portion of the rise may be reflected in prices at the cannery level as the higher railroad rates will absorb at least a part of the increase. In addition, sales will have to be pushed aggressively to duplicate the record volume moved from District canneries last year. Although profits prospects appear to be down from last year, recent events may strengthen these prospects considerably when their effects are fully assessed. For example, unusual growing conditions have reduced yields considerably in some cases. Tomato acreage, for instance, was adjusted downward in anticipation of large inventories at the beginning of the 1957 season. However, with the additional effect of a decline in yields, particularly in Eastern producing areas, output was reduced even more than was expected. Current estimates place the production of tomatoes for processing 24 percent below the output in 1956. Production estimates for cling peaches also have been revised downward in recent months. In just one month, between August 1 and September 1, crop estimates were reduced by about 6 percent. Such changes as these may well alter the attitude of canners about the large inventories that they have carried into the current season.

#### *Year of adjustment*

District canners entered the current season with large inventories of fruits and vegetables as a result of record production in the past two seasons. This is not a new experience for District canners as the situation occurs periodically from an overexpansion of production. Supplies were sufficiently large in 1956 to weaken prices for items important to District canners. To reduce inventories to more comfortable levels without further depressing prices, the most obvious action that canners could take would be to reduce the size of the 1957 pack from the output in the previous year. Some downward adjustment in the pack of principal items is suggested by crop production estimates.

As canners' costs are higher than in 1956, they would welcome some price increase in 1957 in response to somewhat lower supplies. The extent of the reduction in supplies, however, will probably need to be substantial to bring about much of a price increase. Sales were at an all-time high in 1956, partially as a result of selective price reduction for canned items. Strengthening prices could be expected to hold down the movement of canned goods, although domestic demand will probably continue at a high level during the 1957 marketing season. In addition, exports and purchases for the school lunch program will need to be sizable—a reasonable expectation from indications thus far received.

Fruit and vegetable canning is a competitive industry, although it is characterized by a moderate degree of concentration. Of the industry's shipments in 1954, 28 percent were made by the largest 4 companies; 38 percent, by the largest 8; and 50 percent, by the largest 20.

The canning industry, dependent as it is for its raw materials on agriculture, which is often troubled by year-to-year instability in production, has available to it certain stabilizing devices, which are particularly characteristic of the District industry.

The larger companies, by taking over inventories of canners who would otherwise have to cut prices drastically to move merchandise in a

period of oversupply, provide a degree of price stability for the industry as a whole. In addition, the system of state-enforced marketing orders, which in California apply at present to such major canned products as cling peaches, pears, and asparagus, enables producers and processors to regulate the quantity of raw materials processed by canners. The most notable success has been achieved with cling peaches. The ways in which producers and processors employed most of the devices available to them under the Cling Peach Marketing Order to prevent an aggravation of their oversupply problem in the 1957 season were discussed elsewhere in this article. Some influence on demand has also been exerted by the industry through advertising and promotion devices regulated under the marketing orders.

The results have allowed some price slippage in a fairly price-elastic sector of agriculture, but have avoided the drastic situations which have been encountered in some other sectors when an "oversupply" comes to the market and the bottom drops out of the price, with a resulting benefit to the consumer at the expense of a ruinously lower total income for the farmer. The industry has managed, through use of these inventory and supply regulation devices, to avert the greater price reductions and inroads on profits that would otherwise have occurred during the present period.

# The Aluminum Industry

## Part II: Growth of the Market

THIS is the second of three articles on the primary aluminum industry in the United States. The first provided a brief history of the industry and a description of its structure.<sup>1</sup> This study will deal with the market for aluminum and various factors that influence the demand for the metal. Aluminum at present is in a much easier supply condition than existed throughout most of the 1950's. The approach here, however, will be oriented more to long-run developments which should provide a better context for the evaluation of current market developments. It will be seen that an imbalance of supply and demand is a problem that the aluminum industry has successfully adjusted to in the past.

Two striking developments in aluminum after World War II were the rapid transition to peacetime uses and the exceptionally large increase in consumption. Immediately after World War II there was considerable concern about peacetime uses being able to absorb the production from the greatly expanded wartime capacity. Production did drop sharply after the war with the closing of Government-owned plants. In 1946, for example, production was only 409,600 tons as compared with 920,200 in 1943. By 1952, however, both production and consumption exceeded the peak levels of 1943. With the exception of a short period in 1954 and currently, aluminum has been in continually short supply with fab-

ricators clamoring for more metal to keep their plants operating.

High consumption levels have recently been the result primarily of the continued growth in regular peacetime markets, rather than of any great increase in military or defense consumption of aluminum. Although it took the Korean War mobilization requirements to trigger the doubling of primary capacity since 1950, defense uses now account for comparatively little of the nation's current aluminum consumption. In 1952, about 30 percent of the nation's aluminum supply went into direct defense uses; in 1955, it is estimated that direct military applications used less than 10 percent.

This remarkable increase in aluminum consumption for a wide variety of uses has not been restricted to the United States. Europe has exhibited an exceptionally strong demand for aluminum, relying to a large extent on Canadian production. In fact, European consumption, while not as large absolutely, has been increasing more rapidly than that of the United States in recent years. Europe currently uses slightly more than half as much aluminum as the United States. Production has not kept pace with consumption in Europe, as it has in the United States, with the result that Europe has become a much heavier net importer than formerly. Germany, Austria, and Belgium have experienced a sixfold increase in consumption since 1949, while Italy has more

<sup>1</sup> See this *Review*, August 1957. The third and final article in the series will appear in a later issue.

TABLE I  
ALUMINUM CONSUMPTION, SELECTED AREAS  
(in tons)

| Country                 | 1948      | 1950      | 1952      | 1954      | 1956      |
|-------------------------|-----------|-----------|-----------|-----------|-----------|
| United States .....     | 684,600   | 896,400   | 1,072,300 | 1,696,900 | 1,778,000 |
| Canada .....            | 65,400    | 65,200    | 90,300    | 78,200    | 91,900    |
| South America .....     | 19,800    | 23,100    | 27,600    | 25,000    | 30,000    |
| Total America .....     | 769,800   | 984,700   | 1,190,200 | 1,800,000 | 1,899,900 |
| Total Europe .....      | 397,500   | 411,200   | 631,900   | 735,000   | 961,200   |
| Total Asia .....        | 12,300    | 27,100    | 42,000    | 58,600    | 83,200    |
| Australia .....         | 5,500     | 6,900     | 9,000     | 14,000    | 21,900    |
| Russia .....            | 110,000*  | 230,800*  | 253,500*  | 305,000*  | 485,000*  |
| Total as reported ..... | 1,295,300 | 1,660,700 | 2,126,600 | 2,912,700 | 3,451,200 |

\*Estimated by American Bureau of Metal Statistics.

Source: American Bureau of Metal Statistics, *Yearbook of the American Bureau of Metal Statistics, 1956*.

than doubled its use. The United Kingdom remains the largest European consumer, using in excess of 300,000 tons per year. The need to conserve dollars has probably held down aluminum purchases by European importers. Some European firms have recently instituted plans to produce aluminum in Africa for the purpose of relieving dependence on dollar imports. Since the ratio of aluminum use relative to other metals is still low in Europe as compared with the United States, a huge potential increase exists in that market.

Growth in aluminum consumption in the United States, however, has not had an equal anywhere in the world. The increase in United States consumption from 1949 to 1955 almost equals current total consumption in Europe. From 1948 to 1956, aluminum consumption in the United States rose from 684,600 tons per annum to 1,778,000 tons, a gain of 160 percent as compared with gains of 11 percent, 0 percent, and 21 percent for copper, lead, and zinc, respectively. Part of this huge consumption increase has been satisfied by importing aluminum. Although the United States is the world's largest producer of aluminum ingot, considerable reliance is placed on imports for supplies, particularly from Canada. The proportion of United States consumption derived from imports has declined somewhat within the last decade because of increased United States production and increased foreign consumption. (Table 2)

TABLE 2  
UNITED STATES NET IMPORTS OF ALUMINUM

| Year       | Net imports<br>(000 tons) | Net imports<br>as percent<br>of total<br>consumption |
|------------|---------------------------|--|
| 1949 ..... | 90,521                    | 14.3   |
| 1950 ..... | 234,144                   | 26.1   |
| 1951 ..... | 144,707                   | 14.8   |
| 1952 ..... | 140,505                   | 13.1   |
| 1953 ..... | 345,058                   | 22.4   |
| 1954 ..... | 194,308                   | 11.4   |
| 1955 ..... | 206,885                   | 11.8   |
| 1956 ..... | 198,806                   | 10.7   |

Source: American Bureau of Metal Statistics, *Yearbook of the American Bureau of Metal Statistics, 1956*, p. 104.

**Desirable Characteristics of Aluminum**

The increase in the use of aluminum has been the result of its combination of technical properties and its relative cost. One of its outstanding

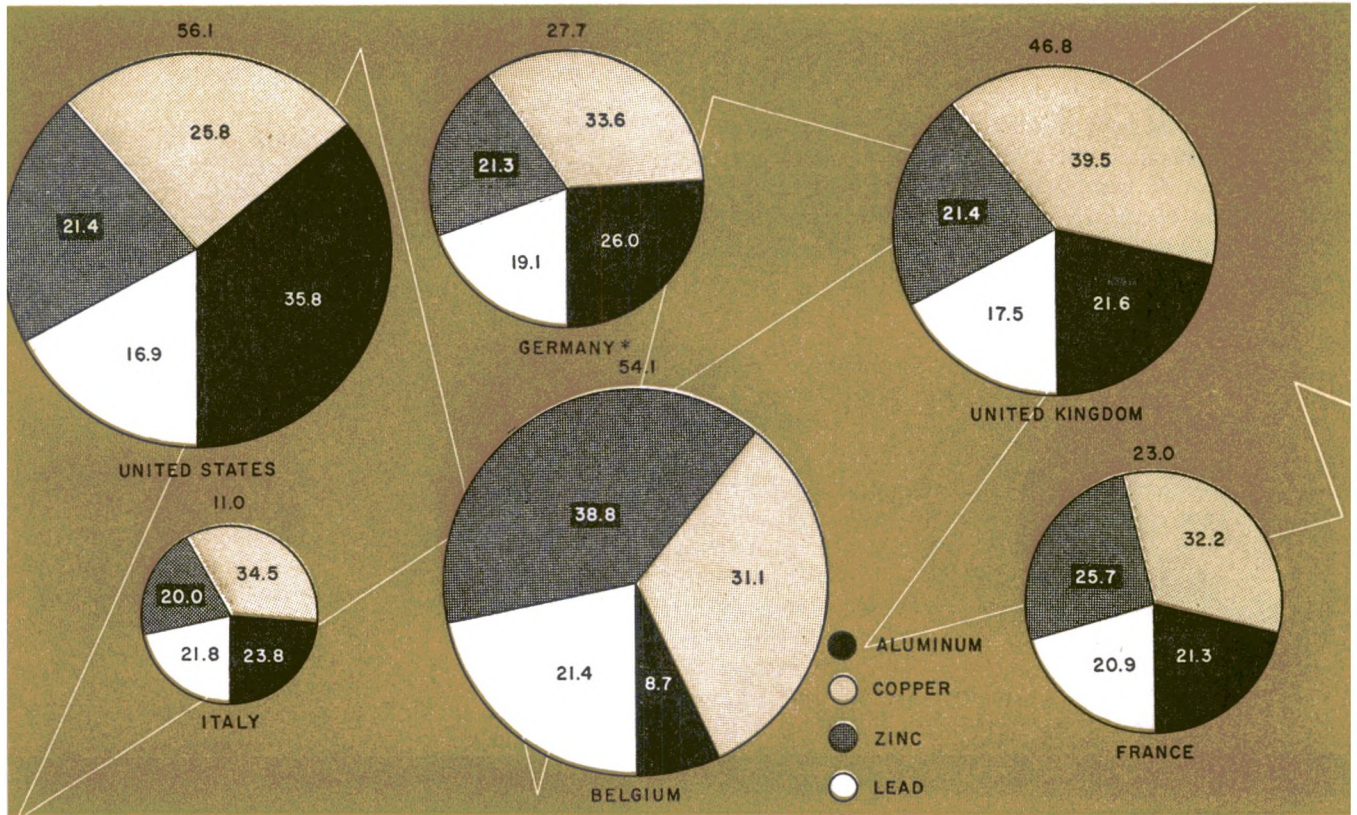
technical features is its low density relative to copper, lead, steel, zinc, and nickel. It is approximately one-third the weight of those metals, and only magnesium, of the commercially important metals, is lighter than aluminum. In addition, pure aluminum is highly resistant to corrosion, is malleable, and lends itself readily to extrusion processes. Aluminum also possesses good thermal and electrical conductivity.

In pure form aluminum is a relatively low strength metal which would be limited in use. By alloying it with other metals such as copper, magnesium, manganese, iron, zinc, and chromium, however, a great range of different properties can be obtained. Some aluminum alloys are produced that approximate the tensile strength of mild steel, for example. Mild steel is about one and one-half times stronger than alloyed aluminum but three times heavier, volume for volume. On a strength-weight basis this aluminum would be twice as strong as steel. Fatigue strength, shearing strength, elasticity, and other properties would determine usage in various applications. Aluminum alloys possess different combinations of properties and do not always retain all of the good characteristics of the pure metal. Although pure aluminum is highly corrosion resistant, in alloyed form it has suffered from salt water corrosion. Great progress has been made in this area recently, however.

Another important feature of aluminum is the excellent machinability of many of its alloys. In many instances, a fully machined aluminum alloy casting costs less than the same finished product made of iron. The iron casting may cost one-tenth as much in the rough form; but the ease of machining and handling aluminum often saves sufficient time, labor, energy, and materials to bring the final cost below that of iron.

In discussing the technical properties of aluminum it should be recognized that the metal is almost always used in the form of alloys. These alloys possess different combinations of characteristics which make them more suitable for particular applications. The use of aluminum in any particular application depends upon the requirements and its relative ability to satisfy these with respect to cost and technical qualities compared

CHART 1  
PER CAPITA CONSUMPTION OF SELECTED METALS  
1953-55 AVERAGE



\*The aluminum figures are for West Germany only; the other figures are for all of Germany.  
 Note: The figures above the circles refer to total per capita consumption of the four metals; the figures within the circles are percentages of that total.  
 Source: American Metal Market, *Metal Statistics, 1957*, for metal consumption statistics; United Nations, *Yearbook of the United Nations, 1957*, for population statistics.

to other metals. Nevertheless, the versatile qualities of aluminum and its decreasing relative cost make it a metal of growing attractiveness to a widening range of users.

**Changing Applications**

Aluminum now holds the No. 1 output position in the nonferrous field and is second only to iron and steel in the entire metals world. There are now over 4,000 end-uses of aluminum, ranging from wrapping foil to heavy industrial forgings. One of the most salient factors about aluminum is its wide range of uses, a range which seems to expand almost daily.

The Aluminum Association regularly compiles figures on the shipment of wrought products by various classes such as building materials, consumer durable goods, and transportation equipment. Building materials led the entire field of civilian uses during 1956 as they have in every year since 1946. Statistics compiled by the Aluminum Association show that building materials lead, with 19.0 percent of all wrought aluminum mill products shipped during the first half of 1956, followed by transportation applications (17.4 percent), consumer durable goods (13.0 percent), electrical uses (7.8 percent), commercial and industrial machinery and equipment

(6.2 percent), and packaging and containers (4.4 percent)<sup>1</sup>. Since wrought aluminum products account for about 80 percent of aluminum shipments, the distribution of wrought aluminum for end-uses of consumption is an accurate description of the consumption pattern within broad lines.

Although detailed changes in the consumption pattern of aluminum are not available on a historical basis, some qualitative appreciation of the changes in aluminum consumption patterns is revealing. In practically every field aluminum is securing a firmer foothold.

#### **Building materials**

Since 1950, aluminum consumed in building and construction applications has doubled. Roofing and siding, door frames, window frames, molding and trim, awnings, curtain walls, builders' hardware, insect screening, and foil insulation constitute some of the uses in the building field. Door and window frames, however, now constitute the largest single end-use of aluminum in the building industry. Until the mid-1930's aluminum windows were premium-priced sidelines and were made only by a few companies whose principal product was ornamental metalwork. Today aluminum is estimated to account for 30 percent of all new window frame installations in the United States. Aluminum's corrosion resistance is its main advantage in this application.

Builders' hardware is another fast growing application of aluminum in this field. The metal was not used in builders' hardware to a significant extent prior to 1952. In 1953 and 1954 it is estimated that at least 10 percent of all builders' hardware was made of aluminum. Aluminum hardware, however, has met some resistance at the residential level because of the quality connotation associated with the appearance of brass. The employment of aluminum as the outer wall covering for commercial buildings also seems to find increasing favor, although this development is quite recent. Use of aluminum curtains and panels allows a reduction in footings and outside scaffolding and generally speeds construction.

<sup>1</sup> These figures are obtained from the Aluminum Association Release of October 24, 1956.

#### **Transportation**

Although the transportation field has dropped to the second most important outlet for aluminum, it still has been growing rapidly. Aluminum finds important uses in aircraft, railroads, and motor vehicles in addition to growing usage in marine transportation.

The application of aluminum in aircraft is one of its most important military uses. Planes made today average 75-85 percent aluminum. As military aircraft speeds increase, however, aluminum may lose out in this field to titanium and stainless steel. Air friction at supersonic speeds generates so much heat that aluminum loses its structural properties, but the aluminum industry is trying to develop alloys capable of withstanding high operating temperatures and has reported some success in recent months.

The most promising market for aluminum in the transportation industry probably lies in the automotive field. The use of aluminum per automobile averaged about 35 pounds in 1956, as compared with slightly more than 12 pounds in 1954. One large auto company used 65 pounds in its 1954 models. Each El Dorado Cadillac used 197 pounds of aluminum in 1956. Pistons, axle housings, automatic transmissions, body trim, window frames, and ignition system components are often made of aluminum. Aluminum pistons are now used in all American automobiles because of their low weight and good thermal conductivity. The largest single use of aluminum in motorcars is in the torque-converter-type automatic transmission. Indicative of the trend to aluminum in the automotive field has been the construction of two automobile foundries adjacent to aluminum smelters that will deliver the molten metal directly.

The bus and trucking field presents a slightly different picture. Aluminum already represents 15-25 percent of the total weight of modern buses. Aluminum's lightness is desirable in large buses to allow them to meet legal weight limits and to increase the effective capacity of tires, brakes, axles, and springs. Aluminum is used for the same purpose in tractor trailers. It has been estimated that the higher initial cost is offset by increased payloads within one year.



Railroad equipment manufacturers have also greatly increased their consumption of aluminum since World War II. The amount used per car varies from "all-aluminum" cars to the more conventional types where aluminum is used for trim design, accessories, and other minor components. In freight car construction aluminum is still largely experimental except for specially designed tank cars and special purpose cars. The railroad field seems to offer a large potential demand, especially in rolling stock.

Marine transportation has been the least important outlet for aluminum in the transportation field because of the problems that aluminum encountered with marine corrosion. Progress in the application of aluminum has been notable in this field only within the last 20 years. Today, however, aluminum is being applied in shipbuilding and marine components where wood and steel were previously the only materials used. In general, one ton of aluminum can be utilized to do the job which otherwise would require two tons of steel. In naval vessels, this means greater fuel capacity, and hence longer operating ranges; in mercantile vessels, a larger cargo at equal or lower power output.

#### **Consumer durable goods**

This field was one of the first major outlets for aluminum. Although aluminum cooking utensils are still quite popular, this field now covers such applications as household appliances, furniture, lighting fixtures, toys, lawn mowers, and venetian blinds. Over the years aluminum has enjoyed growing markets in the consumer durable fields not only by wider application but by the growth in the field of consumer durables themselves.

#### **Electrical markets**

Aluminum has long been making inroads on copper as the leading material for conducting electricity. Virtually all power systems make some use of aluminum in the transmission and distribution of electric power. Bare aluminum conductor has accounted for the preponderant portion of aluminum used in this field. The principal types are all-aluminum cable and ACSR (aluminum conductor steel reinforced), the lat-

ter consisting of aluminum wires stranded around a steel core. ACSR combines the high conductivity and light weight of aluminum with the strength of steel. It is estimated that more than 90 percent of all new transmission lines in the United States and most rural distribution lines use aluminum. Weight for weight, aluminum possesses twice the electrical conductivity of copper. Aluminum is not so widely used in urban distribution lines because it is bulkier than copper and requires more insulation material when used in highly urbanized areas. In addition, aluminum finds diverse uses in various types of electrical, electronic, and communications equipment.

#### **Machinery and equipment, except electrical**

This broad market includes general purpose industrial machinery, such as process tanks, pressure vessels, engine components, compressors; special purpose machinery, such as textile industry machinery and petroleum refining machinery; metal working machinery, including machine tools, jigs, and fixtures; agricultural machinery, including irrigation pipe; and a wide variety of other uses. These are all applications that at one time were handled by other metals.

#### **Containers and packaging**

Aluminum's versatility is shown in its importance in the field of packaging and containers. Foil production has been increasing rapidly, indicating the strong demand for aluminum for packaging. Shipments of foil increased from not quite 43,000 tons in 1952 to 76,000 tons in 1955. Aluminum foil packaging provides excellent appearance plus economical protection for many products. A promising outlet in the container field is that of cans for foodstuffs. Experiments indicate that satisfactory cans of aluminum alloy or aluminum-clad steel can be produced by conventional can-making machinery with minor modifications. Thus far such cans have not been competitive pricewise. Even the capture of a small part of the can market would open up a large new outlet for aluminum in a field that is growing rapidly.

It is obvious that aluminum has a wide and expanding range of application. Not only are its older outlets expanding, but it is enjoying growth

in new fields. Nevertheless, aluminum not only has formidable competition from well established metals, but will be faced with competition from newly emerging metals.

#### **Competition From New Metals**

Aluminum is now facing, in a sense, the same problems that the older, established metals faced when aluminum first made its appearance. Aluminum forced its way into the province of wood, steel, copper, tin, and glass in a wide variety of fields. Only in the aircraft industry did it satisfy a need that could not easily be satisfied by another product. Although aluminum is still finding new uses at a rapid pace, it will face competition in certain specialized uses from well-known metals like magnesium and stainless steel as well as from the so-called new wonder metals like titanium, zirconium, and columbium.

#### **Stainless steel**

Stainless steel, like aluminum in its infancy, was associated with eating and cooking utensils. Like aluminum, it has now been adapted to a wide variety of industrial uses. In fact, stainless is invading the aircraft field, long an aluminum monopoly. At speeds above 1,150 miles per hour aluminum alloys lose their strength from the terrific heat generated by air friction. Stainless steel performs even better at high temperatures than titanium, the highly touted wonder metal. In addition, stainless steel is competing with aluminum in the building and transportation fields. Both products have certain technical qualities that will always prevent either from displacing the other, but in many uses price will be the determining factor.

#### **Magnesium**

Magnesium has long been heralded as the major competitor of aluminum, but after 36 years it is still a minor factor in the metals market. Only one company was engaged in the production of magnesium at the end of 1956. The peak primary production was reached in 1943 when 183,584 tons were produced. The production reached a low of 5,317 tons in 1946 and then rose to a new high of 105,821 tons in 1952. Production dropped to only 61,135 tons in 1955 but increased to 68,-

345 tons in 1956. The United States produces close to half of the world output.

Even though magnesium can be obtained at moderate cost in unlimited amounts, its large scale use awaits technical improvement in alloying and fabricating the metal. One feature of magnesium is that it can be produced from domestic resources. Magnesium is the lightest of all structural metals in common use. It is two-thirds the weight of aluminum and less than one-fourth that of steel. Its largest use is as an alloy in aircraft construction for secondary airplane structures, structural parts, engines, and wheels, where stresses are sufficiently mild to permit its use rather than that of stronger but heavier aluminum alloys.

It competes with aluminum in flooring, frames, and bodies of trucks and trailers and is used also in ladders, tools, and other light equipment. Its most promising structural uses are in fields where lightness and rigidity offer economies over heavier metals, although its relative weakness is a problem. In addition, magnesium has suffered from corrosion problems and inflammability. Difficulties have been encountered in machining because of its tendency to ignite. In structural shapes of thick cross-section, the corrosion factor is minimized; and magnesium should prove of great value where light weight is vital.

It is apparent that much more work is needed on magnesium before it becomes a serious competitor to aluminum. Development of an alloy with better corrosion resistance or the discovery of a satisfactory coating for magnesium could lead to a rapid increase in magnesium consumption. Contact with iron, copper, and aluminum causes serious corrosion of magnesium, most severe in the case of iron and progressively less with the other two metals. Magnesium could conceivably be a strong competitor of aluminum, but this development will be dependent on technological changes.

Although aluminum took many years to become commercially important after its discovery, and magnesium has not reached major importance, two new metals may be able to circumvent the long adaptive process that aluminum endured. The urgency of defense needs, the rapid develop-

ments in atomic energy, and aircraft development have opened needs that cannot be satisfied with the older metals. As a result, metals like titanium and zirconium are being produced to satisfy certain technical needs almost regardless of cost. Titanium, like aluminum and magnesium, is a common ingredient of the earth's crust but occurs nowhere in the native state. Titanium compounds have been used for some time, especially by the paint industry; but metallic titanium was not produced commercially until very recently, when the Bureau of Mines announced that it had succeeded in developing a commercial process.

### **Titanium**

It was not until 1938 that the Bureau of Mines began investigating the technology of titanium and conducted a survey and small-scale trial of virtually all suggested methods for producing titanium. Interest was aroused after the Bureau of Mines' demonstration that ductile titanium could be produced on a pilot-plant scale and following distribution of free titanium samples for property and use studies. The world's first small-scale commercial production of ductile titanium metal was begun at Newport, Delaware, by the E. I. duPont de Nemours Company, July 1948. Limited commercial availability was announced by duPont in September 1948. The National Lead Company soon followed in the field by constructing two pilot plants in Sayreville, New Jersey and Niagara Falls, New York. In 1950, National Lead Company and Allegheny Ludlum Steel Corporation organized the Titanium Metals Corporation of America to produce and market titanium metal, alloys, and related products. The site of the new operation was the former Basic Magnesium plant at Henderson, Nevada, built by the government during World War II. Another titanium plant is operated in Nevada at Boulder City by the Federal Bureau of Mines. Five companies are now producing titanium and two more have indicated plans to enter the field. Production was up to 14,000 tons in 1956, a large increase over the few pounds produced in 1948. Most of this production was purchased by the government for use in the aircraft industry, which has special uses for a metal with titanium's combination of characteristics.

Titanium is light, strong, and highly corrosion resistant, particularly in marine atmospheres. It is about 42 percent lighter than stainless steel, but it is nearly as strong and has comparable resistance to corrosion in general and superior resistance to marine corrosion. It can be machined and drawn into wire or sheets and has a greater ability to withstand mechanical shock and abrasion than many of the best alloy steels. As compared to aluminum, titanium is significantly stronger for its weight, is much harder, and even less susceptible to corrosion. Titanium alloys lose their strength characteristics rapidly at temperatures above 800° Fahrenheit but are better than competitive materials at working temperatures between 400° and 800° Fahrenheit.

The great drawback as yet is its expensive reduction process and the difficulties in fabricating the metal. Titanium is currently selling at about \$2 per pound. Production has expanded rapidly since 1948, however, when it was first produced outside the laboratory. By the end of 1956, total United States capacity had reached 25,000 tons per year. Mill products of titanium are currently ten times more costly than those of stainless steel, its closest competitor. The Air Force consumes over 90 percent of the titanium that is produced today and indicates a need for more.

Although titanium definitely has a secure future usage, its rate of acceptance and production will depend on lowering the cost of extracting titanium from its ores and a large reduction in its fabricating costs. Fabricators, who are still experimenting with alloy types, must turn out the kind of mill products which the aircraft makers and other industries want for future designs. Although technically titanium could be a strong competitor for aluminum, it will be some years before its potential is realized because of its high relative cost.

### **Conclusion**

One of the striking features of aluminum has been its price movements during the past 15 years. In contrast to most other metal prices, aluminum decreased in price during the war years, dropping from 20 cents per pound in 1939 to 15 cents by 1943. Aluminum prices remained

at 15 cents per pound until 1948 and did not reach their 1939 level again until 1953. Throughout 1956 aluminum was selling at approximately 25 percent more than its 1939 price while the comparable percentage rises for copper, lead, zinc, tin, and steel billets were 300, 200, 130, 90, and 125 respectively. Aluminum is now cheaper relative to copper, lead, and zinc than throughout most of its history. Recent declines in copper, lead, and zinc have reversed the trend somewhat, but aluminum is still in an advantageous price position relative to the prewar period. Additional production can probably be obtained without its becoming more expensive relative to other metals.

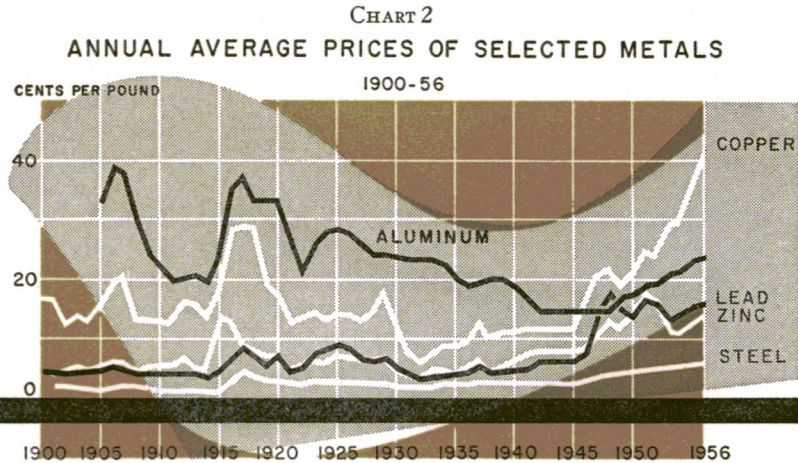
On balance, the prospects for increased aluminum consumption are quite good. It is continually finding new and expanding uses in the construction, transportation, electrical machinery and equipment, packaging, and durable goods fields. Europe is undergoing the same revolution in the use of aluminum as the United States but has had a later start. As long as manufacturing and construction activity hold up, aluminum will find increasing markets, especially with its low current price relative to competing metals.

The President's Materials Policy Commission Report published in 1952 foresees a demand of 4.5 million tons of aluminum by 1975, or almost three times the level of United States consumption in 1956. The commission expects that aluminum's relative price will become even more attractive although aluminum producers in the United States are facing higher power costs in their more recent additions to capacity. The Policy Report concludes that United States primary

capacity will expand severalfold to meet this demand.

In a report titled *International Trade, 1956*, the contracting parties to the General Agreement on Tariffs and Trade (GATT) exhibit a similar optimism about the future demand for aluminum in Europe by 1973-75. Output of aluminum in Western Europe is expected to climb by 60 percent or some 300,000 tons from 1953-55 levels. Imports of aluminum are expected to rise to 1.1 million tons for an increase of 800 percent. The GATT report forecasts that supply will increase more than demand in North America and that North American exports may increase almost fourfold. On the basis of these long-run forecasts, present aluminum capacity will be quite inadequate to satisfy demand within the next 25 years.

The article to follow will discuss the factors influencing the location of reduction plants and the forces that may alter the present cost structure influencing the concentration of aluminum reduction centers. Special attention will be devoted to the Pacific Northwest as a location for aluminum reduction and the future role it is likely to play in the United States aluminum industry.



Source: American Metal Market, *Metal Statistics, 1957*.  
Note: Copper figures from 1941 through 1947 exclude government bonus payments to marginal producers; zinc prices from 1942 through 1947 exclude government bonus payments to marginal producers.

BUSINESS INDEXES — TWELFTH DISTRICT<sup>1</sup>

(1947-49 average = 100)

| Year and month | Industrial production (physical volume) <sup>2</sup> |                        |         |        |                   |                     |                | Total nonagricultural employment | Total mfg employment | Car-loadings (number) <sup>2</sup> | Dep't store sales (value) <sup>2</sup> | Retail food prices <sup>3, 4</sup> | Waterborne foreign trade <sup>5, 6</sup> |         |
|----------------|--|------------------------|---------|--------|-------------------|---------------------|----------------|----------------------------------|----------------------|------------------------------------|--|------------------------------------|--|---------|
|                | Lumber   | Petroleum <sup>3</sup> |         | Cement | Lead <sup>3</sup> | Copper <sup>3</sup> | Electric power |                                  |                      |                                    |  |                                    | Exports                                  | Imports |
|                |  | Crude                  | Refined |        |                   |                     |                |                                  |                      |                                    |  |                                    |  |         |
| 1929           | 95   | 87                     | 78      | 54     | 165               | 105                 | 29             | ....                             | ....                 | 102                                | 30                                     | 64                                 | 190                                      | 124     |
| 1933           | 40   | 52                     | 50      | 27     | 72                | 17                  | 26             | ....                             | ....                 | 52                                 | 18                                     | 42                                 | 110                                      | 72      |
| 1939           | 71   | 67                     | 63      | 56     | 93                | 80                  | 40             | ....                             | 55                   | 77                                 | 31                                     | 47                                 | 163                                      | 95      |
| 1948           | 104  | 101                    | 100     | 104    | 105               | 101                 | 101            | 102                              | 102                  | 100                                | 104                                    | 103                                | 86                                       | 98      |
| 1949           | 100  | 99                     | 103     | 100    | 101               | 93                  | 108            | 99                               | 97                   | 94                                 | 98                                     | 100                                | 85                                       | 121     |
| 1950           | 113  | 98                     | 103     | 112    | 109               | 113                 | 119            | 103                              | 105                  | 97                                 | 105                                    | 100                                | 91                                       | 137     |
| 1951           | 113  | 106                    | 112     | 128    | 89                | 115                 | 136            | 112                              | 120                  | 100                                | 109                                    | 113                                | 186                                      | 157     |
| 1952           | 116  | 107                    | 116     | 124    | 87                | 112                 | 144            | 118                              | 130                  | 101                                | 114                                    | 115                                | 171                                      | 200     |
| 1953           | 118  | 109                    | 122     | 130    | 77                | 111                 | 161            | 121                              | 137                  | 100                                | 115                                    | 113                                | 140                                      | 308     |
| 1954           | 111  | 106                    | 119     | 133    | 71                | 101                 | 172            | 120                              | 134                  | 96                                 | 114                                    | 113                                | 131                                      | 260     |
| 1955           | 121  | 106                    | 122     | 145    | 75                | 117                 | 192            | 127                              | 143                  | 104                                | 122                                    | 112                                | 164                                      | 308     |
| 1956           | 116  | 105                    | 129     | 156    | 77                | 118                 | 210            | 134                              | 152                  | 104                                | 129                                    | 114                                | 195                                      | 443     |
| 1956           |  |                        |         |        |                   |                     |                |                                  |                      |                                    |  |                                    |  |         |
| August         | 117  | 105                    | 128     | 171    | 84                | 123                 | 212            | 135                              | 153                  | 101                                | 131                                    | 114                                | 207                                      | 500     |
| September      | 112  | 104                    | 136     | 168    | 78                | 122                 | 209            | 135                              | 153                  | 107                                | 131                                    | 114                                | 212                                      | 459     |
| October        | 110  | 104                    | 128     | 163    | 81                | 127                 | 217            | 136                              | 154                  | 102                                | 130                                    | 115                                | 256                                      | 563     |
| November       | 111  | 104                    | 135     | 146    | 79                | 123                 | 216            | 137                              | 156                  | 100                                | 132                                    | 116                                | 242                                      | 401     |
| December       | 112  | 103                    | 132     | 139    | 72                | 123                 | 210            | 138                              | 159                  | 106                                | 131                                    | 116                                | 234                                      | 436     |
| 1957           |  |                        |         |        |                   |                     |                |                                  |                      |                                    |  |                                    |  |         |
| January        | 108  | 102                    | 131     | 120    | 79                | 125                 | 220            | 139                              | 160                  | 105                                | 131                                    | 116                                | 237                                      | 421     |
| February       | 115  | 102                    | 130     | 127    | 88                | 138                 | 211            | 138                              | 159                  | 96                                 | 127                                    | 117                                | 269                                      | 417     |
| March          | 115  | 101                    | 132     | 140    | 88                | 133                 | 221            | 138                              | 159                  | 100                                | 133                                    | 116                                | 267                                      | 489     |
| April          | 111  | 101                    | 132     | 154    | 78                | 135                 | 228            | 138                              | 159                  | 103                                | 127                                    | 117                                | 298                                      | 534     |
| May            | 111  | 101                    | 138     | 157    | 82                | 126                 | 229            | 138                              | 159                  | 99                                 | 126                                    | 117                                | 283                                      | 698     |
| June           | 114  | 101                    | 131     | 152    | 75                | 130                 | 239            | 139                              | 160                  | 101                                | 131                                    | 118                                | 253                                      | 511     |
| July           | 109  | 101                    | 133     | ...    | 68r               | 133                 | 238            | 138                              | 159                  | 94                                 | 133r                                   | 118                                | ...                                      | ...     |
| August         | ...  | 101                    | 137     | ...    | 71                | 142                 | ...            | 137                              | 157                  | 105                                | 130                                    | 118                                | ...                                      | ...     |

BANKING AND CREDIT STATISTICS — TWELFTH DISTRICT

(amounts in millions of dollars)

| Year and month | Condition items of all member banks <sup>6</sup> |                       |                                       |                     | Bank rates on short-term business loans <sup>8</sup> | Member bank reserves and related items |                               |                        |                                   | Reserves <sup>11</sup> | Bank debits Index cities <sup>12</sup> (1947-49 = 100) <sup>3</sup> |
|----------------|--|-----------------------|---------------------------------------|---------------------|--|--|-------------------------------|------------------------|-----------------------------------|------------------------|---|
|                | Loans and discounts                              | U.S. Gov't securities | Demand deposits adjusted <sup>7</sup> | Total time deposits |  | Factors affecting reserves:            |                               |                        |                                   |                        |   |
|                |  |                       |                                       |                     |  | Reserve bank credit <sup>9</sup>       | Commer-<br>cial <sup>10</sup> | Treasury <sup>10</sup> | Money in circulation <sup>9</sup> |                        |   |
| 1929           | 2,239  | 495                   | 1,234                                 | 1,790               | ....   | - 34                                   | 0                             | + 23                   | - 6                               | 175                    | 42  |
| 1933           | 1,486  | 720                   | 951                                   | 1,609               | ....   | - 2                                    | - 110                         | + 150                  | + 18                              | 185                    | 18  |
| 1939           | 1,967  | 1,450                 | 1,983                                 | 2,267               | ....   | + 2                                    | - 192                         | + 245                  | + 31                              | 584                    | 30  |
| 1949           | 5,325  | 7,016                 | 8,536                                 | 6,255               | 3.20   | + 13                                   | - 930                         | + 378                  | - 65                              | 1,924                  | 102   |
| 1950           | 7,093  | 6,415                 | 9,254                                 | 6,302               | 3.35   | + 39                                   | - 1,141                       | + 1,198                | - 14                              | 2,026                  | 115   |
| 1951           | 7,866  | 6,463                 | 9,927                                 | 6,777               | 3.66   | + 21                                   | - 1,582                       | + 1,983                | + 189                             | 2,269                  | 132   |
| 1952           | 8,839  | 6,619                 | 10,520                                | 7,502               | 3.95   | + 7                                    | - 1,912                       | + 2,265                | + 132                             | 2,514                  | 140   |
| 1953           | 9,220  | 6,639                 | 10,515                                | 7,997               | 4.14   | - 14                                   | - 3,073                       | + 3,158                | + 39                              | 2,551                  | 150   |
| 1954           | 9,418  | 7,942                 | 11,196                                | 8,699               | 4.09   | + 2                                    | - 2,448                       | + 2,328                | - 30                              | 2,505                  | 154   |
| 1955           | 11,124   | 7,239                 | 11,864                                | 9,120               | 4.10   | + 38                                   | - 2,685                       | + 2,757                | + 100                             | 2,530                  | 172   |
| 1956           | 12,613   | 6,452                 | 12,169                                | 9,424               | 4.50   | - 52                                   | - 3,259                       | + 3,274                | - 96                              | 2,654                  | 189   |
| 1956           |  |                       |                                       |                     |  |  |                               |                        |                                   |                        |   |
| September      | 12,423   | 6,491                 | 11,581                                | 9,305               | 4.57   | + 3                                    | - 454                         | + 466                  | - 59                              | 2,640                  | 182   |
| October        | 12,384   | 6,468                 | 11,747                                | 9,326               | ....   | - 5                                    | - 417                         | + 312                  | - 2                               | 2,542                  | 195   |
| November       | 12,504   | 6,431                 | 11,867                                | 9,235               | ....   | 0                                      | - 143                         | + 209                  | + 38                              | 2,579                  | 195   |
| December       | 12,804   | 6,383                 | 12,078                                | 9,356               | 4.65   | - 17                                   | - 303                         | + 451                  | + 38                              | 2,654                  | 200   |
| 1957           |  |                       |                                       |                     |  |  |                               |                        |                                   |                        |   |
| January        | 12,488   | 6,505                 | 11,812                                | 9,587               | ....   | + 33                                   | - 558                         | + 249                  | - 144                             | 2,548                  | 206   |
| February       | 12,556   | 6,356                 | 11,279                                | 9,690               | ....   | + 41                                   | - 816                         | + 494                  | - 139                             | 2,517                  | 200   |
| March          | 12,576   | 6,177                 | 11,129                                | 9,794               | 4.74   | - 37                                   | - 170                         | + 170                  | - 9                               | 2,495                  | 199   |
| April          | 12,649   | 6,520                 | 11,622                                | 9,839               | ....   | - 35                                   | - 445                         | + 430                  | - 31                              | 2,560                  | 202   |
| May            | 12,694   | 6,315                 | 11,210                                | 9,995               | ....   | + 56                                   | - 261                         | + 209                  | + 54                              | 2,526                  | 200   |
| June           | 12,911   | 6,249                 | 11,310                                | 10,155              | 4.81   | - 29                                   | - 374                         | + 402                  | + 20                              | 2,483                  | 203   |
| July           | 12,912   | 6,319                 | 11,407                                | 10,188              | ....   | - 49                                   | - 426                         | + 320                  | + 6                               | 2,457                  | 205   |
| August         | 12,945   | 6,313                 | 11,329                                | 10,220              | ....   | + 50                                   | - 145                         | + 292                  | + 39                              | 2,592                  | 197   |
| September      | 13,178   | 6,293                 | 11,561                                | 10,301              | 5.21   | - 109                                  | - 434                         | + 480                  | - 30                              | 2,581                  | 204   |

<sup>1</sup> Adjusted for seasonal variation, except where indicated. Except for department store statistics, all indexes are based upon data from outside sources, as follows: lumber, California Redwood Association and U.S. Bureau of the Census; petroleum, cement, copper, and lead, U.S. Bureau of Mines; electric power, Federal Power Commission; nonagricultural and manufacturing employment, U.S. Bureau of Labor Statistics and cooperating state agencies; retail food prices, U.S. Bureau of Labor Statistics; carloadings, various railroads and railroad associations; and foreign trade, U.S. Bureau of the Census.  
<sup>2</sup> Daily average. <sup>3</sup> Not adjusted for seasonal variation. <sup>4</sup> Los Angeles, San Francisco, and Seattle indexes combined. <sup>5</sup> Commercial cargo only, in physical volume, for Los Angeles, San Francisco, San Diego, Oregon, and Washington customs districts; starting with July 1950, "special category" exports are excluded because of security reasons. <sup>6</sup> Annual figures are as of end of year, monthly figures as of last Wednesday in month. <sup>7</sup> Demand deposits, excluding interbank and U.S. Gov't deposits, less cash items in process of collection. Monthly data partly estimated. <sup>8</sup> Average rates on loans made in five major cities. <sup>9</sup> Changes from end of previous month or year. <sup>10</sup> Minus sign indicates flow of funds out of the District in the case of commercial operations, and excess of receipts over disbursements in the case of Treasury operations. <sup>11</sup> End of year and end of month figures. <sup>12</sup> Debits to total deposits except interbank prior to 1942. Debits to demand deposits except U.S. Government and interbank deposits from 1942.  
 p—Preliminary. r—Revised.

