TIRES AND INNER TUBES

A sharp increase in demand for tires during the first four months of 1950 brought the tire and inner tube industry out of a two-year slump. The rise reflected record breaking automotive production, accelerated purchases of tire replacements, and inventory stockbuilding. Production worker employment in April 1950 was 84,000 - 2.3 percent above December 1949. In December 1949, weekly hours for the industry averaged 37.3, in April 1950, 39.0. Since a large segment of the industry has a normal workweek of 36 hours, the current work schedules reveal a substantial amount of overtime. Early reports from the industry for May indicate a continuation of the general upturn.

Production Reflects Several Types of Demand

The current production trend is in contrast to the decline which has characterized the industry since the boom of the first two postwar years. War deferred demand was quickly met by the tire and inner tube industry. Conversion to peacetime production was unhampered by serious bottlenecks. New plant capacity and production of synthetic rubber had been developed during the war. As a result, a record production of 78.0 million passenger car tires, 17.7 million truck and bus tires, and 5.0 million tractor and implement tires was attained in 1947.

Over the next two years, tire production fell. In 1949 passenger car tire output totaled 65.2 million, truck and bus 11.2, and tractor and implement 4.7. The decline reflected primarily the drop in demand for replacements (see Table 1, page 3) - the most important segment of the tire market. Factors in the overall decline were: the saturation of the market, a rise in the retreading of worn-out tires, and the paring of manufacturers' inventories. The latter tendency is illustrated by the greater fall in production of tires between 1948 and 1949 - 6 percent - than that for shipments - 1 percent. Throughout the postwar period, the demand for original equipment (tires purchased for use on new vehicles) has increased consistently in the passenger car field.

Table 1

Tire Shipments
(in thousands)

	Passenger car		Truck and bus		Tractor and Implement	
	Original	Replacement	Original	Replacement	Original	Replacement
1946	11,155	54,790	4,225	10,810	2,190	2,400
1947	19,715	52,890	5,410	10,035	2,855	1,740
1948	21,655	41,450	5,240	7,905	3,715	1,410
1949	28,170	36,500	3,465	7,045	3,465	1,030
1950: -						
Jan.	2,800	2,195	345	515	285	65
Feb.	2,890	2,340	355	540	305	95
Mar.	2,490	3,135	345	730	350	130
Apr.	2,655	3,700	325	745	355	110

Source: Rubber Division, Department of Commerce.

Three-Year Decline in Employment

The trend of employment in the tire and inner tube industry has been downward since the first quarter of 1947. Production-worker employment fell from 106,000 in 1947 to 84,000 in 1949 - a 21 percent decline.

The trough of the decline was reached in mid-1949; since then the industry has been expanding operations. Employment rose 4 percent between August 1949 and April 1950. Over the same period weekly hours increased from 36.0 to 39.0.

Compared with a year ago, employment in April had dropped 6 percent; the workweek, however, expanded sharply from 35.4 to 39.0 hours, a 10 percent increase. The net effect of the decrease in employment and lengthened workweek was an over-the-year increase of 4 percent in the number of manhours worked.

Establishments comprising the industry vary widely as to size, type of market served and workweek patterns. The differences in the employment and workweek level between Ohio and California reflect these variations. In California, the several establishments are relatively large and, for the most part, satisfy all types of demand. In Ohio, there are, in addition to the larger companies, quite a few small plants which specialize in replacement demand. These latter units

found their markets particularly depressed in 1949. The lower level of hours in Ohio also reflects the greater prevalence of the six-hour - six-day workweek in contrast to the eight-hour - five-day week in most other States.

Table II

Employment Index 1/, Hours and Earnings for Production Workers in the Tire and Inner Tube Industry, 1949-1950

	Employment Index (April 1949 = 100)				Average hours and earnings April 1950		
	1949		1950		Weekly earnings	Weekly hours	Hourly earnings
	Apr.	Aug.	Mar.	Apr.			
Total U. S.	100.0	91.4	94.1	94.7	$69.32	38.9	$1.782
Ohio	100.0	86.8	90.9	90.5	61.76	34.6	1.785
California	100.0	96.8	100.5	101.8	72.11	40.9	1.763

1/ Data are based on a sample group of establishments comprising more than 92 percent of the industry. For U. S. totals see page 6. State totals are not available.

Tire Prices Relatively Stable

The rise in the manufacturers' price of tires and tubes since 1939 has been insignificant compared to that for all commodities. Between 1939 and 1949, the wholesale price index for the tires rose but 7 percent, for all commodities 100 percent. The relative stability in tire prices reflects to a great extent the availability of synthetic rubber at reasonable cost (18½ cents per pound) in the postwar period. In mid-1949, tire prices sagged to their lowest postwar level as a result of a decline in tire demand.

The upturn in demand which became evident in September 1949 and the stringency in the supply of new rubber (both synthetic and natural) has since changed that picture. The price of natural rubber has almost doubled between September 1949 and June 1950, and tire prices, over the same period, have risen more than 7 percent. The rise for truck tires, which require a greater proportion of natural rubber, was heaviest.

The tight market for new rubber stems from several factors. Synthetic production was reduced in view of last summer's pessimism. At present, expansion is somewhat hindered by the inadequate supply of benzol which is essential for synthetic rubber manufacturing. Concurrently, natural rubber has become scarcer as increased orders appeared which reflected immediate needs as well as uneasiness over the unsettled conditions in the Far Eastern rubber growing sections.

Industry Prospects

The tire and inner tube industry undoubtedly views the future optimistically. Currently, tire production is at about the highest level since 1947 - primarily as a result of present record motor vehicle output. The first half of 1950 will be decidedly better in terms of number of tires produced than the comparable period of 1949.

On the basis of production estimates made available by the Rubber Manufacturers Association, it seems probable that total output in 1950 will substantially exceed that for 1949. The high rate of passenger car output since 1947 is expected to result in an increasing demand for replacement tires. In 1949, replacement tire demand comprised 41 percent of unit sales; a return to the prewar level of about 60 percent is anticipated.

The future raw material situation of the industry appears comfortable barring radical changes in the Far East. Cost and qualitative improvements in synthetic rubber production may improve the competitive position of that product in respect to natural rubber and provide a more stable and cheaper supply of rubber for the industry.

Table III

Employment of Production Workers in the Tire and Inner Tube Industry, by Month 1947-1950

Month	Year			
	1947	1948	1949	1950
Average	105,800	96,200	83,600	
January	111,000	104,000	91,300	82,600
February	110,500	102,300	89,400	83,100
March	110,100	99,600	88,600	83,500
April	108,800	95,700	88,600	84,000
May	106,300	94,400	87,200	
June	104,600	95,000	86,300	
July	102,200	94,000	82,000	
August	104,500	94,700	80,900	
September	101,500	94,400	64,300	
October	103,000	93,100	81,100	
November	103,500	94,300	81,300	
December	103,100	92,700	82,100	

STEEL MILLS

Rising demand for durable goods in May brought with it record steel output and high-level employment in the steel industry. Total employment in blast furnaces, steel works and rolling mills reached 606,500, the highest point in 12 months, as output rose to an all-time high of 8.5 million tons of raw steel. This was the fourth month in steel history in which more than 8 million tons of raw steel were produced. The average workweek of the industry's 529,500 production workers was 39.7 hours in mid-May as compared with 38.7 in May 1949.

Present above-capacity production is the result of heavy demands by steel-consuming industries and the backlog of orders from the succession of recent steel and coal work stoppages.

Employment At Peak For Year

Total employment in blast furnaces, steel works, and rolling mills reached 606,500 in May, an increase of 7,200 over the preceding month. The post-war peak--629,000--was reached in February 1949, after which employment dropped sharply in August to a low of 572,000. The steel strike of October-November temporarily halted a new upward trend. By December, employment had rebounded to 580,000 and has been rising almost steadily since then.

May labor turnover rates for the industry indicate a relatively stable workforce. Workers were hired during the month at the rate of 26 for every 1000 persons on the payroll as compared with an average of 42 per 1000 for all manufacturing industries. Separations, for all reasons, occurred at the rate of only 14 per 1000, less than half the rate for manufacturing as a whole.

Varied State Patterns

More than 90 percent of steel capacity is concentrated in 10 states, and more than two-thirds in four. However, employment has registered gains in locations closer to the markets for steel products, as evidenced particularly by California and Michigan on the one hand, and Ohio and West

Virginia on the other. Employment in Ohio and West Virginia has remained about the same or lower than a year ago; in California and Michigan production-worker employment has increased by nearly 5 percent and 18 percent respectively. According to the American Iron and Steel Institute, California has moved up from tenth place in steel making capacity in 1948 to ninth place in 1950, replacing West Virginia. Likewise, Michigan, a large steel consumer, has risen from eighth to seventh place in the same period.

Although steel employment in May was about the same as a year ago, the over-the-year trend varied in the major steel states. Pennsylvania and Ohio, accounting for about 50 percent of steel furnace capacity between them, were below last May's employment levels. In addition to Michigan and California, important gains were recorded in Indiana and Illinois (See Table I below).

Table I

Employment Index 1/, 1949-1950, Hours and Earnings for Production Workers, May 1950, in the Blast Furnaces, Steel Works, and Rolling Mills Industry

State	Employment Index (May 1949 = 100)				Average Hours and Earnings, May 1950		
	1949		1950		Weekly Earnings	Weekly Hours	Hourly Earnings
	May	Aug.	Apr.	May			
Total U.S.	100.0	93.3	97.7	99.0	$65.86	39.7	$1.659
Pennsylvania	100.0	89.8	89.6	91.4	66.71	40.6	1.643
Ohio	100.0	90.7	96.1	97.1	63.03	37.9	1.663
Indiana	100.0	100.1	112.3	113.2	69.05	40.1	1.722
Illinois	100.0	95.5	102.9	104.5	65.47	39.7	1.649
Michigan	100.0	116.4	118.5	118.1	2/	2/	2/
New York	100.0	88.1	101.1	102.9	68.67	40.8	1.683
West Virginia	100.0	98.9	100.2	100.5	67.73	40.1	1.689
California	100.0	93.3	104.1	105.1	68.18	39.8	1.713

1/ Data are based on a sample group of establishments comprising 90 percent of the industry. For U. S. totals see page 7. State totals are not available.

2/ Data not available.

May Hours Up From 1949

The industry's workweek in May--39.7 hours--remained at the same level as April but was an hour longer than May 1949. State data for May show substantial overtime being worked in individual states. New York and Pennsylvania were working at the highest levels with 40.8 and 40.6 hours per week, respectively. Ohio the second largest steel state, on the other hand, was working only 37.9 hours per week.

Hourly earnings averaged $1.66 in May as compared with $1.56 in July 1948, just prior to the third round of steel wage increases. (The two other postwar wage increases were obtained in February, 1946 and April, 1947.) The settlements made in November 1949 were concerned with pensions and fringe benefits and are not reflected in hourly earnings data. Average weekly earnings in May of $65.86 were $3.00 higher than in May of last year and $9.00 above May 1947.

May Steel Output Highest Ever

Steel production reached an all-time high of 8.5 million tons in May and continued the pace into June. The last week of June was the eleventh week of above-capacity utilization of steel furnaces, setting a new industry mark for sustained operations at capacity or better. New steel making facilities and improvements in existing plants have added 8 million tons of raw steel capacity since the beginning of 1947, according to the American Iron and Steel Institute. These additions bring United States capacity close to 100 million tons, 11 million tons greater than last year's estimated capacity of the rest of the world. Further, Iron Age estimates that capacity of steel furnaces will probably be increased an additional 2 million tons this year.

Reappearance of such record activity, absent since late 1948 and early 1949, reflected an upturn in general business conditions as well as in that of a few chief steel consumers--automobiles, construction, and oil and gas pipe line and drilling companies, and a backlog resulting from inventory liquidation and unfilled orders occasioned by successive steel and coal strikes. May automobile and truck output reached an all-time monthly high of 705,000 vehicles. Construction likewise, was running at peak levels in May with a record-breaking new construction value of $2.2 billion and 140,000 housing starts. These two industries consumed about one-third of total steel output last year.

Sheet and strip steel which comprised 12 percent of total steel shipments in 1949, line pipe for oil and gas lines and drilling, and flat rolled steel for appliance manufacture, were all in short supply during May. The recent announcement of large freight car orders is expected to add more strain to the industry's overburdened capacity.

Table II

Employment, Hours and Earnings in Blast Furnaces, Steel Works and Rolling Mills Industry, by Month, 1949 - 1950

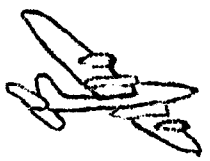
Year and Month	All Employees 1/ Number	Production and Related Workers 1/ Number	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
	(in thousands)				
Average 1947	589.0	517.6	$56.12	39.0	$1.439
1948	612.0	536.8	62.41	39.5	1.580
1949	550.4	476.7	63.04	38.3	1.646
1949					
January	626.1	550.3	66.24	40.0	1.656
February	628.9	552.8	65.64	39.9	1.645
March	628.3	551.7	64.90	39.5	1.643
April	621.9	545.4	64.69	39.4	1.642
May	610.8	533.9	63.24	38.7	1.634
June	599.1	523.0	62.21	37.7	1.650
July	581.3	505.8	59.88	36.4	1.645
August	572.0	497.6	61.33	37.6	1.631
September	572.5	498.7	62.07	37.1	1.673
October 2/	191.3	130.3	55.90	34.0	1.644
November 2/	392.3	324.8	56.48	34.4	1.642
December	580.4	506.6	64.65	39.3	1.645
1950					
January	584.8	510.5	65.83	39.3	1.675
February	587.5	512.3	64.81	39.3	1.649
March	583.3	506.9	61.84	37.5	1.649
April	599.3	522.6	65.95	39.9	1.653
May	606.5	529.5	65.86	39.7	1.659

1/ Data are based upon reports from cooperating establishments covering both full-and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month.

2/ Low October and November employment levels reflect steel strike.

AIRCRAFT

Aircraft manufacturing, which today is primarily a defense industry, maintained a stable employment level during the first five months of 1950. The number of production workers averaged 123,100, 1/ a 3 percent decline from the average of 127,300 in the like period of 1949. The decline reflects the influence of several factors. Spending by the armed forces for military aircraft in the fiscal year 1949-50 was curtailed; there was a lull in the introduction of new models; and, the fall in demand for civil aircraft continued. Shipments of military aircraft, however, registered a 9 percent increase during the first four months of 1950 as compared with the same period a year ago.1/These increased deliveries reflect the heavy armed forces' spending during fiscal year 1948-49. Though the experience in producing particular models of aircraft over a period of a year or more usually results in a reduction of manhour requirements, the introduction of armament and electronic changes in military aircraft while the model is in production prevents an accurate estimate of this trend in the short period under appraisal.



Military Aircraft Major Product

The industry is now largely dependent on airplane orders from the armed services for a continuance of operations. In 1947, military aircraft shipments comprised 39 percent of total shipments; by 1949, the percentage had increased to 82. Over this period, actual shipments of military aircraft rose sharply while those of civil aircraft were reduced to a minor total (see Table I, page 7).

1/ This excludes employment in industries producing aircraft engines, propellers, and parts.

2/ Shipments of aircraft in this article refer to airframe weights as published by the Civil Aeronautics Administration, avoiding the problem of weight differences inherent in a discussion of aircraft in terms of numbers.

Accordingly, the trend in total shipments in the past two and a half years has been closely tied to the fluctuations in military spending. The initial postwar increase in defense spending for planes was made in the 1947-48 fiscal year, according to the Bureau of the Budget. Expenditures were about 30 percent above those for the previous fiscal year. This was followed by an almost tripling of expenditures in the 1948-49 fiscal year. As a result, total shipments of aircraft in 1948 were 20 percent above 1947 despite a 45 percent fall in shipments of civil aircraft. In 1949 total shipments, still reflecting expanded military purchases, increased further (seeTable I).

The 1949-50 military purchase program set aircraft procurement at about the 1949 level (in terms of airframe pounds). The President has requested Congress to continue procurement at this level through the 1950-51 fiscal year. Barring changes in these plans as a result of recent international developments, significant fluctuations in total shipments in the immediate future are hardly to be expected from changes in civil aircraft demand.

Table I

Aircraft Shipments By Airframe Weight

(weight in thousands of pounds)

Year	Total 1/		Military		Transport		Personal	
	Weight	Percent of Total	Weight	Percent of Total	Weight	Percent of Total	Weight	Percent of Total
1946	38,265	100	12,790	33	5,480	14	20,035	52
1947	29,190	100	11,335	39	6,445	22	11,405	39
1948	35,265	100	25,180	71	4,795	14	5,285	15
1949	36,540	100	29,795	82	4,315	12	2,430	7

1/ Segments may not add to total because of rounding.

Source: Civil Aeronautics Administration

Demand For Civil Aircraft Down

The often predicted air age has not materialized thus far in the postwar period. The large demand for civil aircraft that appeared immediately after the war was quickly satisfied by accelerated shipments from factories and sales of Army surplus planes. Since 1946, demand, and therefore shipments (see Table I), have dropped steadily. The decline has been pronounced in the light plane market. In 1946, shipments of this type of aircraft numbered 33,300 in 1949 only 3,400.

A special study by the Civil Aeronautics Administration reveals that the primary factor responsible for the decline in demand for light planes is their low level of general utility. The additional factors of high cost and a variable degree of safety have also tended to depress sales. The CAA study shows that it is in the States where the planes find their greatest usefulness that per capita ownership is highest. On a per capita basis, the greatest concentration of light plane ownership is found west of the Mississippi, particularly in the Mountain States. Here, there are wide distances to travel and good flying weather. The existence of high per capita income is also of some slight significance in encouraging plane owership. In general, the planes are found concentrated in smaller cities and rural area. Commercially, extensive use for them has been found in crop dusting, seeding, and business travel, but their utility for the city inhabitant remains low. Until a plane is developed which fits the day to day needs of the latter, it appears that the major metropolitan market will remain untapped.

Employment Tied To Military Aircraft Production

The trend of employment in the aircraft manufacturing industry during the postwar period has primarily reflected military aircraft production. Following closely on the increased levels of defense spending, production worker employment rose from 104,000 in July 1947 to a peacetime peak of 130,000 in July 1949 (see Table III p.10). The reasons for the subsequent decline have already been discussed.

Total industry estimates of employment, however, tend to hide different regional trends. These derive from several factors. The industry comprises a small number of firms with the large companies predominating. The firms are located in different sections of the country and specialize in particular models of aircraft. Lastly, there is a single major customer in the market—the U.S. Government. As a result, large orders for any or several models of aircraft in a particular period may provide different regional employment trends.

This is apparent in the period from July 1949 to May 1950 (see Table II, below). The reduction in defense spending during fiscal year 1949-50, and the factor of more efficient model production, are revealed in the 4 percent decline in production worker employment for the industry as a whole. The decline was more severe on the Pacific Coast--12 percent. About one-half of the workers in the industry are employed in this region.

In the remaining regions, on the other hand, employment rose. This was particularly true in the Northeast. An additional factor here was the strike at a major producer in July 1949. Since the reopening of the plant, production has be accelerated.

Table II

Employment Index 1/, Hours and Earnings for Production Workers in the Aircraft Industry, 1949-1950

	Employment Index (May 1949 = 100)				Average Hours and Earnings, May, 1950		
	1949		1950		Weekly Earnings	Weekly Hours	Hourly Earnings
	May	July	April	May			
Total U. S.	100.0	102.2	97.3	98.1	$64.88	40.6	$1.598
Northeast	100.0	90.8*	122.0	119.1	66.09	40.3	1.640
New York	100.0	91.6	131.2	127.4	67.56	40.7	1.660
Pacific	100.0	104.4	91.6	92.3	65.03	39.7	1.638
South and Central	100.0	102.5	101.2	103.1	62.57	41.3	1.515

1/ Employment totals for the United States as a whole may be found on p. 10. State totals are not available.

* Work stoppage at plant of major producer.

Regional Differential in Earnings

The earnings figures in Table II reveal somewhat higher gross hourly earnings on the Pacific Coast and in the Northeast compared with the South and Central regions. A study by the Labor Department's Division of Wage Analysis of wage rates corroborates the existence of this pattern.

Hourly earnings for the aircraft industry as a whole rose about 14 percent on the average between 1947 and 1949. This is about the same increase as recorded by all manufacturing industries. The level of hourly earnings in the aircraft industry is expected to increase further in July. The Secretary of Labor has announced the fixing of a minimum rate of $1.05 an hour in all aircraft plants with government contracts, effective July 8.

The workweek in aircraft has been maintained at a somewhat higher level than all manufacturing since 1947. In May 1950, weekly hours in the aircraft industry averaged 40.3. This figure includes some overtime. Moreover, most of the industry is working more than a single shift.

Table III

Production Worker Employment in the Aircraft Manufacturing Industry, by Month
1947 - 1950

Month	Year			
	1947	1948	1949	1950
Average	110,900	111,500	126,600	
January	120,300	109,300	126,800	122,900
February	117,900	110,300	126,600	122,400
March	116,300	111,200	128,200	122,200
April	118,800	112,100	128,000	123,600
May	112,300	99,000*	126,700	124,600
June	108,500	101,600	127,200	
July	104,100	104,700	129,500	
August	104,800	109,800	128,600	
September	104,100	112,300	127,600	
October	106,700	118,900	125,400	
November	108,300	123,400	122,300	
December	108,100	125,400	122,700	

* Strike at the plant of a major producer. Stoppage lasted 142 days.

SYNTHETIC FIBERS*

.... Shipments at Record High

Substantial textile recovery through mid-1950 and continued high output of rayon tire-type fibers have placed June's 54,100 production work-force in the synthetic fiber industry at the highest level in 15 months. By contrast, the 1949 employment trend was downward to a post war low of 47,700 workers in July, general layoffs resulting from excessive inventories. The average workweek in June was 39.3 hours, more than one hour longer than the workweek in mid-June of last year and almost 2 hours greater than the postwar hourly low in April 1949.

Domestic deliveries of rayon (about 92 percent of all synthetics) for the 6-month period through June 1950 were almost half-again as large as shipments in the corresponding period of the previous year. The recovery was attributed mainly to textile-type rayon; tire-type rayon fiber output remained stable. In fact, in the declining 1949 period, when output of rayon dropped 12 percent, deliveries of tire-type rayon filaments rose.

The synthetic fiber industry is currently producing greater poundage than in the high 1948 period despite a substantial decline in employment since that time. Although the precise reasons for such lowered manhour requirements since 1948 are not known, they may be accounted for by a combination of the following factors: differing product output, such as larger proportions of coarse rather than fine fibers, possibly reduced manhours utilization in newer non-cellulose synthetics, technological improvements, and improved worker efficiency.

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* The synthetic fiber industry (SIC 2825) is comprised of establishments primarily engaged in manufacturing rayon, nylon, and other synthetic fibers, except glass, to be used as material for further manufacturing.

Synthetics Recover High Level

June rayon shipments of 103 million pounds continued the high level which has characterized 1950, according to the Textile Economics Bureau. For the first 6-months a half-yearly record was attained as 605 million pounds of rayon were delivered including the all-time monthly peak of 106 million pounds in March. This recovery followed a 1949 downtrend when rayon output dipped 12 percent, the first decline in an otherwise uninterruped 10-year climb.

High automobile output in 1949 stimulated a 10 percent gain in tire-type rayon over the previous year. In 1950 these same yarns were averaging 25 million pounds monthly, approximately the same output as in 1949, but a tremendous gain from the less than one million pounds produced monthly in the prewar period. Likewise, textile demand was improving. Rayon textile-type deliveries rose 67 percent for the first 6-months of 1950 compared with the same period last year, reflecting increasing use in men's suitings, women's wear and other textile products.

Despite the 1949 reduction in rayon, production of the newer nylon and other non-cellulose synthetic fibers in that year increased one-fifth to an output of 91 million pounds. In 1949, these new fibers accounted for about one-tenth of all synthetics whereas prior to the war, they were produced only in nominal quantities. An illustration of the constant change among the various synthetic segments is afforded by an intra-industry shift in women's hosiery which has seen low denier nylon practically replacing rayon.

In April of last year, rayon producers' inventories totaled 63 million pounds, which were greater than deliveries in that month. This contrasts sharply with end-of-April stocks in other postwar years which averaged only about one-sixth of monthly shipments. It was not until early 1950 that inventories returned to a more normal balance.

Use of synthetics and blends of synthetics and natural fibers has grown so rapidly that between 1939 and 1949, the proportion of total cotton, wool, silk and synthetic fiber consumption accounted for by synthetics increased from 10 percent to 20 percent of the total, according to the Textile Economics Bureau. Extremely important factors in the sensational growth of rayon (in commercial production in U. S. since 1909) have been its relatively low price as compared with that of the natural fibers, as well as the possiblity of greater product control and the chemical uniformity of synthetics.

Employment Stable This Year

June's 54,100 production workers in the synthetic fiber industry was only 400 employees above the May level, but 5,700 workers more than in June 1949. From a high of 60,600 production workers in October 1948, layoffs brought employment to a postwar low of 47,700 in July of 1949. Starting with August, however, there was a steady upward trend until the end of 1949 when employment stabilized at current levels.

The June hiring and separation rates of 1.9 and 0.8 percent respectively, stamp the industry's workforce as one of the most stable in all manufacturing. Accessions for all soft goods factory workers in June averaged 3.9 percent and separations 2.6 percent.

State Year-to-Year Trend Upward

The South contains about three-fourths of the industry's employment; Virginia and Tennessee accounting for one-fourth and one-fifth respectively, of the United States total. Employment in the industry as a whole rose 12 percent from June 1949 to June 1950, with an unusually large gain of 16 percent reported in Tennessee.

Table I

Employment Index 1/, 1949-1950, Hours and Earnings for Production Workers, June 1950, in the Synthetic Fibers Industry

	Employment Index (June 1949 = 100)			Average Hours and Earnings June, 1950		
	1949 June	1950 May	1950 June	Weekly Earnings	Weekly Hours	Hourly Earnings
Total U. S.	100.0	111.0	111.8	$57.73	39.3	$1.469
South	100.0	110.2	111.1	57.25	39.4	1.453
Virginia	100.0	103.3	103.7	58.48	39.7	1.473
Tennessee	100.0	112.5	115.6	57.11	39.8	1.435
North	100.0	114.1	114.4	59.12	39.1	1.512

1/ Data are based on a sample group of establishments, comprising 80 percent of the industry. For U. S. totals see Table II. State totals are not available.

Hours up from Last Year

The average workweek in June 1950 was 39.3 hours, about one hour ahead of last June and considerably higher than the low of 37.5 hours in April 1949. The June workweek is about the same as the 1947 and 1948 annual averages. Regional figures indicate that some overtime was being worked particularly in Tennessee and Virginia.

Hourly earnings in June average $1.47 showing little change over the past year. The current level however is 20 cents above June 1947. Average weekly earnings of $57.73 were at an all-time high. Northern earnings in June were almost $2.00 per week higher than those in Southern plants, despite a somewhat shorter workweek in the North.

Table II *

Employment, Hours and Earnings of Production Workers in the Synthetic Fiber Industry, by Month 1949-1950

Year and Month	Number (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Average 1947	57.9	$49.02	39.5	$1.241
1948	59.9	53.05	39.5	1.343
1949	52.7	55.20	38.6	1.430
1949				
January	60.0	55.55	39.2	1.417
April	51.8	53.63	37.5	1.430
July	47.7	55.13	38.1	1.447
October	52.1	55.63	38.9	1.430
1950				
January	53.5	56.45	39.2	1.440
February	53.5	55.99	39.1	1.432
March	53.6	55.97	39.0	1.435
April	53.8	56.52	38.9	1.453
May	53.7	57.35	39.5	1.452
June	54.1	57.73	39.3	1.469

* Data are based upon reports from cooperating establishments covering both full-and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month

RAILROAD EQUIPMENT

Employment in the railroad equipment industries 1/ increased during the second quarter of 1950, and thus reversed a decline which had prevailed for more than a year. The increase reflected higher locomotive and freight car production. Underlying the latter movement were the substantial orders resulting from the continued replacement of steam locomotives by Diesel units and the purchase of freight cars by the Equitable Life Assurance Society for leasing to several railroads.

Further orders for rolling stock may appear as a result of the current negotiations for additional orders of freight cars and locomotives based on leasing arrangements, the rising level of business activity, and the high rate of railroad car retirements so far this year. Railroad car retirements are now averaging about 6,000 per month. In addition, the industry will probably benefit from orders for special equipment to fill defense needs. During World War II, the industry built tanks, prime movers, and special railroad cars designed for troop movements.

Between the two World Wars, this industry was characterized by a long-term employment decline. World War II and the immediate postwar boom reversed this trend. The reappearance of the downward trend was suggested in 1949 when railroad car orders dropped to insignificant levels, but in 1950 orders once more turned upward.

1/ These are the locomotive and parts manufacturing (SIC 3741) and the railroad and street car manufacturing industries (SIC 3742). Similar manufacturing activities which occur in railroad owned shops are excluded.

Railroad and Street Cars 2/

The independent railroad car building industry added approximately 6,000 production workers to its workforce in the second quarter of 1950 as a rise in freight car orders stimulated production. Employment in June totaled 30,000 3/, a drop of about 40 percent from average employment in 1947 and 1948 (see Table II p.).

The stream of new orders reflected primarily a novel plan for the financing of freight car production. Under this plan, the Equitable Life Assurance Society purchases new freight cars and leases them to the railroads. The roads will thereby receive the immediate benefits of reduced repair costs and improved rolling stock while their working capital remains untapped.

Though orders of 27,000 freight cars to independent shops in the first six months of 1950 were substantially above the total of about 3,000 made in the first half of 1949, they were only a bit more than one-half the number ordered in the like period of 1947. Orders received in 1947 and 1948 covered the backlog of domestic demand and the emergency needs of foreign countries (see Table I below). Widespread currency devaluation abroad has since made the prospects of further large foreign sales rather dubious.

Table I

Year	Domestic Orders	Deliveries	
		Domestic	Export
1946	48,000	32,000	18,000
1947	93,000	53,000	28,000
1948	58,000	83,000	2,000
1949	4,000	63,000	3,000
1950 (6 mos.)	27,000	7,000	200

Source: American Railway Car Institute

2/ The analysis is limited to freight car production since it constitutes by far the most important product of the industry. In 1949, the industry produced 63,000 freight cars, 1,045 passenger train cars, 684 transit cars, and 1,430 trolley coaches.

3/ Workers employed in railroad owned shops are excluded.

The decline of orders in 1949 signified a temporary reassertion of the long-term downward trend in the level of the industry's operations. This trend is illustrated by the reduction of the production-worker force from 80,000 in 1923 to 24,000 in 1939, and results from the dependence of the car manufacturing industry on one major customer--the Nation's railroads.

Table II

Production Worker Employment in the Railroad and Street Car Manufacturing Industry, by Month, 1947 - 1950

Month	1947	1948	1949	1950
Average	50.3	51.2	43.3	
January	46.9	51.9	52.9	28.4
February	48.8	50.3	53.1	27.0
March	49.7	50.6	52.2	25.9
April	50.9	50.0	49.6	24.7
May	50.4	50.1	48.7	28.4
June	50.5	51.6	47.2	30.8
July	50.2	51.4	43.5	
August	49.9	51.1	39.7	
September	51.0	51.1	37.7	
October	50.8	50.8	34.2	
November	52.2	52.4	31.1	
December	52.4	52.8	30.2	

Locomotive and Parts Industry

The locomotive manufacturing industry responded to the spurt in orders during the first half of 1950 by lengthening the workweek rather sharply. Average weekly hours in January 1950 were 39.0; by May 1950, they had risen to 40.9. In June weekly hours dropped to 39.5 reflecting the working down of order backlogs and a slight enlargement of the workforce.

The industry added 600 workers in the second quarter of 1950. June employment totaled 20,400, about 20 percent below the 1948 average of 25,800 (see Table IV p.10), but more than double the 1939 level of 6,000. Between 1923 and 1939 employment fell from 30,000 to 6,000.

The number of locomotives ordered in the first six months of 1950 was approximately double that for the comparable period a year ago. However, unfilled orders, on January 1950 were about 50 percent below the level of January 1, 1949.

The peak in postwar locomotive orders was reached in 1948. The following year a rather sharp reduction in demand from both domestic and foreign sources occurred (see Table III below). Data for the first six months of 1950 indicate that the decline in this segment of railroad equipment manufacturing is not following as drastic a downtrend as the carbuilding industry.

Table III

Locomotive Orders

Year	Domestic	Foreign
1946	1,052	629
1947	2,229	655
1948	2,717	435
1949	1,808	115
1950 (6 mos.)	1,229	1/

1/ Not available.
Source: Railway Age

The limited decline in locomotive orders reflects continuation of the Dieselization program whereby railroads have been achieving greater economics of operation than with steam locomotives. In 1949, 1,865 new locomotives were installed, only 57 of which were steam. Today Diesel locomotives provide a major share of railroad service.

Diesel Service as Percent of Total Service,
1940 and 1949

	Passenger Service	Freight Service	Yard Service
1940	5.2	.05	9.4
1949	49.3	34.9	50.8

Table IV

Production Worker Employment in the Locomotive and Parts Manufacturing Industry, by Month, 1947 - 1950

Month	1947	1948	1949	1950
Average	25.4	25.8	22.7	
January	26.6	26.5	25.7	19.6
February	27.0	26.6	25.8	19.9
March	26.0	26.8	25.8	19.6
April	25.1	26.7	25.1	20.0
May	23.8	26.5	24.4	20.5
June	24.3	26.4	23.8	20.4
July	23.7	26.4	22.6	
August	24.4	17.7	12.2	
September	25.1	27.0	22.1	
October	25.9	26.4	21.9	
November	26.1	26.4	21.7	
December	26.4	26.5	21.7	

Hours and Earnings in the Equipment Industry

Hourly earnings in the locomotive building industry in June 1950 were $1.72. This was higher than the figures for carbuilding ($1.576) and for all manufacturing ($1.719) (see Table V p. 11) and is explained primarily by the highly skilled work required in locomotive manufacturing.

As stated above weekly hours in locomotive manufacturing during June were 39.5, and in carbuilding 38.7. The average for all durable goods industries, however, was 41.4. Thus, the two equipment industries are part of a group in durable goods manufacturing where overtime can be expanded substantially to meet any defense orders.

Table V

Hours and Earnings, June 1950

	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
All manufacturing	$58.89	40.5	$1.454
Railroad and street cars	60.99	38.7	1.576
Locomotives and parts	67.90	39.5	1.719

Equipment Manufacturing and the Railroads

The level of employment in the railroad equipment industries reflects the size of orders placed by the Nation's railroads. Thus, in 1948, employment in the equipment industries registered 24-year record highs as the result of large postwar orders placed by the roads. These orders reflected the program for replacing obsolete stock and for meeting war deferred needs which was facilitated by the high level railroad earnings during the war and immediate postwar periods. Prospects of lowered earnings in 1949 as well as the filling of deferred needs explain the subsequent drastic reduction in orders and the resulting employment decline in the equipment industries. Possible defense orders and a generally high level of economic activity may change this picture.

Over the past quarter of a century, however, the trend of employment in the equipment industries has been steadily downward. Underlying the reduction are two major factors; the relative decline of railroads as a transportation medium and the improvement and more efficient use of railroad equipment.

In 1926, the railroads carried 77 percent of commercial inter-city freight traffic; by 1949 this had fallen to 62 percent (see table VI p. 12). The decline has been even more marked in the field of passenger traffic; in 1926 the railroads carried 75 percent of commercial inter-city passenger traffic, in 1949 only 54 percent. Table VII page 12 which describes the percentage distribution of passenger traffic does not show the depressing impact of increased automobile usage on total commercial traffic.

Table VI

Percentage Distribution of Commercial Intercity Freight Traffic in the United States

	1926	1940	1943	1944	1947	1948	1949
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Steam railroads	76.8	62.3	72.7	70.0	67.5	64.4	61.5
Great Lakes Shipping	14.1	14.4	10.3	9.9	10.3	10.7	11.0
Rivers and canals	1.6	3.7	2.6	3.0	3.5	4.3	4.6
Motor trucks	2.8	8.4	4.8	4.6	8.0	8.7	10.5
Oil pipe lines	4.4	11.1	9.5	12.4	10.6	11.8	12.3
Air carriers	0.3	0.1	0.1	0.1	0.1	0.1	0.1

Source: Association of American Railroads.

Compared with 1926 railroads today are carrying more freight traffic with fewer freight cars. This is illustrated by the 73 percent increase in the ton-miles performance for each freight train hour over this period.

The effect of these factors of increasing competition and improved efficiency is to reduce the railroad's need for new equipment. Attempts to achieve economies by improving efficiency, however, do provide large short-term equipment orders as exemplified by the dieselization program currently underway.

Table VII

Percentage Distribution of Commercial Intercity Passenger Traffic in the United States

	1926	1940	1943	1944	1947	1948	1949
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Steam railroads	75.2	61.5	72.8	74.4	58.5	56.3	54.0
Electric interurban	11.7	2.4	1.6	1.6	1.0	0.9	0.9
Inland waterways	3.9	3.4	1.6	1.7	2.3	2.4	2.6
Buses	9.2	30.0	22.7	20.6	30.4	32.3	31.9
Air carriers	-	2.7	1.3	1.7	7.8	8.1	10.6

Source: Association of American Railroads

SHIPBUILDING & REPAIR

The shipbuilding and repair industry is again in the limelight as a result of hostilities in Korea and the gravity of the general international situation. Historically our troops have fought at great distances from the United States, and war has called for enormous reactivation of what normally is a small shipbuilding program. Each time the problems have been planned expansion under emergency conditions, construction of new facilities, recruitment of management and, for the most part, inexperienced labor.

Hostilities in Korea conform, in a geographical sense, to our past involvements. For example, fighting requires the transport of thousands of men and supplies vast distances chiefly via the water route. But many elements in the immediate situation obviously differ from the previous pattern and these differences are currently shaping the outlook in the shipbuilding industry.

1. The number of men to be transported runs into thousands rather than millions. The transport of equipment to maintain these forces is scaled down in similar proportion.

2. Thus far our ships have plied the sea lanes without reprisal, thereby virtually eliminating the replacement or repair functions growing out of enemy action.

3. The United States entered this action with a lay-up fleet of almost 2,300 merchant vessels from the shipbuilding program of World War II. Of these, 1,500 are Liberties, less than 300 are Victories, and the rest are of miscellaneous types. These vessels, anchored in eight reserve fleet locations around the country, are not in uniform repair. Some can be commissioned with little or no additional work; others require a greater degree of overhauling. All ships, however, are seaworthy and capable of being reactivated in a relatively short time.

4. The U. S. Navy has been called on for convoy work, and major elements of the Pacific fleet are implementing the President's announced policy of policing Formosan waters. But

in general, the regular Navy has required little of the "mothball" fleet. As a result, no extraordinary demands are being made upon the Navy yards and little if any naval work is being farmed out to private shipyards.

5. Finally, the United States still has vast unutilized yard capacity. This capacity represents ways in private yards and Navy yards, four large Maritime Commission emergency reserve yards, and that capacity in all yards which can be brought into use through a lengthened workweek and stepped-up shift operations. Therefore, the problem of new construction and repair would be simplified if increased activity should again become necessary.

Ship Requirements Caused by the Korean War

Thus far practically no new construction has been created by the exigencies of the Korean situation. Instead the present job is one of reactivation of standby elements of the fleet and merchant marine. All of our shipping needs, with the possible exception of an insignificantly small number of special-purpose craft are already in active or standby status. The President's supplemental spending program calls for a Navy appropriation of $3.7 billion for expansion and war operations. Two big and two small aircraft carriers and hundreds of other ships are to be "de-mothballed" and put into service. Thirty one vessels are to be modernized or converted to other uses. New construction is to be held to a minimum. One small submarine and more than 100 landing craft and other small vessels are to be laid down.

With the outbreak of the Korean war, the Maritime Commission began renovating ships of its reserve fleet. The fastest merchant ships and those in the best repair state were the first to be withdrawn from the reserve. These two criteria were met by the Victory ships. They were built toward the end of the last war, have been in the reserve the shortest time, and consequently were in the best condition. This accounts for the speed with which these vessels were refitted and placed on the active list. Similar speed, of course, cannot be expected in subsequent withdrawals although most of the reserve vessels are in highly satisfactory condition.

Industry Status Just Prior to Korean Incident

The shipbuilding and repair industry in June 1950, just prior to Korean hostilities, employed 135,000 workers (table I). These workers were almost evenly distributed between private yards and Navy yards. Approximately two-thirds of the industry's workers were in Atlantic Coast yards. Geographical concentration was the same in both the private and Navy segments.

Current employment is only a twelfth of World War II volume, but it by no means represents a record low. In 1923, 90,000 workers were employed in all United States shipyards. The level remained fairly constant during the next 8 years but started downward in 1932. By April 1933 only 49,000 shipyard workers were employed. Under the authority of the National Industrial Recovery Act, an appropriation of $238 million was made in 1933 for the construction of naval vessels. With this stimulus, shipyard employment rose almost steadily for the next 6 years, except for an interruption in 1938. Additional appropriations were made within this period for vessels, and a long-range merchant vessel program also was begun.

By June 1940, the beginning of the Defense Program, shipyard employment had increased to 168,000 and in December 1941 it was 556,000. After the attack on Pearl Harbor, employment more than doubled in 8 months and more than tripled in 18 months. Peak over-all employment was reached in December 1943; in United States Navy yards, the peak (333,000) occurred earlier--in July 1943.

After December 1943, employment dropped continuously to 1,189,000 on VE-Day and 1,022,000 on VJ-Day. By the end of 1945, it was about a half-million. A year later, in January 1947, employment had again been reduced by half to 251,000. The trend in the last 3½ years has been uneven but fairly consistently downward.

Adequacy of Labor Supply

Virtually the entire industry in June 1950 was located in areas of substantial labor surplus, that is, areas where unemployment totaled 7 percent or more of the labor force according to the Bureau of Employment Security (table II).

Over the short-run or for a partial mobilization effort, there appears to be no question of an inadequate general labor supply. Manpower requirements are likely to be highly localized due to the small number of yards expected to share in the reconditioning process. For reconditioning merchant ships, the number of participating yards will be determined chiefly by their proximity to fleet anchorages of the maritime reserve. It is the announced policy of the Maritime Commission to refit ships from the standby fleet as close as possible to their reserve anchorage. Examination of the eight fleet anchorages, therefore, provides an indication of the areas where additional manpower recruitment will take place:

James River, Va. (Near Norfolk, Hampton Roads, Baltimore)
Wilmington, N.C. (Probably Norfolk-Hampton Roads, Baltimore)
Hudson River, N.Y. (New York City, Camden)
Mobile, Ala. (Mobile, New Orleans)

Beaumont, Tex. (Orange, Galveston, Houston)
Susan Bay, Calif. (San Francisco)
Astoria, Ore. (Probably Seattle, Tacoma)
Olympia, Wash. (Seattle, Tacoma)

The size of the Navy's announced requirements makes it appear that most of its work will be done in the Navy yards.

Preliminary reports received from private yards indicate that approximately 13,000 workers were added to the industry's payroll between mid-July and mid-August. Navy yard data are not yet reported but the increase is expected to be several thousand workers over the same period.

Table II. - Employment in the Shipbuilding Industry 1/ Classified by Adequacy of Area Labor Supply 2/, June 1950

Relative Unemployment Classification 2/	Employment		
	Total 1/	Private 1/	Navy 1/
Total	123,300	54,900	68,400
A	700	700	-
B	200	200	-
C	11,200	1,400	9,800
D	94,800	40,300	54,500
E	6,400	6,400	-
Un	10,000	5,900	4,100

1/ Includes only 83 percent of employment in private yards.
2/ Explanation of classification codes:

C Code	Ratio of unemployment to labor force (in percent)	Definition of Code
A	Under 3	Tight or balanced labor supply
B	3 - 4.9	Slight labor surplus
C	5 - 6.9	Moderate labor surplus
D	7 - 11.9	Substantial labor surplus
E	12 and over	Very substantial labor surplus
Un	-	Unclassified

Commercial Yards Equally Divided Between New Construction and Repair

Even prior to the Korean war, interest was considerable in the industry as to the types of activity carried on in private commercial yards. Although general knowledge was available as to which yards did repair work and which did new construction, no clear-cur information was given out as to the distribution of these activities around the country. In addition, there were reports that many shipyards were in such dire straits that they were turning to fabrication of other products in an attempt to show a favorable operation. The Department of Labor conducted a survey in June 1950 of all commercial shipyards to determine the proportion of employment in new construction, repair, and other activities. Replies were received from respondents accounting for 85 percent of the industry's employment. About 43 percent of the workers in June were engaged in repair activities, 40 percent in new construction, 7½ percent in other activities, and the remainder were unallocable.

Many of the larger yards frequently engaged in types of activity other than shipbuilding and repair; most of them did either repair or new construction but not both. The pattern among the smaller yards was unclear but no evidence indicated a substantially different pattern from that of the larger yards.

There were some noteworthy regional variations. North Atlantic yards accounted for 55 percent of total employment, but reported 70 percent of all new construction. Gulf yards, on the other hand, with 15 percent of total employment, accounted for 26 percent of all repair work (table III).

The scope of activities other than shipbuilding and repair was relatively small, although it had increased over the last 6 months. In December 1949, only 6.0 percent of those employed were engaged in other activities. By June 1950, this proportion had grown to 7.5 percent. Insofar as information was available, some of the comments are worth noting: "Fabricating steel parts", "machinery and steel fabrication", "machining work", "miscellaneous copper piping", "crusher machinery", "steel structural work", "metal work", "mining machinery", "gray iron castings", "canvas hatch tents", and "boiler shop and machine shop products".

Hours Low but Earnings High

The private shipubilding and repair industry was on relatively short hours during June 1950 just prior to American participation in Korean hostilities. The workweek averaged 38.0 hours, fully 3 hours below the average for all durable goods. Among the private yards, workers on repair activity averaged even less--37.0 hours.

Weekly earnings for the industry, however, at $63.00 were relatively high. In June, hourly earnings averaged $1.66, or 14 cents an hour more than the average for all hard-goods industries. It is this rate (partly attributable to the high proportion of skilled workers) which places the shipbuilding industry in its advantageous competitive position with respect to labor recruitment.

Nevertheless, differences exist both by type of activity and by region. During June, hourly earnings in private yards for new construction averaged 3 to 4 percent higher than yards doing repair work. Hourly rates were highest on the Pacific Coast, and lowest in the Gulf area.

Table II.-Employment in Shipbuilding and Repair, 1940 - 1950

Year and Month	Total	Year and Month	Total
1940	180,300	1945	1,033,900
1941	377,000	1946	354,100
1942	1,004,000	1947	224,000
1943	1,655,500	1948	213,900
1944	1,568,600	1949	171,800

	1947	1948	1949	1950
January	250,800	230,100	196,800	138,100
February	245,700	227,600	194,700	138,400
March	245,100	225,900	192,000	136,000
April	249,100	223,500	186,400	133,900
May	243,900	218,900	183,500	132,500
June	242,700	212,300	176,500	134,900
July	189,100	208,400	173,200	
August	186,600	205,900	166,700	
September	193,800	204,800	158,800	
October	199,900	205,400	146,100	
November	215,900	202,700	145,600	
December	224,800	201,600	142,500	

Table III. Shipbuilding and Repairing: Production Worker Employment, Hours, and Earnings 1/ by Region and by Activity December, 1949 and June, 1950.

Region and Activity 2/	Production Workers (000)		Average Weekly Earnings		Average Weekly Hours		Average Hourly Earnings	
	June 1950	Dec. 1949	June 1950	Dec. 1949	June 1950	Dec. 1949	June 1950	Dec. 1949
United States 1/	55.9	60.5	$62.70	$62.66	37.7	37.7	$1.663	$1.662
Ship Construction	22.1	25.2	64.85	64.59	38.6	38.7	1.680	1.669
Ship Repair, etc.	23.9	25.9	59.83	59.04	37.0	36.4	1.617	1.622
Other Activities	4.5	3.6	68.76	70.29	39.0	39.6	1.763	1.775
Not Allocable (Maint.)	5.4	5.8	60.83	66.39	35.7	38.4	1.704	1.729
Atlantic	37.4	39.7	64.63	65.07	38.4	38.6	1.683	1.686
Ship Construction	18.9	23.0	65.81	64.94	38.6	38.7	1.705	1.678
Ship Repair, etc.	13.2	11.4	63.06	63.27	38.5	38.0	1.638	1.665
Other Activities	2.1	1.9	63.06	66.87	38.9	39.9	1.621	1.676
Not Allocable (Maint.)	3.2	3.4	65.68	71.85	36.9	39.5	1.780	1.819
Gulf	8.3	9.7	51.84	51.43	35.8	34.8	1.448	1.478
Ship Construction	0.8	0.3	57.00	52.81	39.5	35.9	1.443	1.471
Ship Repair, etc.	6.3	8.1	51.01	51.25	35.4	34.7	1.441	1.477
Other Activities	0.3	0.2	54.83	56.06	36.8	39.2	1.490	1.430
Not Allocable (Maint.)	0.9	1.1	52.22	52.17	35.0	34.8	1.492	1.499
Pacific	5.1	5.9	64.43	65.33	34.2	35.7	1.884	1.830
Ship Construction	0.2	0.1	66.56	59.48	38.1	37.2	1.747	1.599
Ship Repair, etc.	3.1	4.1	62.54	62.83	32.9	34.2	1.901	1.837
Other Activities	1.1	0.8	75.06	74.73	40.4	39.9	1.858	1.873
Not Allocable (Maint.)	0.7	0.9	54.95	69.12	28.8	38.7	1.908	1.786
Great Lakes	1.8	2.7	59.76	56.17	40.0	37.4	1.494	1.502
Ship Construction	0.6	0.4	53.65	55.47	39.1	37.3	1.372	1.487
Ship Repair, etc.	0.8	2.0	65.12	56.70	40.3	37.3	1.616	1.520
Other Activities	0.1	0.1	59.32	55.76	39.0	37.4	1.521	1.491
Not Allocable (Maint.)	0.3	0.2	58.58	52.28	41.4	38.5	1.415	1.358
Inland	3.3	2.5	65.60	67.77	37.9	39.4	1.731	1.720
Ship Construction	1.6	1.4	61.42	63.91	38.1	39.4	1.612	1.622
Ship Repair	0.5	0.3	61.16	64.22	37.8	40.7	1.618	1.578
Other Activities	0.9	0.6	79.84	82.58	38.2	38.9	2.090	2.123
Not Allocable (Maint.)	0.3	0.2	52.16	55.61	35.9	39.0	1.453	1.426

1/ Employment and hours and earnings differ slightly from previously published data for June because of differences in sample coverage. Figures in the above tabulation are based on a special survey of firms with 84% of production-worker employment in private yards.

2/ The regions are defined as follows:
North Atlantic: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont.
South Atlantic: Georgia, Virginia, North Carolina, and South Carolina.
Gulf: Alabama, Florida, Louisiana, Mississippi, and Texas.
Pacific: California, Oregon, and Washington.
Great Lakes: Illinois, Michigan, Minnesota, New York, Ohio, Pa. and Wisconsin
Inland: All other States.

BUILDING MATERIALS

During August, industries manufacturing building materials 1/ continued the expansion which has characterized their operation since the beginning of the year. Total production worker employment in the industries surveyed rose 19 percent from 764,000 in January 1950 to 908,000 in August (see table I). Between January and July physical production of most materials has risen substantially more than employment (see table II), primarily as a result of a longer workweek.

Despite the sharp rise in production, which in some cases was at or above record levels, stringencies in delivery were reported for many items. Shortages in August were most stringent for gypsum board and lath, cement, millwork, and brick, in that order. Available supplies of cement have been particularly affected by several work stoppages.

Structural Clay Products

The structural clay products manufacturing industry has expanded its workforce very quickly in order to meet the present huge demand for brick, sewer pipe, and tile. Reversing the employment downtrend which persisted from November 1948 to February 1950, the industry between February and August of this year added 10,600 workers. This raised its production worker total to 78,900 for a gain of 16 percent. The August employment level, however, is still slightly below the November 1948 postwar peak of 79,200.

1/ This study includes the following manufacturing industries which most directly reflect construction activity: sawmills and planing mills; millwork, plywood, and prefabricated structural wood products; structural clay products; hydraulic cement; concrete, gypsum, and plaster products; and heating apparatus and plumbing supplies.

Table I

Production Worker Employment in Selected Industries Manufacturing Building Materials, 1947 - 1950
(in thousands)

Year and Month	Sawmills and Planing Mills	Millwork, Plywood and Prefabricated Structural Wood Products	Structural Clay Products	Hydraulic Cement	Concrete, Gypsum and Plaster Products	Heating Apparatus and Plumbing Supplies
Monthly Average						
1947	455.4	100.0	70.2	33.0	71.5	146.0
1948	442.0	105.0	76.5	35.5	76.4	137.1
1949	401.3	95.7	72.5	36.0	72.4	106.0
1949 January	386.9	97.5	75.8	35.9	72.9	117.2
February	379.5	95.3	74.5	35.8	71.1	112.3
March	384.8	93.5	73.4	35.7	70.7	107.8
April	388.6	93.6	72.9	36.0	70.3	103.0
May	398.5	91.9	72.8	36.2	71.2	97.2
June	410.3	93.7	72.8	36.6	71.2	93.6
July	407.1	91.9	72.1	36.9	71.5	91.8
August	414.5	94.6	72.1	36.7	73.5	99.7
September	416.0	95.7	72.1	36.5	74.9	109.6
October	413.8	98.1	71.0	34.8	74.6	116.2
November	412.1	100.7	69.7	34.8	73.9	113.0
December	403.5	101.9	70.5	36.4	73.1	111.1
1950 January	381.1	101.6	68.6	35.8	69.5	107.4
February	385.7	101.2	68.3	35.0	71.3	112.3
March	399.3	101.7	68.5	34.5	71.3	114.0
April	409.9	104.4	68.6	35.4	73.5	117.7
May	429.8	106.2	72.8	36.0	76.4	118.6
June *	440.9	108.4	75.5	36.5	80.0	121.7
July *	444.1	108.8	76.4	36.0	81.4	120.0
August *	459.6	115.4	78.9	37.4	84.9	131.8

* Preliminary

The relative gains in production between February and July of this year have been even larger than the 16 percent registered by employment. Following a seasonal contraction between October 1949 and February 1950, production was swiftly accelerated with the onset of the building boom in 1950 (see table II). In five months, from February to July 1950, output increased, as follows:

Unglazed brick	62 percent
Vitrified sewer pipe	29 percent
Unglazed tile	30 percent

These gains were made possible by rising employment and expansion of the workweek from 38.6 to 40.8 hours.

Despite the particularly large increase in brick production, shipments for the first half of the year slightly exceeded output. In fact, some local shortages of brick have been reported.

Prices for brick and tile, like other building materials, after remaining relatively stable during 1949, rose by more than 2 percent in the first seven months of this year to a new postwar peak (see table III).

Plumbing and Heating Materials

The plumbing and heating supplies' industry, like other building material suppliers, has staged a remarkable comeback from its 1949 recession. The severity of its employment decline--from a postwar peak of 146,000 in 1947 to 106,000 in 1949--was without parallel among any of the other building materials, reflecting, in part, the substantial inventories accumulated in 1947. The decline is noteworthy in another respect. Whereas employment in most other building materials did not reach a peak until 1948, plumbing and heating employment achieved its highest level one year earlier. During the first eight months of 1950 employment increased 23 percent. The number of production workers totaled 132,000 in August (see table I).

The prices of plumbing and heating apparatus have not fluctuated very widely over the past year and a half. A gradual price decline amounting to 5 percent began early in 1949 and terminated in February 1950. Prices again started upward in March and by the end of August were 4 percent above the 1948 peak month.

Table II

Indexes of Production for Selected Building Materials, 1947-1950
(1947 Monthly Average = 100)

Year and Month	Lumber	Structural Clay Products: Brick	Structural Clay Products: Sewer Pipe	Structural Clay Products: Tile	Portland Cement	Gypsum Board and Lath
Monthly Average						
1947	100.0	100.0	100.0	100.0	100.0	100.0
1948	101.9	116.2	107.9	98.7	110.0	134.5
1949	90.6	107.6	109.6	103.9	112.5	118.8
1949 January	75.7	93.0	105.1	93.0	98.4	--
February	69.8	82.5	103.4	94.8	88.8	--
March	90.2	95.4	113.0	110.7	99.3	120.5
April	88.7	100.4	113.3	107.8	113.9	--
May	92.7	109.7	114.7	105.1	119.7	--
June	94.3	116.7	113.2	104.6	117.7	101.2
July	82.5	107.2	95.7	113.4	121.6	--
August	99.7	121.0	114.2	113.6	120.4	--
September	97.5	117.4	111.4	103.2	123.5	119.7
October	94.7	122.2	110.5	104.3	122.9	--
November	100.0	117.3	114.2	100.7	116.1	--
December	100.3	108.5	107.8	94.7	108.9	134.2
1950 January	81.0	90.2	98.6	91.4	97.7	--
February	83.6	82.5	95.1	85.5	84.1	--
March	104.9	95.0	110.5	94.8	91.6	139.6
April	109.5	107.1	79.4 1/	92.9	116.4	--
May	121.3	131.4	115.0	109.8	128.3	--
June	121.4	137.0	129.5	111.9	128.7 1/	144.4
July	113.3	133.9	123.1	110.8	133.2 1/	--

1/ Reflects work stoppage.

Source: Bureau of the Census; Bureau of Mines; National Lumber Manufacturers Association

Hydraulic Cement

The huge volume of demand for cement over the past three years has enabled the hydraulic cement manufacturing industry to increase its workforce. Expansion of highway and dam construction has created a greater need for cement at the same time that requirements for other building materials, more closely tied to the homebuilding program, have fluctuated over a broad range. The number of production workers in the cement industry, as a result, has risen from an average of 33,000 in 1947 to 36,000 in 1949. In the first quarter of 1950 employment registered a seasonal contraction, but has since moved upward, and reached a postwar peak of 37,400 in August.

Production 2/, in the first seven months of 1950 increased about 21 percent over the comparable period in 1947, much more than can be explained by the rise of 12 percent in employment. The disparity is even greater in terms of man-hours since the length of the workweek has declined slightly. A special study by the Bureau of Labor Statistics' Division of Manpower and Productivity reveals that the increase in production between 1947 and 1949 is to some extent a reflection of increased productivity. Specifically, manhours required for each unit of output in the cement industry fell by 6 percent between 1947 and 1949.

Thus far in 1950 cement production, according to the Bureau of Mines, is running slightly above last year's peak rate. July output was, in fact, the highest on record. Nevertheless, stocks have been drawn on to keep pace with demand. This year's seasonal reduction in inventories has been particularly heavy with May to July withdrawals exceeding any in a comparable postwar period. As a consequence, local shortages have appeared in several sections of the country. Additional factors responsible for the shortages are the lack of freight cars and work stoppages in cement plants during June and July.

Prices for cement have not risen appreciably in 1950 though the August level is the highest in the postwar period. Further increases, moreover, have been announced, effective October 1.

2/ Portland cement, comprising more than 90 percent of the industry's total production, is used here to indicate the industry's production trend.

Table III

Indexes of Wholesale Prices for Selected Building Materials, 1/
1947-1950

(1947 = 100)

Month and Year	Lumber	Brick and Tile	Cement	Plumbing and Heating
Monthly Average				
1947	100.0	100.0	100.0	100.0
1948	112.7	111.4	112.7	117.9
1949	103.0	115.7	115.6	123.4
1949 January	108.0	116.1	115.7	125.1
February	107.0	116.0	115.7	124.5
March	106.2	116.0	115.7	123.8
April	104.8	114.9	115.6	123.5
May	102.7	114.9	115.6	123.4
June	101.2	114.9	115.6	123,4
July	99.8	115.4	115.0	123.4
August	99.8	115.4	115.0	123.4
September	100.9	115.6	115.0	123.3
October	101.6	115.6	116.2	123.3
November	102.2	115.6	116.2	123.3
December	102.7	115.6	116.2	123.3
1950 January	103.7	116.8	116.5	121.0
February	105.2	116.6	116.6	118.6
March	106.6	116.6	116.6	121.1
April	107.7	116.7	116.6	123.4
May	112.0	117.0	116.6	124.7
June	116.3	117.4	116.6	124.6
July	121.7	119.6	116.9	124.6
August	128.5	119.9	117.1	130.5

1/ These are the indexes of wholesale prices of the Bureau of Labor Statistics recomputed with the average for 1947 as the base.

Lumber

Lumber manufacturing, like the structural clay products industry, has had to expand its workforce quickly to meet the unexpectedly large demand for its products. The sawmills and planing mills segment of the lumber industry which according to the National Lumber Manufacturers Association provides about 70 percent of its products to the construction industry, increased the number of its production workers by 21 percent between January and August of this year. Employment was 459,600 in August, 1950; this is somewhat lower than the postwar peak of 469,700 reached in August 1948. The millwork, plywood, and prefabricated structural wood products segment, which is more closely allied to residential construction, increased its workforce by 14 percent over the first eight months of 1950. The August 1950 employment level of 115,400 was a postwar high.

Millwork production, which provides doors, frames, sash, etc., for buildings, reported increases of from 10 to 50 percent for individual items in the first seven months of 1950 as compared to the like period of 1949, according to the Bureau of the Census.

Total production of lumber for all uses reached a record level in the second quarter of 1950--the highest in 35 years. A fall in output during July reflected a holiday and the traditional vacation period of the industry.

The lumber stringency is one of the most serious among the building materials. Though, in part, due to a lack of freight cars, particularly in the Oregon area, the tightness is primarily due to the unexpected volume of demand. The shortage is most severe in hardwood flooring and millwork. In the first seven months of 1950 unfilled orders for maple, beech, and birch flooring doubled, while those for oak rose by 45 percent. However, under current economic conditions, some part of these orders may be duplications.

The scarcity of lumber as well as its characteristic price volatility has engendered a price upswing much greater than for any other building material. Between January and August of this year, the prices for lumber increased by 24 percent. The August level is at an all time peak--12 percent above the previous peak of August 1948.

Concrete, Gypsum, and Plaster Products

To meet the heavy demand for its products as a result of the building boom, the concrete, gypsum, and plaster products industry raised employment sharply in the first eight months of 1950. In August 1950, the number of production workers totaled 84,900--a 22 percent rise from the January level.

There is no available measure of the production of concrete products 3/ which are by far the major part of the above industry. Its needs are reflected, however, in the present huge demands on the cement manufacturing industry.

Gypsum board and lath, production of which provides about 10 percent of the industry's employment, is the most seriously short of all building materials, despite an all time record output in the first half of 1950. Shortages are most acute in the South and the Far West. The present heavy demand reflects not only the current building boom but also the more widespread use of gypsum products.

Employment, Hours and Earnings

The recovery in employment and hours and earnings during the first eight months of 1950 in the building materials manufacturing industries is shown in table IV. With the exception of hydraulic cement, which was already at a very high level, the upswing in employment was substantial.

The length of the workweek also reflected the brisk demand for the industries' output. Average weekly hours during August, in no case less than 40.8, indicate that all industries were scheduling a minimum of about 2 hours of overtime; the concrete, gypsum and plaster products group after adding time lost due to absenteeism, turnover, etc., appears to be working close to a scheduled 48-hour week.

Hourly earnings in the building materials industries are lower as a whole than the average of $1.54 for all hard goods industries. With the exception of cement and plumbing and heating, hourly earnings of the industries covered in the survey were at least 10 cents less than the average for all durable goods.

3/ The major concrete products are ready mix cement, concrete blocks, and concrete pipes.

Table IV

Hours, Earnings and Production Worker Employment in Selected Industries
Manufacturing Building Materials

January and August 1950

Industry	Production Workers (in thousands	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Sawmills and Planing Mills				
1950: January	381.1	$47.38	38.3	$1.237
August *	459.6	57.88	42.0	1.378
Millwork, Plywood and Prefabricated Structural Wood Products				
1950: January	101.6	56.14	42.4	1.324
August *	115.4	61.52	43.6	1.411
Structural Clay Products				
1950: January	68.6	49.52	38.6	1.283
August *	78.9	54.47	40.8	1.335
Hydraulic Cement				
1950: January	35.8	57.55	40.9	1.407
August *	37.4	61.76	42.3	1.460
Concrete, Gypsum, and Plaster Products				
1950: January	69.5	58.16	43.6	1.334
August *	84.9	66.39	46.3	1.434
Heating Apparatus and Plumbing Supplies				
1950: January	107.4	59.23	39.7	1.492
August *	131.8	65.06	42.0	1.549

* Preliminary

Labor - D. C.

ALUMINUM

The use of aluminum, the most important light commercial metal, vastly expanded after World War II. Yearly consumption since the war ended has been more than triple the 1939 level (see table I). As a result, the primary refining segment of the aluminum industry 1/, which produces the major share of raw aluminum, has had to operate near capacity since 1946.

During most of the first 8 months of 1950, both employment and production in the primary industry were at peacetime highs as the building, and transportation equipment, power transmission, and household appliances manufacturing industries consumed increased amounts of aluminum. Thus, even before the Korean crisis, civilian needs were absorbing the entire output of the industry while it operated at capacity. Though some expansion of capacity by plant additions is currently underway or in the planning stage, the increase will be circumscribed, according to the Bureau of Mines of the U. S. Department of Interior, owing to the limited supplies of surplus electric power that are available. Electric power is a basic raw material which is needed in huge volumes for aluminum production—approximately 10 KWH of energy are needed to produce each pound of aluminum.

Employment at High

Reflecting the record aluminum output, employment in August 1950 continued at the peacetime high of 9,300 production workers. Though this total was more than triple the 1939 average employment of 2,800, it was substantially below the World War II level. Employment in January 1944 is estimated to have reached 15,500.

1/ This study is limited to the primary aluminum industry which produces aluminum from alumina. The secondary aluminum industry which produces aluminum from new and old scrap is excluded.

Table I

Consumption of Aluminum
(in short tons)

Period	Consumption of Primary Aluminum	Consumption of Secondary Aluminum Recovered from Old Scrap	Total Consumption
1939	167,600	37,800	205,400
1946	575,700	90,500	666,200
1947	571,800	163,800	735,600
1948	684,600	95,600	780,200
1949	636,000	44,600	680,600

Source: Bureau of Mines, U. S. Department of Interior.

Since 1947 the trend in employment has generally been upward (see table II). Shortage of electric power rather than insufficient demand has been the major limitation on production and, thus, on employment. Only in the latter part of 1949 did any softness in demand develop, but even then insufficient power and work stoppages were of relatively greater significance in reducing the level of operations.

Working conditions in this industry severely restrict the employment of women. The reduction of alumina to aluminum, the refining process, requires high temperatures and generates unpleasant fumes. As a result, even during wartime, employment expansions could not depend on the recruitment of women. In areas of labor shortages, like the States of Washington and Oregon, it was difficult to maintain the workforce at the requisite levels. A somewhat comparable situation has arisen currently. The Point Comfort, Texas plant of the Aluminum Company of America, reopening on September 25, 1950, after the settlement of a month long strike, found its workforce depleted. Alternative opportunities of employment in the stringent industrial labor market areas of Texas had attracted many of its employees.

Table II

Production Worker Employment in
the Primary Aluminum Industry,
by month, 1947-1950

Period	1947	1948	1949	1950
		(in thousands)		
Average	7.3	7.9	7.9	
January	8.7	7.0	8.1	8.3
February	8.8	7.2	8.1	8.8
March	8.3	7.8	8.3	8.9
April	7.8	8.0	8.4	9.0
May	7.2	8.4	8.6	9.2
June	7.0	8.3	8.6	9.2
July	7.1	8.1	8.5	9.3
August	6.9	8.0	7.7	9.3
September	6.6	7.9	7.6	
October	6.4	7.8	8.3	
November	6.4	7.8	5.0	
December	6.8	8.0	7.0	

Production Also at High

The 63,500 tons of primary aluminum produced in July set a peacetime monthly record. In fact, production for the first 7 months of 1950 was also a record for any comparable peacetime period (see table III). The strength of demand for aluminum is further emphasized by a sharp reduction in manufacturers' stocks and by a sharp rise in imports. According to the Bureau of Mines, stocks were reduced by 50 percent between January and July of this year and imports in the first 6 months of 1950 were greater than the total for either the year 1948 or 1949.

Table III

Production of Primary Aluminum
(in short tons)

Period	Production	Period	Production
1939	165,500	1948	623,500
1946	409,600	1949	603,900
1947	571,800		
1949		1950	
January	53,400	January	52,000
February	49,700	February	50,400
March	54,900	March	58,700
April	54,100	April	58,000
May	56,900	May	61,900
June	54,200	June	60,400
July	55,800	July	63,500
August	52,000		
September	49,700		
October	45,800		
November	35,900		
December	41,200		

Source: Bureau of Mines, U. S. Department of Interior.

The major cause of this upsurge in demand for aluminum is the widespread business recovery, particularly in building and durable goods manufacturing. Also significant is the increased rate of military plane production thus far in 1950 as compared with the same period a year ago. Another factor increasing the pressure of demand for primary aluminum is the reduced output of secondary aluminum derived from old scrap (see table I) which can be substituted for primary aluminum in some uses. The reduction in secondary output largely reflects the reduced supplies of military scrap available since 1947. But, in addition to these, aluminum is being substituted for other metals.

Increasing use of aluminum over the past 10 years may be illustrated by comparing the trends in aluminum production and industrial production as a whole since 1939. The greater expansion in aluminum production is obvious:

Indexes of Production
(1939 = 100)

Period	Aluminum 1/	Total Industrial 1/
1939	100	100
1946	250	156
1947	350	172
1948	380	176
1949	369	161

1/ Derived from aluminum production figures of the Bureau of Mines and the industrial production index figures of the Federal Reserve Board.

The relatively greater expansion in aluminum production at the expense of other metals, principally steel and copper, stems both from its lower cost and advantages in certain uses. The price of aluminum declined 15 percent between 1939 and 1949; the price of other metals increased substantially, as follows:

Prices of Selected Metals

Metal	1939	1949	Percent of Change
	(cents per lb)		
Aluminum	.200	.170	- 15
Copper	.112	.195	+ 74
Lead	.051	.153	+ 200
Nickel	.350	.400	+ 14
Tin	.504	.992	+ 97
Zinc	.055	.128	+ 133
	(indexes: 1926 = 100)		
Hot Rolled Steel	98.1	157.1	+ 60
Cold Rolled Steel	72.8	94.3	+ 30

Many advantages are widening the use of aluminum. Its lightness has been particularly advantageous in transportation equipment in which its use means increased pay loads, and in many types of building products. Its resistance to corrosion has made it popular in tank-car construction and in chemical-equipment uses. A high level of conductivity is making aluminum a strong competitor of copper in the power transmission field. A ranking of its most important uses by industry for 1949, by the Aluminum Company of America based on that firm's own shipments, follows:

Industry	Percent of Total Shipments
Building products	18
Transportation	18
Power transmission	8
Household appliances	7
Cooking utensils	6
Machinery (general and electrical)	4
Shipments to fabricators for further processing	25
All other uses	14

Plants Near Hydroelectric Sites

The need for sustained volumes of electric power in producing aluminum has determined the location of the primary branch of the industry. Plants have been built near hydroelectric power sites in Washington, Tennessee, New York, Oregon, Alabama, North Carolina, and Arkansas. However, a plant recently put into operation at Point Comfort, Texas by the Aluminum Company of America broke with the traditional use of hydroelectric power; electricity is obtained from internal combustion engines specially designed to make use of natural gas as a fuel.

The expansion of the industry in the past 10 years has been marked by the development of the Far West (Washington and Oregon) as the major aluminum production area. Today, there are five aluminum plants operating in that area; in 1939 there were none.

Stable Hours and Earnings in Aluminum

Hours of production workers in the primary aluminum industry have been more stable than those shown by comparable series for durable-goods industries as a whole. Weekly hours in primary aluminum in the past 3½ years have closely approximated the average of 41.0 (see table IV). On the other hand, the weekly hours for durable goods industries has been more volatile with 1947 averaging 40.6, 1949 averaging 39.5, and the current level above 41.0.

Hourly earnings in the primary aluminum industry averaged $1.540 in August about the same as the average for all durable goods industries. Average weekly earnings of $62.99 were somewhat lower than the durable goods average of $64.09 due primarily to a slightly longer workweek in the latter. For most of the period since 1947, however, weekly earnings in the aluminum industry have been consistently higher than the average for durable goods owing to the operation of the industry on an overtime basis throughout the period.

Table IV

Hours and Earnings in the Primary Aluminum Industry

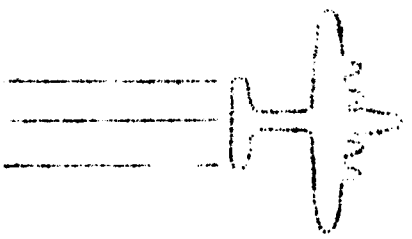
Period	Weekly Earnings	Weekly Hours	Hourly Earnings
1947	$53.46	40.9	$1.307
1948	58.95	41.4	1.424
1949	61.95	41.3	1.500
1950			
January	61.16	40.8	1.499
February	61.66	41.0	1.504
March	62.25	40.9	1.522
April	62.03	40.7	1.524
May	62.73	41.0	1.530
June	62.44	41.0	1.523
July	63.06	41.0	1.538
August	62.99	40.9	1.540

Source: U. S. Department of Labor
Bureau of Labor Statistics
Washington, D. C.
October, 1950

AIR TRANSPORTATION

Air transportation, the country's newest transport industry, is now established as an important form of passenger travel. During 1949 the industry provided transportation service for a record total of 16 million passengers. The tonnage of goods shipped by air also reached a new peak.

Employment in the industry in September 1950 was 75,300, a five-fold increase over the 15,000 employed in 1939. Employment was about 14,000 less in September 1950 than in early 1947, however, despite a substantial increase in passenger traffic between these two dates.



Recent Employment Trends

Table I, below, presents a new employment series covering the commercial airline company employees permanently stationed or receiving their pay in the United States. There was a sharp decline in airline employment during 1947, followed by a gradual leveling off in 1948 and 1949. In the first nine months of 1950, employment has been very stable, fluctuating narrowly around an average of 74,000. Excluded from these employment estimates are about 7,400 Federal employees of the Civil Aeronautics Administration who control take-offs and

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Considerable help in the preparation of this study was provided by the following organizations: Civil Aeronautics Administration, Civil Aeronautics Board, Air Transport Association of America, and Air Cargo, Incorporated.

landings at most United States airports and provide traffic and weather information. 1/ The industry is defined to include only airlines functioning as common carriers engaged in transportation of passengers, mail, and freight; it excludes charter flying and fixed-base operations such as flight instruction, sightseeing, crop dusting, etc.

Table I

Employment in the Air Transportation Industry, by month, 1947-1950 (in thousands)

Month	1947	1948	1949	1950
Average	81.7	77.9	76.7	
January	89.3	75.3	77.4	74.5
February	87.4	74.2	76.7	73.6
March	84.7	74.7	76.8	74.2
April	82.7	75.8	77.3	73.7
May	83.8	77.7	77.4	74.6
June	83.1	79.0	76.8	74.6
July	80.6	81.0	77.0	75.7
August	80.0	80.7	77.2	74.5
September	78.9	79.9	76.8	75.2
October	77.3	79.5	75.9	
November	77.3	78.8	75.8	
December	76.0	77.6	75.2	

The decline of employment which occurred between 1946 and 1949 was caused primarily by a contraction from an overly optimistic expansion in the first postwar years. The curtailment was accomplished to a large extent by such measures as consolidation of ticket sales and reservation activities as well as by reductions in flight crews and maintenance staffs.

The operation of aircraft with greater seating capacity and higher flying speeds and the introduction of improved equipment for landings during bad weather were among the factors enabling the industry to handle more passenger traffic without increasing employment during 1949 and 1950.

1/ These employees, of course, serve all planes whether personal, military, or commercial.

Since the network of major and local airlines spans the continent and reaches to thousands of scattered communities, airline employment is spread over the Nation. There are significant concentrations, however, in the States of New York, California, and Florida. These States contain important air terminals and offices, and major overhaul bases of many of the leading airlines. The 10 main States in air transportation employment are shown in Table II.

Table II

Employment in the Air Transportation Industry, June 1950

Ten Leading States

Total, U.S.	74,600		
New York	14,800	Missouri	3,200
California	11,000	Minnesota	3,000
Florida	9,300	Oklahoma	2,700
Illinois	4,600	Virginia	2,400
Texas	4,300	Colorado	2,000

Trends in Airline Passenger Traffic

Passenger traffic provides the main source of revenue for the air transportation industry. In 1949, more than 80 percent of the revenue for the certificated airlines came from this source, with freight, express, and mail accounting for the remainder. Air travel can be divided into traffic within the United States and international traffic. In addition, there is a distinction between certificated airlines operating regular schedules on specified routes and the noncertificated airlines. Certificated airlines operate regular schedules over specified routes under "certificates of public convenience and necessity" issued by the Civil Aeronautics Board. The non-certificated lines, often called "non-skeds," operate under "letters of registration" or other authority of the Board and fly irregular schedules. The non-scheduled lines operate flights when sufficient numbers of passengers can be obtained but their schedules cannot be on a regular basis, according to the regulations of the Civil Aeronautics Board.

Table III

Revenue Passenger Miles in Domestic Travel 1/,
by month, 1946-1950
(in Millions)

Month	1946	1947	1948	1949	1950
Total	5,948	6,104	5,963	6,764	
January	332	381	401	428	478
February	332	372	357	431	476
March	406	494	440	532	564
April	462	526	483	576	632
May	513	564	539	607	682
June	563	547	589	677	780
July	570	543	561	641	742
August	625	612	570	627	770
September	612	610	550	634	
October	557	579	535	609	
November	469	435	452	516	
December	508	441	486	486	

The scheduled airlines handle an overwhelming share of the air traffic, accounting for 97 percent of the revenue passenger miles in 1949. The domestic non-scheduled lines concentrate most of their flights over a few high-density routes such as the New York-Chicago-Los Angeles transcontinental route, and the vacation travel routes between New York and Florida, and Chicago and Florida. Table 3 shows the revenue passenger traffic by month from 1946 through 1950 for the scheduled airlines. The total number of passenger miles fell off between 1947 and 1948 but increased between 1948 and 1949. The year 1950 will set a new mark in revenue passenger miles. This general upward trend in the postwar years is in sharp contrast to the decline which has occurred in other forms of inter-city commercial passenger traffic (see Table IV).

1/ Noncertificated airline travel is excluded. Activity of territorial lines, which is insignificant, is included.

Table IV

Intercity Passenger Miles

(millions of passenger miles)

	1946	1947	1948	1949
Steam Railroads:				
Pullman	19,838	12,260	11,014	9,350
Day Coach	39,002	27,665	24,315	20,100
Intercity Motor Bus Lines	25,576	23,404	23,650	21,300
16 Trunk Airlines	5,903	6,011	5,823	6,580

Source: Civil Aeronautics Administration and Interstate Commerce Commission.

The introduction of air-coach service at reduced fares has undoubtedly contributed to some extent to the increases shown in 1949 and 1950. In 1949 coach fare traffic accounted for about 4 percent of the revenue passenger miles flown. During the first 7 months of 1950 coach fare travel accounted for more than 12 percent.

Domestic air passenger travel has a marked seasonal peak during the summer months. This seasonal peak results mainly from better flying weather and vacation travel. On a yearly basis, business travel provides the major volume of traffic for the certificated airlines, according to a survey made by the Civil Aeronautics Board in 1949.

Passenger travel on international routes flown by American lines has also been steadily increasing (see Table V). During 1949 the majority of passengers flew on the Caribbean and South American routes, but in passenger-miles the traffic was fairly evenly divided between these Latin American routes and trans-Atlantic routes.

Table V

Revenue Passenger Miles of American Flag Operators in International Travel, by months, 1946-1950

(in millions)

Month	1946	1947	1948	1949	1950
Total	1,100	1,810	1,889	2,057	
January	50	105	128	142	135
February	58	102	117	134	139
March	74	120	136	162	172
April	80	127	136	168	167
May	90	161	156	175	172
June	99	184	184	205	220
July	98	186	184	211	235
August	111	199	182	204	230
September	119	189	189	199	
October	111	151	166	171	
November	99	138	145	137	
December	112	148	166	149	

Source: Civil Aeronautics Board

Trends in Cargo Traffic

The most rapidly growing of the several air cargo services is freight cargo, although the volume of mail and express has also increased (see Table VI). During the first 8 months of 1950, the ton-miles of freight flown amounted to 71 million compared to 58 million during the same period in 1949. Although in most certificated airlines the transportation of freight is secondary to passenger traffic, there are four airlines which are exclusively cargo carriers. These carriers have been increasing their freight volume more rapidly than the rest of the industry. They were "non-skeds" up to October 1949, when they acquired certificated status. This change in classification accounts in part for the increase in freight traffic between 1949 and 1950 shown by the scheduled airlines as a whole.

Despite the increase in air freight transported, the total volume remains insignificant compared to the total freight traffic of all types of carriers. In 1949, freight transported by air amounted to only .1 percent of all intercity freight traffic in the United States.

Table VI

Air Cargo Operations for Certificated Domestic Carriers, 1946-1950

(in thousands)

Year	Revenue Ton Miles		
	Freight	Express	Mail
1946	14,433	23,652	32,868
1947	35,214	28,533	32,879
1948	70,438	29,769	37,510
1949	94,470	27,395	40,874
First 8 months of 1949	57,677	16,513	26,593
First 8 months of 1950	70,582	21,377	28,346

Source: Civil Aeronautics Board

The heaviest traffic flows of freight are routed between California, Texas and Florida, and New York and Illinois. A slightly heavier tonnage flows from New York and Illinois to the southern and western terminals than is shipped east. In general, shipments from the New York and Illinois areas were manufactured goods while the inflows were perishables. A great part of the latter were flowers and fruit. Some of the manufactures carried were: apparel, machinery parts, auto parts, and printed matter. The expanded defense program may well provide increased need for such high-speed freight transport.

Domestic air express and mail have also expanded in the postwar period though not as sharply as air freight (see Table VII).

On international routes, air express is most important in air cargo transport and has expanded substantially since 1946. Freight shipments are insignificant.

Table VII

Air Cargo Operations for Certificated International Air Carriers, 1946-1949

(in thousands)

Year	Revenue Ton Miles		
	Freight	Express	Mail
1946	1/	15,090	6,141
1947	2,110	30,786	12,756
1948	4,188	41.404	17,122
1949	7,967	49,377	19,364

1/ Freight ton miles for 1946 included in figure for express ton miles.

Source: Civil Aeronautics Board.

WOOLENS AND WORSTEDS

The woolen and worsted fabrics manufacturing industry reduced operations in October 1950 as demand for Spring fabrics fell. Weekly hours were cut to 39.1, or by an hour and a half from the September level; employment was reduced slightly to 114,200 over the same period. This decline reversed the upward trend which had prevailed for several months in response to a strong and early Spring order volume. Defense orders did not contribute any appreciable volume to this upturn.

The early appearance of Spring orders from apparel manufacturers was partly explained by their anticipation of a continuing world-wide shortage of wool and an accompanying price rise. Dependence of the domestic industry on foreign sources for the major share of its raw wool may hinder future operations of the industry, in view of growing shortage. It is very probable that manufacturers may resort to increased blending of wool with other fibers to spread the available supply of wool, as they did in World War II.

Trade circles expect an early rise in new orders. Factors enumerated to support this view are: a probable early increase in defense orders; the continuation of the present high level of consumer income; and a diversion of consumer spending to soft goods because of the more stringent credit restrictions placed on durable-goods purchases.

Postwar Employment Trends

Production worker employment in the woolen and worsted industry 1/ was maintained around a relatively high average of 123,000 during 1947 and 1948 (table I). Not only was National income rising during these years but heavy demand also continued for wool clothing from former soldiers rebuilding their wardrobes. However, the contraseasonal employment decline in this industry which began in September 1948 foreshadowed the general decline in business which occurred in 1949.

Table I

Production Worker Employment in the Woolen and Worsted Industry, by month, 1947-1950

(in thousands)

Period	1947	1948	1949	1950
Average	122.5	123.5	100.9	
January	130.2	127.5	111.1	102.8
February	129.3	128.9	108.0	102.8
March	125.8	127.9	95.3	103.2
April	121.5	125.9	81.3	102.9
May	117.5	124.6	88.8	103.5
June	117.2	125.0	94.0	108.8
July	114.4	119.8	97.4	106.4
August	116.1	124.1	100.6	110.8
September	121.7	122.0	104.1	114.3
October	123.0	119.2	110.8	114.2
November	125.2	119.2	110.7	- - -
December	127.5	117.9	108.5	- - -

1/ Includes all establishments engaged in weaving woolen and worsted fabrics over 12 inches in width.

Woolen and worsted employment was more affected by the general decline and the succeeding recovery than was employment in other textile industries. During the 1949 downturn, for example, employment in the woolen and worsted manufacturing industry fell 34 percent as against 17 percent in the cotton and rayon weaving industries. Similarily, during the recovery from the 1949 dip, woolen and worsted employment rose by 40 percent and cotton and rayon by 15 percent. This greater sensitivity to changed business conditions is partly explained by the high cost of wool products relative to cotton and rayon products and by the greater durability, and thus purchase postponability, of wool apparel.

The high point in the recovery from the 1949 recession was reached in September of 1950, when the woolen and worsted industry reported a production worker total of 114,300. A sharp upturn in employment between May and September added more than 11,000 workers to its payrolls, an 11 percent increase. The workweek was also expanded sharply. During the third quarter of 1950, weekly hours averaged the highest for any comparable period since 1946. This rise in weaving activity soon resulted in a reduction of the pockets of unemployment which, since early 1949 had been present in major centers of wool weaving such as Lawrence, Mass. and Providence, R. I.

The bulk of the employment gain occurred in New England where the major part of the woolen and worsted manufacturing industry is located. In 1947, that region accounted for 60 percent of those employed in the industry with most of it concentrated in Massachusetts and Rhode Island. The Middle Atlantic States - New York, Pennsylvania, and New Jersey - accounted for another 20 percent of the industry's employment.

Despite the current upturn, however, employment in the woolen and worsted industry is still relatively low. October employment of 114,200 was 2 percent below the 1939 level. In sharp contrast, employment in all nondurable manufacturing industries increased 33 percent between 1939 and October 1950.

The failure of woolen and worsted employment to expand can be explained mainly by two factors: competition from rayon apparel, especially in summer suitings, and the continuation of the long-term decline in demand for heavy clothing. This latter factor, accompanying the development of better heated homes and cars, has been particularly depressing on the woolen segment of the industry. As a consequence of this lack of growth in the industry, few new woolen and worsted mills have been erected over the past 10 years. Those that have been, are, for the most part, located in the South.

A rise in the industry's level of activity is expected, however, in the immediate future, from military orders. Congressional action on the 18 billion dollar emergency defense budget requested by the President is expected to provide defense agencies with 900 million dollars for the purchase of clothing and equipage. Some idea of the possible magnitude of defense purchases may be gleaned from World War II figures. The U. S. Tariff Commission estimates that during the last war the minimum quantity of wool (clean basis) required for each combat soldier per year was about 100 pounds.

Trends in Production

Apparel fabric production during the first 9 months of 1950 totaled 280 million yards (table II). This was 13 percent above the total for the comparable period of 1949.

Table II

Production of Woolen and Worsted Woven Goods for Apparel 1/

(in thousands of finished linear yards)

Period	1946	1947	1948	1949	1950
Total	524,000	437,000	436,000	351.000	
1st quarter	126,000	125,000	116,000	85,000	91,000
2nd quarter	134,000	98.000	115,000	74,000	93,000
3rd quarter	127,000	99,000	105,000	90,000	97,000
4th quarter	137,000	114,000	100,000	102,000	

1/ Includes all woven goods containing by weight 25 or more percent of wool fiber. A small part of this production was manufactured by cotton and rayon weavers - in 1949 this amounted to 7 percent of the total.

Final production figures for wool fabrics in 1950 will probably total less than that for any other postwar year except 1949, despite the fact that the 1950 National income aggregate will turn out to be near or above record levels. Undoubtedly, the high price of wool relative to other fibers, as well as the other depressing factors already mentioned, have continued to be major factors in limiting the market for woolen and worsted apparel.

Increased consumption of wool by the entire industry to meet both civilian and greatly expanded defense needs in the future will be hindered by the world-wide raw-wool shortage. The limited supply of wool may be more effectively utilized by blending it with other fibers as was done during World War II. At present, there is only a minor volume of blending being done in woolen and worsted mills.

Despite the high prices offered for raw wool, supply is not easily expanded. The number of domestic stock sheep is at an extremely low level. Both land and farm labor have found more profitable alternative uses during the postwar period.

Trends in Weekly and Hourly Earnings

The record gross average hourly earnings figure of $1.44 received by production workers in October 1950 reflected the 12 cents an hour wage rate increase that was granted very widely in the woolen and worsted industry. This was the first general wage rate increase in the industry since early 1948. Weekly earnings of $56.46 in October 1950 were also at a record level (table III).

Table III

Hours and Earnings of Production Workers
in the Woolen and Worsted Industry
1947-1950

Period		Average Hours and Earnings		
		Weekly Earnings	Weekly Hours	Hourly Earnings
1947		$46.28	40.0	$1.157
1948		52.45	40.1	1.308
1949		51.19	38.9	1.316
1950	January	52.92	39.7	1.333
	February	52.51	39.6	1.326
	March	51.00	38.9	1.311
	April	50.94	38.8	1.313
	May	51.94	39.5	1.315
	June	53.36	40.3	1.324
	July	53.51	40.2	1.335
	August	54.60	40.9	1.335
	September	54.53	40.6	1.343
	October	56.46	39.1	1.444

The Southern segment of the woolen and worsted industry, as represented by Virginia and North Carolina, showed a lower level of wage rates compared with those in the rest of the industry, according to a survey made in May 1950 by the Division of Wage Statistics of the Bureau of Labor Statistics. This differential is also revealed in the State data provided in table IV.

Women Workers

Women workers comprise a substantial portion of the workforce in this industry, amounting to approximately 39 percent of the total in June 1950. This was a considerable decline from the 48 percent reported during the war year of 1944, but was close to the prewar figure of 41 percent recorded in 1939.

Table IV

Hours and Earnings of Production Workers in the Woolen and Worsted Industry, by State

September 1950

State	Average Hours and Earnings		
	Hourly Earnings	Weekly Hours	Weekly Earnings
U. S. total	$1.343	40.6	$54.53
Massachusetts	1.369	40.1	54.90
Rhode Island	1.385	39.7	54.98
New York	1.358	42.3	57.44
New Jersey	1.431	41.1	58.81
Pennsylvania	1.339	40.6	54.36
Ohio	1.290	43.2	55.73
North Carolina	1.140	44.5	50.73

ELECTRONICS

. . . Employment increases rapidly

Employment in the radio and related products industry* increased throughout 1950. However, the increase during the last 3 months of the year was greater than in the previous 9 months combined. Increased military orders for electronic equipment and greater production of radio and television sets largely accounted for this sharp employment increase. Increased weekly hours and earnings accompanied the rise.

Employment in Radio and Related Products Manufacturing
Compared with Production of Radio and Television Sets, 1950

Month	Production workers 1/ (in thousands)	Television set production 2/ (thousands of units)	Radio set production 2/ (thousands of units)
January	130.3	423	979
February	134.2	536	1,804
March	138.2	643 (5 weeks)	1,090
April	144.2	432	942
May	146.1	597	1,438
June	151.6	522 (5 weeks)	1,539
July	153.3	330	723
August	169.6	702	1,203
September	172.3	817 (5 weeks)	1,317
October	186.9	814	1,414
November	192.1	752	1,304
December	-	879 (5 weeks)	1,603

1/ Source: Bureau of Labor Statistics
2/ Source: Radio and Television Manufacturers Association

* The radio and related products industry manufactures radio and television receivers, commercial radio and television equipment, military radio and radar equipment, and other electronic equipment and parts. The radio and related products industry and the electronic tube industry together are often spoken of as the electronic industries.

Postwar Employment Trends

During reconversion following World War II, employment in the radio and related products industry dropped sharply from the 1944 peak when over 250,000 production workers had been engaged in fabricating military electronic equipment. After reconversion, employment again increased until 1947 when the industry produced a record output of 20 million radio receivers. Employment declined sharply in 1948 and 1949, although the value of radio and television receiver production advanced considerably. Television set production increased very rapidly during these 2 years and by 1949 had supplanted radio receivers as the industry's principal product.

Production Workers in Radio and Related Products Manufacturing, Compared with the Production of Radio and Television Sets, 1946-50, and 1944 Production of Military and Civil End Equipment, Manufacturers Value

Year	Production workers (in thousands) 1/	Value of Output (in millions) 2/
1944	252.0	$2,830
1946	n.a.	435
1947	142.4	700
1948	123.0	755
1949	112.7	890
1950	156.3 (11 months)	1,700

1/ Source: 1944: War Production Board; 1947-50: Bureau of Labor Statistics

2/ Source: 1944: War Production Board (military and civil end products and parts, except tubes); 1946-50: Radio and Television Manufacturers Association (radio and television receiver sales at manufacturers value)

The downward trend in employment ended in mid-1949 and then trended steadily upward. However, employment has not kept pace with production in radio and television set manufacturing, although the disparity was less pronounced in 1950 than in 1948 and 1949. In 1950, the industry produced over twice the 1947 value of output with only 10 percent more workers.

Employment in the postwar period has increased less rapidly than production largely because of the introduction of mass production techniques in television manufacturing and continued improvement in radio manufacturing techniques. A major cause of the recent employment rise in the radio and related products industry is the expanded production of military electronic equipment, in addition to the high radio and television output.

Production and Record Levels

Electronics production increased steadily during 1950 and at the end of the year was substantially above 1949. Television set production during 1950 was two and a half times 1949 production, and radio set production exceeded 1949 levels by 25 percent. An estimated 14.6 million radio sets and 7.4 million television sets were manufactured in 1950, and the 1950 value of manufacturers' sales was greater than in any peacetime year.

Radio and Television Set Production
Units and Manufacturers Value, 1946-50 1/

	Units (in thousands)		Value (in millions)		
Year	Radio sets	Television sets	Radio sets	Television sets	Total
1946	15,955	6	$434	$ 1	$ 435
1947	20,000	179	650	50	700
1948	16,500	975	525	230	755
1949	11,400	3,000	310	580	890
1950	14,560	7,400	400	1,300	1,700

1/ Source: Radio and Television Manufacturers Association

During the first 6 months of 1950, monthly television set production was fairly stable. However, following the normal drop in July during the industry's vacation period, production increased rapidly until November. The increase in October was particularly sharp and almost as many television sets were produced in the 4 weeks reported for that month as in the 5 weeks reported for September. Radio set production advanced even more sharply during October. Television and radio receiver production declined only moderately during November and December despite increasing shortages of materials and components. In spite of the combined effect of the television set excise tax, consumer credit restrictions, and the color television controversy, television receiver sales continue at record levels.

Production of other electronics products also increased in 1950 although the dollar volume is not available. Radio and television receivers still compose by far the largest part of electronics output. Military deliveries have increased rapidly but the full impact of military procurement will not be felt until late 1951. Commercial electronic equipment manufacturing has also expanded moderately. Since around three-quarters of the parts and electron tube output normally goes into finished equipment (of which radio and television sets make up by far the greater proportion) production of parts and electron tubes must have expanded with radio and television set production. The total value of output of all products combined may be over two-thirds of the industry's wartime production record of 3.5 billion dollars in 1944.

Location of Employment

Electronics production and employment is heavily concentrated in the New York, Philadelphia, and Chicago metropolitan areas. In 1947, 80 percent of the workers in the radio and related products industry were employed in six States.

Employment in the Radio and Related Products Industry, by State, 1947

State	Percent of total
Illinois	24
New York	19
New Jersey	12
Indiana	10
Pennsylvania	8
Massachusetts	7
Ohio	5
Michigan	3
Connecticut	3
California	2
All others	7
Total	100

Source: 1947 Census of Manufacturers

Employment in the electron tube industry was even more concentrated in the industrial Northeast. Since the census, production of electronic specialty equipment has increased in California and in certain other aircraft manufacturing areas. California, Massachusetts, and Illinois had greater employment increases in 1950 than other States. Pennsylvania had the smallest percentage increase. However, some of the States with the smaller increases were already producing at high levels.

A few large firms manufacture the majority of radio and television sets, electron tubes, and commercial and military equipment. Several hundred small firms produce the balance of these finished products and produce parts. There is no uniform manufacturing organization pattern, however; some firms make all types of products and others only assemble sets or fabricate parts.

Electronics Labor Force

The great majority of workers engaged in manufacturing radio and television sets, parts, and electron tubes are either semiskilled or unskilled since these products are usually mass-produced on an assembly line. A larger proportion of skilled workers are required in the production of the more complex military and commercial equipment because it is usually produced in small quantities and often on a custom basis. Nevertheless, the great majority of workers producing military equipment are also semiskilled or unskilled. Women compose the greater part of the labor force manufacturing electronic products. In September 1950, 58 percent of plant workers in radio, television, and related products manufacturing were women. Radio and television set and parts manufacturers employ a greater proportion of women than do commercial and military equipment manufacturers. In March 1950, two-thirds of the plant workers in electron tube manufacturing were women. This high proportion of women, who make up one of the chief reservoirs of labor, facilitate expansion during periods of general labor shortage.

Hours and Earnings Increasing

Earnings in electronics manufacturing have traditionally averaged lower than in manufacturing, owing to the large proportion of women and the low proportion of skilled workers.

Hours and Earnings in the Radios and Related Products

Year and Month	All manufacturing industries	Radios and related products		
	Average Weekly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Average 1947	$49.97	$44.41	39.2	$1.133
1948	54.14	48.53	39.2	1.238
1949	54.92	50.68	39.5	1.283
1950 1/	59.98	53.45	40.7	1.312
1950				
January	56.29	53.05	41.0	1.294
February	56.37	52.62	40.6	1.296
March	56.53	52.54	40.6	1.294
April	56.93	52.21	40.6	1.286
May	57.54	51.82	40.2	1.289
June	58.85	51.93	40.1	1.295
July	59.21	52.46	40.6	1.292
August	60.32	52.89	40.5	1.306
September	60.68	54.79	41.1	1.333
October	61.99	57.12	41.6	1.373
November	62.06	56.50	41.0	1.378

1/ First 11 months.

Between States in 1950, average weekly earnings varied more widely than hourly earnings, usually because of differences in the length of the workweek. The trend in hourly earnings was generally upward during 1950, with a sharp upturn in September. New Jersey, Indiana, and New York led in earnings and the lowest earnings were in Massachusetts. Owing to the television boom, the radio and related products industries workweek was above 40 hours throughout 1950 and above the all-manufacturing average until mid-year. A noticeable variation in the average workweek between States is examplified by New Jersey and Illinois, where the average workweek was substantially above 40 hours throughout 1950, and New York and California, where it averaged less than 40 hours during the first 9 months of 1950.

Until September, the rising output was achieved by increasing employment rather than lengthening the workweek. It is usually more economical to add to an unskilled labor force than to extend the workweek and pay overtime, and this was possible because a large part of the industry's production was in labor surplus areas. However, by September, one of the principal manufacturing centers (Chicago) was no longer a labor surplus area, and intensified production schedules led manufacturers in almost all areas to start increasing the workweek. This trend continued in October and may go further, as the defense program gains momentum and competition for labor increases.

Turn-over Increasing

Turn-over rates in the radio and related products industries increased sharply after June, following the trend in most durable-goods industries. Separation rates increased more rapidly than hiring rates but still remained substantially below accessions. Most separations were voluntary with discharges, lay-offs, and other separations remaining relatively constant.

Employment Will Continue to Increase

The existing high level of civil production is expected to continue in early 1951 until the industry exhausts its stocks of materials and components. Television set production will probably continue at the expense of radio set production during the conversion to defense production, owing to greater consumer demand for television sets and higher profits from their manufacture. Material shortages have hampered the radio and television industry from time to time and will be increased by cutbacks in essential materials ordered by the Government. The military electronics program will gain momentum early in 1951 and progressively replace civil electronics production in all segments of the industry. Defense production, although still relatively low, is rapidly increasing and is expected to be many times the existing level by the third quarter of 1951. It will be super-imposed on a reduced, but still appreciable, civil production. Current industry forecasts anticipate that television production will drop to half of late 1950 rates by mid-1951. An even greater reduction in radio set production is expected.

Electronics employment will increase for several months although there may be temporary declines while portions of the industry are retooling for military production. Military production requires more skilled metalworking operations than the civilian branch of this industry. The electronic industries will compete with rapidly expanding metalworking industries in some areas where there is an acute shortage of certain skilled workers. However, even with the expanded military program accompanying the President's declaration of emergency, it is unlikely that the electronics industries will experience serious difficulty obtaining an adequate supply of semiskilled and unskilled workers who make up the bulk of their labor force.

Labor - D. C.

FOOTWEAR

. . . . employment turns up in 1950.

Employment in the footwear (except rubber) industry in 1950 turned upward after declining steadily for the past 2 years. However, the gain over 1949 was relatively small, amounting to 3,000 workers or 1.4 percent. Because of a longer workweek in 1950, the increase in the number of man-hours worked totaled 4 percent. Production was expected to show an increase of 3.6 percent for the year. Despite these gains, both production and employment will still be considerably short of the postwar peaks reached in 1946 and 1947, respectively.

Employment in shoe manufacturing over the last 10 years has failed to keep pace with employment in manufacturing as a whole and with footwear production. The 229,000 factory workers in 1950 actually totaled 3,000 fewer than in 1939. Increasing productivity and a shift to new shoe types requiring less labor time than formerly are mainly responsible for the downward employment trend.

Postwar Decline in Production and Employment

Although footwear production reached its peak in 1946, it was not until a year later than footwear employment achieved its record level. Between 1946 and 1947 shoe output dropped by 11.5 percent and the number of factory workers increased by 7.5 percent to a total of 235,500. This divergence in trends was a postwar phenomonon. In 1946, owing to a tremendous accumulated demand for types of shoes that had not been available during the war, shoe production spurted. National output reached an all-time peak of 529,000,000 pairs, an average of 3.72 pairs per person. The percent of National income spent on shoes and other footwear was the highest since 1939. The year 1946 was the last in the wartime cycle during which the industry produced on capacity basis.

Large price increases in 1947 and the lessening urgency to buy shoes as deferred demands were met more than offset the further rise in total consumer spending. Both per capita and total shoe consumption slumped drastically. The decline was small in staple lines of dress and work shoes; it was very large in the specialty lines of sandals, playshoes, slippers, and athletic shoes.

Also in 1947, for the first time since the prewar period, seasonality of production and distribution re-appeared. Well-defined peaks were again observable in the pre-Easter and preschool periods. At the same time, competition forced the return of more types of shoe styling

which further cut manufacturing efficiency and increased unit man-hours. Therefore, additional workers were hired in 1947 and the average number of man-hours required per pair in the manufacture of shoes increased about 6 percent during the year. This productivity decline in 1 year cancelled more than half the man-hour gains achieved between 1939 and 1946.

Continuation of boom conditions in practically all other lines of economic activity and some revival in the demand for shoes in late 1947 and early 1948 prompted expanded output again. Employment responded directly to increased output. The average number of factory workers in the first half of 1948 was 3.4 percent higher than in the corresponding period of the previous year. In February 1948, production-worker employment of 250,800 was at an all-time high.

When consumption lagged behind production in the latter half of 1948, many producers and their retail outlets built up excessive inventories and consequently curtailed operations. In 1949, however, output climbed again to the impressive total of 473,000,000 pairs. The increase was accomplished with a considerably smaller work force. Employment for the year declined to 226,200, off 3.7 percent from the previous year.

Production, Employment, and Length of Workweek in the Footwear Industry, 1939-1950

Year	Production 1/ (thousands of pairs)	Average employment of factory workers	Average workweek (in hours)
1939	424,136	2/ 232.4	35.6
1947	468,069	235.5	38.3
1948	462,320	234.8	36.6
1949	473,005	226.3	35.9
1950	490,000 (E)	229.3	36.8

1/ Data provided by Bureau of the Census.

2/ Estimated on basis of Census of Manufactures data.

Current Trend

The shoe industry expanded its operations in the last half of 1950 with year-to-year comparisons for successive months showing ever-widening gaps. Production of footwear for the first 11 months of 1950 was 4 percent ahead of that in the corresponding period of 1949. Military orders were negligible in the sudden increase. Estimates by the Bureau of the Census for the entire year indicate that about 490,000,000 pairs of shoes were produced, about 17,000,000 more than in 1949.

Employment, however, has failed to keep pace with production. The number of factory workers in December totaled 228,600, a seasonal increase of 1.4 percent from November. For 1950 as a whole, only 1.3 percent more workers was employed than in 1949. The change in the number of workers by itself, however, is slightly misleading, since the average workweek in 1950, at 36.8, was about an hour longer than in the previous year. On a man-hour basis, the increase totaled 4.1 percent over 1949, closely approximating the production trend.

Production Worker Employment in the Footwear Industry
by Month, 1947-50
(in thousands)

Period	1947	1948	1949	1950
Average	235.5	234.8	226.2	229.3
January	232.9	249.2	232.5	231.4
February	235.3	250.8	234.5	234.5
March	236.1	247.4	234.4	234.5
April	232.7	229.4	227.8	221.5
May	224.4	219.1	215.7	217.5
June	226.7	229.8	222.5	224.3
July	229.6	232.9	226.3	229.8
August	237.2	238.7	234.2	237.1
September	239.5	235.3	230.2	236.7
October	241.0	233.4	224.3	230.3
November	243.2	223.9	208.0	225.5
December	247.9	227.5	223.7	228.6

Among the major shoe producing States, outstanding employment gains were recorded in New Hampshire and Missouri; October 1949 to October 1950 increases (latest data available) amounted to 5 percent each. In New Hampshire, the increase is attributed to the reopening of several plants which had previously closed down and possibly to the influx of a few Massachusetts establishments. The gain in Missouri was due in part to the transfer of some plants from Illinois and New England as well as general expansion in activity. Employment in Massachusetts, Maine, Pennsylvania, and New York remained virtually stationary over the year.

1951 Outlook is Favorable

As of the beginning of 1951, the industry was generally optimistic, with most responsible sources anticipating greater production than in 1950. The National Production Authority estimates that over 500 million pairs of shoes will be produced during the year, with the military buying 8 to 10 million at a minimum. Despite the fact that military shoes take more than three times as much upper leather as men's civilian shoes, it is anticipated that shoe making materials, including leather, will be sufficient to meet requirements.

The National Shoe Manufacturers Association reports the possibility of an even sharper increase in output in 1951, if the international situation becomes more critical. Manufacturers might be expected to push production in anticipation of material shortages and an increasing consumer demand. In 1941, just prior to our entry into the war, shoe production increased by 94 million pairs, or 23 percent, over the year previous. Most of that increase reflected civilian demand since only 15 million of the additional pairs produced were purchased by the military.

Long-Term Trend of Employment is Down

The footwear industry is one of the few major groups in the American economy which has failed to keep pace with employment in manufacturing as a whole. In fact, 1950 employment of approximately 229,000 was actually 3,000 lower than in 1939. Output over the same period increased 14 percent.

Several factors account for the long-term relative decline. Technological change has contributed somewhat to increased output with fewer man-hours. Installation of conveyor belts, elimination of hand cutting in some instances, a new technique of "sliplasting," and other improvements have resulted in a productivity increase of 3.5 percent between 1939 and 1948. In addition, new shoe types introduced during the war have continued to be popular. These shoes, including casuals and playshoes, are made with materials such as fabric, plastics, rubber, and cork as a substitute in whole or in part for leather, and require fewer man-hours per shoe than the conventional types.

Regional Distribution of Footwear Industry

In July 1948, more than 1,100 companies were manufacturing shoes in the United States. Regionally, New England produced about 32 percent of the shoes in 1949, the Middle Atlantic States 28 percent. Major concentrations by States (in 1949), in order of descending importance, were found in New York, Massachusetts, Missouri, Pennsylvania and New Hampshire.

Percentage of Shoe Production by States

Year	U. S.	Mass.	Maine	N. H.	N. Y.	Penn.	Ohio	Illinois	Missouri	Wisc.	Other
1949	100.0	17.5	5.8	8.2	17.9	9.9	3.8	6.1	11.9	3.7	15.3
1946	100.0	20.7	6.1	8.2	19.0	8.2	3.3	6.6	11.4	3.5	13.0
1939	100.0	19.5	6.8	9.0	16.6	7.7	4.1	7.5	11.5	3.9	13.4
1929	100.0	23.4	4.3	6.9	21.7	4.8	3.3	7.5	13.3	4.8	10.0
1919	100.0	35.3	5.8	6.9	19.0	7.1	5.4	3.2	8.0	3.4	5.9
1899	100.0	47.1	4.9	9.7	8.9	5.7	6.4	2.8	3.8	1.6	9.1

Source: Bureau of Census, Department of Commerce.

New England's share of the market shows a long-term decline. In fact, since 1946, with the exception of Pennsylvania, all the old established shoe areas have lost ground; only Pennsylvania and a group of "other" States have shown marked increases in importance.

The shift in markets combined with the low capital requirements for entering the shoe industry, wage levels, and the increased mechanization of the production process have accounted for past shifts.

Hours and Earnings

Shoe workers are paid on a piece-rate basis with incentive plans in effect in most plants. Average hourly earnings are generally highest in large urban areas, in small plants, in factories producing men's and women's shoes, and where union organization is strong.

Hours of work and average weekly earnings showed their usual seasonal increase in December 1950 as the workweek increased to 37.4 hours. Evidence of the increasing tempo of activity is afforded by a month-to-month comparison with last year. January and February 1950 each showed a workweek which was one-half hour longer than January and February 1949. By mid-year, the spread was 1 hour and in only one month since then has it been less than 1-1/2 hours.

Average hourly earnings of $1.17 in December were fractionally higher than in November. This was the fifth successive month in which a new record was established.

Labor costs in shoe production average more than 25 percent of total manufacturing costs and are second in importance only to material costs. Regional differences in the wage rates of shoe workers, therefore, are of great importance to the highly competitive shoe industry. In the past, migration of firms within areas and between areas has been motivated to a great extent by the desire of manufacturers to utilize less expensive labor.

Average Hourly Earnings in the Footwear Industry for Selected States
November 1950

State	Average hourly earnings	State	Average hourly earnings
California	$ 1.47	New Hampshire	$ 1.24
Indiana	1.03	New York	1.27
Maine	1.12	Ohio	1.15
Maryland	.97	Pennsylvania	1.02
Massachusetts	1.26	Wisconsin	1.24
Missouri	1.13		

U.S. DEPARTMENT OF LABOR
Bureau of Labor Statistics

Table 1. STRAIGHT-TIME AVERAGE HOURLY EARNINGS 1/ IN SELECTED OCCUPATIONS IN FOOTWEAR MANUFACTURING, BY PROCESS AND WAGE AREA, SEPTEMBER 1950

Occupation and sex	Women's Cement Process Shoes - Conventional Lasted									
	New England									
	Auburn-Lewiston, Maine	Boston, Mass.	Haverhill, Mass.	Lynn, Mass.	Southeastern New Hampshire	Worcester, Mass.	New York, N. Y.	Missouri, (except St. Louis)	St. Louis, Mo.	Los Angeles, Calif.
Plant occupations, men										
Assemblers for pullover, machine	$1.72	$1.67	$1.71	$1.82	$1.55	$1.69	$2.03	$1.27	$1.61	$1.85
Bed-machine operators	1.62	1.54	1.88	1.64	1.67	1.66	2.12	1.40	1.62	1.73
Cutters, vamp and whole shoe, hand	(2/)	(2/)	(2/)	(2/)	(2/)	(2/)	2.30	1.33	1.69	(2/)
Cutters, vamp and whole shoe, machine	1.59	1.67	1.67	1.62	1.50	1.64	1.51	1.33	1.57	1.88
Edge trimmers, machine	1.91	1.91	1.78	1.63	1.75	1.75	2.55	1.44	1.85	1.68
Fancy stitchers	(2/)	1.70	(2/)	(2/)	(2/)	(2/)	2.22	(2/)	(2/)	1.48
Floor boys	.77	.87	.83	.86	.89	.83	.94	.85	1.00	.99
Mechanics, maintenance	1.71	2.00	1.72	1.84	1.60	1.67	(2/)	1.41	1.54	1.71
Side lasters, machine	1.80	1.74	1.90	1.57	1.63	1.63	2.15	1.45	1.66	1.83
Sole attachers, cement process	1.48	1.53	1.64	1.79	1.52	1.48	2.23	1.15	1.48	1.65
Top stitchers	(2/)	1.84	(2/)	(2/)	(2/)	(2/)	2.04	(2/)	(2/)	(2/)
Treers	1.43	1.59	1.65	1.52	1.45	1.35	1.93	1.31	1.65	(2/)
Vampers	(2/)	(2/)	(2/)	(2/)	(2/)	(2/)	2.12	(2/)	(2/)	(2/)
Wood-heel-seat fitters, hand	(2/)	(2/)	(2/)	1.79	(2/)	(2/)	1.98	1.17	1.65	(2/)
Wood-heel-seat fitters, machine	1.59	1.63	1.48	1.69	1.38	1.59	1.91	1.04	1.74	(2/)
Plant occupations, women										
Fancy stitchers	1.16	1.37	1.25	1.13	1.13	1.14	1.66	.94	1.20	1.48
Floor girls	.91	.98	.95	.96	.91	.94	1.04	.93	.95	1.02
Top stitchers	1.29	1.60	1.31	1.25	1.16	1.23	(2/)	1.05	1.27	1.53
Treers	(2/)	(2/)	(2/)	(2/)	(2/)	(2/)	(2/)	.97	1.37	(2/)
Vampers	1.45	1.77	1.24	1.24	1.08	1.16	(2/)	1.00	1.32	1.52
Office occupations, women										
Clerks, payroll	.78	.93	.87	.89	.83	.81	1.16	.92	.87	1.08
Clerk-typists	(2/)	.90	(2/)	.83	.84	(2/)	1.02	.79	.87	(2/)
Stenographers, general	.87	.95	.91	.87	.86	(2/)	1.27	.92	1.04	(2/)

Occupation and sex	Women's Cement Process Shoes - Slip Lasted			Men's Goodyear Welt Shoes				Children's Goodyear Welt Shoes	Children's Stitchdown Shoes
	Missouri, (except St. Louis)	St. Louis, Mo.	Los Angeles, Calif.	Brockton, Mass.	Worcester, Mass.	Illinois	Southeastern Pennsylvania		New York, N. Y.
Plant occupations, men									
Assemblers for pullover, machine	-	-	-	$1.69	$1.47	$1.71	$1.09		-
Bed-machine operators	-	-	-	1.51	1.47	1.79	1.35		-
Cutters, vamp and whole shoe, hand	(2/)	$1.58	$1.92	1.47	(2/)	1.87	1.10		(2/)
Cutters, vamp and whole shoe, machine	$1.13	1.43	1.92	1.66	1.57	1.62	1.22		$1.83
Edge trimmers, machine	1.36	1.64	2.18	1.89	1.76	1.85	1.35		1.92
Fancy stitchers	(2/)	(2/)	1.66	(2/)	(2/)	(2/)	(2/)		2.01
Floor boys	.94	(2/)	(2/)	(2/)	(2/)	.87	.78		.84
Goodyear stitchers	-	-	-	1.65	1.56	1.68	1.17		1.89
Mechanics, maintenance	1.33	1.35	1.65	1.68	1.59	1.49	1.33		(2/)
Platform-cover lasters	1.01	1.54	1.80	-	-	-	-		-
Side lasters, machine	-	-	-	1.57	1.53	1.61	1.21		-
Sock-lining stitchers	(2/)	(2/)	1.85	-	-	-	-		-
Sole attachers, cement process	1.32	1.42	1.64	-	-	-	-		-
Thread lasters	-	-	-	-	-	-	-		2.17
Top stitchers	(2/)	(2/)	1.52	(2/)	(2/)	(2/)	(2/)		1.84
Treers	(2/)	1.21	(2/)	1.43	1.44	(2/)	(2/)		(2/)
Vampers	(2/)	(2/)	(2/)	1.42	1.24	(2/)	(2/)		1.83
Plant occupations, women									
Fancy stitchers	.87	.91	1.54	1.12	1.13	1.13	.98		1.45
Floor girls	1.00	.95	(2/)	.90	.89	.96	.87		.98
Platform-cover stitchers	1.07	1.15	1.94	-	-	-	-		-
Sock-lining stitchers	1.07	.97	1.75	-	-	-	-		-
Top stitchers	.94	.98	1.61	1.11	1.09	1.24	1.02		1.42
Treers	1.09	1.17	1.26	(2/)	(2/)	1.18	.85		1.09
Vampers	.80	.98	(2/)	1.42	1.19	1.31	1.01		1.49
Office occupations, women									
Clerks, payroll	.88	1.17	(2/)	.88	.86	(2/)	.98		1.29
Clerk-typists	.78	.84	(2/)	(2/)	(2/)	.95	.93		(2/)
Stenographers, general	.92	(2/)	(2/)	.86	.90	(2/)	.96		(2/)

1/ Excludes premium pay for overtime and night work.
2/ Insufficient data to permit presentation of an average.

A survey covering selected occupations in the footwear industry in 13 major areas for September 1950 was recently completed by the Department of Labor (table 1). It showed that New York workers making women's cement process shoes (conventional lasted) generally had the highest average hourly earnings (exclusive of premium pay for overtime and night work) among the branches of the footwear industry.

Average earnings of men in New York exceeded $2 an hour in almost two-thirds of the selected occupations and were below $1.90 in only two occupations. The lowest earnings were most common in the children's Goodyear welt branch of the industry in Southeastern Pennsylvania and the women's cement process (slip lasted) branch in Missouri (except in St. Louis).

Edge trimmers were the highest paid among the selected occupations, average earnings ranging from $1.35 an hour in plants making children's Goodyear welt shoes in Southeastern Pennsylvania to $2.55 in women's cement process shoe plants in New York. In two-thirds of the areas, workers in this occupation averaged $1.75 or more an hour. Floor boys were the lowest paid among the men's occupations and averaged below $1 an hour in all except one area.

Among the women's occupations, top stitchers and vampers most commonly had the highest average hourly earnings; area levels ranged from 94 cents to $1.61 and 80 cents to $1.77, respectively. Floor girls usually had the lowest average earnings.

In the women's cement process (conventional lasted) branch of the industry in New England, Boston and Haverhill occupational average earnings ranked somewhat higher than those in the other four areas. Among the three areas shown for men's Goodyear welt shoes, the earnings levels in Illinois and in Brockton typically were higher than those in Worcester.

Trends in Output, Per Man-hour 1/

The average number of men-hours required per pair in the manufacture of shoes was reduced almost 10 percent from 1939 to 1946 but increased about 6 percent in 1947 (table 2). Man-hours required per pair were reduced in all but 1 year from 1939 to 1946; in 1942 wartime problems caused a slight rise in unit labor requirements. Heavy production and extensive curtailment of shoe styling favored manufacturing efficiency and aided in the reduction of unit man-hours, despite scarcity of labor and frequent material shortages. Lower production and increased styling resulted in increased man-hours per pair of shoes in 1947.

1/ For a fuller discussion, see Trends in Man-hours Expended per Pair in the Footwear Industry, 1939-1947 and 1947-1948, United States Department of Labor, Bureau of Labor Statistics.

TABLE 2 - INDEXES OF TOTAL (DIRECT AND INDIRECT) MAN-HOURS EXPENDED FOR THE MANUFACTURE OF SHOES

By Class and Factory Price Line 1/

(1939 = 100)

Classification of shoes	1940	1941	1942	1943	1944	1945	1946	1947	1948
ALL SHOES REPORTED	98.5	95.1	96.0	94.2	92.2	91.2	90.4	95.9	96.6
Men's shoes	101.8	98.4	98.6	96.3	97.5	98.8	98.5	101.7	101.2
Dress shoes	101.9	97.7	96.8	93.8	95.0	96.8	97.2	100.7	100.8
Low-priced	101.3	100.6	100.4	94.7	93.4	96.8	94.0	100.8	99.9
Low medium-priced	98.4	95.8	96.1	95.4	100.3	97.2	101.1	97.8	99.5
Medium-priced	100.6	98.4	96.4	95.6	98.8	101.8	101.1	104.1	108.1
High-priced	106.5	95.5	93.8	91.0	91.1	92.9	94.7	97.9	95.0
Work shoes	101.5	101.8	107.4	108.6	110.0	108.6	104.9	106.5	102.9
Women's shoes	94.2	90.5	91.5	88.5	86.1	84.7	83.9	90.8	92.5
Low-priced	94.4	92.2	97.1	96.3	89.3	85.3	91.1	103.8	102.3
Low medium-priced	92.5	87.8	86.6	84.2	82.9	81.4	77.2	82.2	87.8
Medium-priced	92.8	88.1	88.7	82.4	84.0	83.5	76.6	80.9	85.8
High medium-priced	99.6	93.8	93.5	89.7	87.6	88.6	89.9	92.8	97.0
High-priced	93.6	92.7	91.9	87.7	88.3	89.4	88.2	95.2	78.4
Youths' and boys' shoes	103.8	92.2	94.8	96.6	98.8	97.0	92.3	104.9	103.8
Misses' and children's shoes	100.7	100.8	102.1	104.5	98.0	94.3	94.5	95.4	94.3
Low-priced	103.5	101.8	102.8	104.7	95.8	92.3	93.9	95.5	94.8
High-priced	95.9	99.0	100.9	104.3	101.8	97.8	95.5	95.3	93.5
Infants' shoes	92.8	99.5	95.8	103.0	99.0	99.7	95.8	96.5	98.1
House slippers	2/	2/	118.3	116.4	101.7	91.9	92.2	105.1	106.6

1/ For 1939-1947, average factory price in 1945 was used to classify establishments by price groups. For 1948, factory prices in 1948 used.
2/ Not shown to avoid disclosure of individual companies.

The reduction in man-hours was accomplished largely in direct labor categories which constitute over 90 percent of the man-hours expended in shoe production. In contrast, the indirect or overhead labor expended per unit of output increased by almost a third from 1939 through 1947--a characteristic trend in many manufacturing industries during World War II. Overhead labor in the shoe factories was not reduced in 1947 when production dropped, and the result was a 10 percent increase in the indirect man-hours per pair from 1946.

Reductions in man-hours per pair were largest in establishments producing women's shoes, i.e., 16 percent from 1939 to 1946. Unit man-hours in women's shoe production, however, increased more than 7 percent from 1946 to 1947 due to increased styling and lowered production volume. In the manufacture of men's dress shoes, practically the same number of man-hours were required in 1947 as in 1939. The reductions in man-hours per pair between 1939 and 1943 were lost by 1947. In contrast with most other types of shoes, man-hour requirements increased per pair of men's work shoes during the war. This product benefited little from the simplified wartime styling. Small reductions were made in man-hours required to produce most types of juveniles' shoes during the period.

Man-hours required to manufacture a pair of shoes increased about 1 percent from 1947 to 1948, thus checking the sharp rise from 1946 to 1947. The adverse effect of a slight drop in total production, accompanied by an increase in complexity, style range, and quality demands, was nearly offset by a 10 percent increase in the amount of footwear constructed with rubber or composition soles. Some manufacturers reported that the latter types required fewer man-hours per pair than did leather soled footwear. In 1948 there was virtually no shortage of either materials or labor.

Man-hours per pair in the direct labor categories were virtually the same in 1948 as in 1947. But indirect labor rose almost 4 percent from 1947 to 1948, reaching a new high nearly 40 percent above 1939. This additional rise in overhead man-hours was caused by under-utilization of capacity, irregular scheduling of work in factories having smaller orders, and the return to seasonal operation patterns.

Women Hold Many Jobs

One of every two jobs in the footwear industry today is held by a woman. World War II provided the impetus for a substantially increased proportion of women in the industry although their wartime gains were not maintained in the postwar period.

In October 1939, women held 45 percent of the jobs in the shoe industry. Due to the shortage of male workers and the pressure to try women in jobs ordinarily considered suitable only for men, the proportion of women increased to 57 percent by the first half of 1945. Since then, their proportion has declined slowly, but steadily. In September 1950, the latest period for which data are available, women held 52 percent of the industry's jobs.

PETROLEUM REFINING

. . . employment expected to rise.

The petroleum refining industry was operating at record levels at the beginning of 1951, turning unprecedented quantities of crude petroleum into useable end-products such as gasoline, kerosene, fuel oil, and other basic products. The Nation's 370 refineries employed more than 200,000 wage and salary workers, and further increases in employment are expected. This industry is of particular current significance due to its vital importance in the mobilization effort. In addition to a growing demand from the armed forces, the industry must be able to supply a greatly stepped-up industrial machine and unusually heavy domestic transportation requirements. During 1950, refinery output and domestic consumption of petroleum products broke all previous records by a wide margin. Yet, stocks of refined products were growing in anticipation of still greater civilian and defense needs, and plans were being made to expand the industry's capacity further.

Recent Employment and Production Trends

Employment in refining rose steadily between 1939 and 1949 with the exception of minor fluctuations during World War II. In the last quarter of 1949, the trend was briefly interrupted by a moderate downward movement which reached a low of 186,000 in April 1950. By January 1951, employment was back to 202,000, not far below the all-time peak of 205,000 reached in August 1948, and double the 1939 level (see Table 1).

Both refinery production and capacity have increased steadily over the past decade. During 1950, crude runs to stills (the amount of crude petroleum that entered refineries for processing) and refinery capacity reached record levels. Between 1939 and 1950, crude runs increased about 70 percent; and from the end of World War II through 1950, they rose nearly 25 percent.

As of January 1, 1951, operating capacity of the Nation's refineries was estimated at about 6,500,000 barrels of crude oil daily and the industry had another 340,000 barrels daily capacity which was shut down, according to reports of the U. S. Bureau of Mines. Much of this shut-down capacity was in small or older and less efficient plants. In addition, an estimated 145,000 barrels daily of new capacity was under construction (see Table 2).

Factors Influencing Recent Trends

Many factors have contributed to the rapid growth of the petroleum industry. Although population growth has contributed to rising demand, it has been less important than the intensified use of petroleum in our

Table 1

EMPLOYMENT IN PETROLEUM REFINING INDUSTRY, 1939-1950
(in thousands)

Period		All Employees	Production Workers
1939		103.7	73.2
1940		111.0	79.1
1941		121.1	88.4
1942		129.6	99.2
1943		132.6	105.2
1944		145.5	110.0
1945		159.6	126.4
1946		173.5	134.8
1947		189.3	141.5
1948		199.1	148.9
1949		198.7	148.8
1950	January	195.4	145.4
	February	195.1	144.0
	March	194.8	142.8
	April	185.7	135.6
	May	186.2	136.1
	June	187.8	137.8
	July	189.0	138.5
	August	200.5	147.4
	September	198.1	144.6
	October	199.3	146.5
	November	201.5	147.7
	December	201.6	147.5
1951	January	201.8	147.3

Table 2

REFINERY CAPACITY AND PRODUCTION
(thousands of barrels daily)

Year	Capacity, operating, January 1	Crude runs to stills (average for year)
1939	3,933,785	3,391,000
1940	4,196,694	3,536,000
1941	4,180,588	3,861,000
1942	4,496,843	3,655,000
1943	4,409,013	3,917,000
1944	4,709,382	4,551,000
1945	5,077,690	4,711,000
1946	5,086,165	4,740,000
1947	5,336,399	5,075,000
1948	5,825,566	5,549,000
1949	6,230,505	5,327,000
1950	6,222,998	5,739,000
1951	6,500,000p	6,148,000*

p Preliminary
* Estimated by the Bureau of Mines
Source: Bureau of Mines, U. S. Department of the Interior.

economy. Probably the most important single element has been the rapid increase in the number of motor vehicles. Another factor of great importance has been the increased demand for heating fuels for use in homes and buildings and for industrial heating and power generation. The demand for aviation gasoline has also risen rapidly over the past ten years. In addition, there has been a steady rise in the number of tractors in use on farms, in the amount of asphalt needed for road construction, and in the number of Diesel locomotives.

During World War II, demand reached unprecedented heights; vast quantities of petroleum products were required by the Armed Forces and by war industries. Following the war, a further sharp increase in demand occurred. During 1947 and 1948, domestic consumption exceeded all previous records and many in the industry expected demand to rise even further in 1949. The industry had been caught with insufficient stocks towards the end of 1947, creating temporary shortages in some petroleum products. As a result, production in 1948 was permitted to out-strip demand, thus rapidly building up stocks of refined products. New refinery production records were established. By December the industry's operating ratio had climbed to 97.7 percent of total installed capacity.

In 1949, however, demand fell off, chiefly because of an 11 percent decline in exports of refined products. A trend has developed towards heavier imports and lower exports. In 1939, exports accounted for 13 percent of total output; in 1949 for only 5 percent. While domestic demand actually increased in 1949, the increase was much less than had been generally expected. As the year passed, stocks continued to rise while production and operating ratios were lowered. Production generally exceeded demand until the last few months in the year. Even then, an unusually mild winter caused a lower demand for heating fuels than had been expected.

The lower level of refinery activity in the latter part of 1949 and in the first half of 1950 reflected efforts to reduce refinery stocks, and expectations that demand would tend to level off somewhat. However, a considerable part of the fall in refinery employment in the summer of 1950 is attributable to a strike in one of the larger refineries.

In mid-1950, this downward trend was reversed and employment, production, and stocks of refined products began to climb. Operating ratios were increased. Demand turned up sharply once more. The advent of the Korean War, the quickened pace of mobilization, and heavier defense orders made it necessary to revise estimates of future requirements. It was felt safer to maintain larger stocks of refined and crude oils. During 1950, total demand rose 11 percent over 1949.

Prospective Demand for Petroleum Products

The Bureau of Mines forecasts a demand in 1951 of 2,614 million barrels, including exports.1/ The estimate for the first half of 1951 of 1,275 million barrels, 7 percent greater than the comparable period of 1950, is believed to approximate actual requirements, according to the Bureau of Mines. In the light of current developments, the estimate for the second half of 1951 may be understated. All indications point to much higher demand over the next few years. Both the needs of our military forces and of defense production are expected to expand. Meanwhile, domestic requirements are growing, particularly for heating fuels and gasoline.

New Capacity Being Added

During the past four years, the refining industry has been undergoing a period of rapid expansion, particularly in 1948 and 1949 when new construction records were set. This expansion of capacity has occurred through the construction of new plants, additions to existing plants, and the modernization of existing facilities. Construction and improvements will continue to be substantial in 1951 and 1952. While much of the increase in capacity will be achieved by additions and improvements, a substantial program for new plant construction seems essential to meet the expected growth in demand during the next few years.

Much of the present building program consists of new cracking units for producing regular and higher octane gasoline. Other construction is calculated to serve the synthetic rubber industry and to increase returns of kerosene and fuel oil. New facilities are being built in Texas at Port Arthur, Taylor, Baytown, Houston, Tyler, and Abilene. Sizeable refinery construction is also taking place in Cleveland, Ohio, and Perth Amboy, New Jersey. Superior, Wisconsin, and Portland, Oregon, are getting new refineries. Other points of refinery construction include Lake Charles, and Chalmette, Louisiana; Neodesha and Wichita, Kansas; Ponca City and Cleveland, Oklahoma; and Wood River, Illinois.

Relation of Capacity to Employment

Refinery employment is more closely related to changes in operating capacity than to fluctuations in output, since individual refinery units may be operated at widely varying rates without greatly affecting the number of workers needed. Processing jobs involve mainly tending equipment, which requires a relatively fixed number of workers; while maintenance jobs, which form the largest segment of employment, also tend to be stable in

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1/ Monthly Petroleum Forecast No. 185, United States Department of the Interior, Bureau of Mines.

comparison to the rate of production since such work must continue as long as the refinery is in operation. Employment in administrative, technical, and clerical jobs varies even less. Hence, growth of refinery employment will depend largely upon additions to capacity through new construction. Although long-run production and employment trends move together, in the short-run there is less correlation between the two.

Employment Outlook

The rising demand for petroleum products and increasing capacity indicate that new employment records will be set in the industry in 1951 and 1952. In addition to increasing employment, there will be many job openings resulting from the need to replace workers who die, retire, and transfer to other industries. Labor turnover rates in refining are among the lowest in industry. Both accessions and separations were less than a fourth as high in 1950 as the average for all manufacturing industries.

Most new plant workers will start as laborers, since the usual practice in refineries is to fill the more skilled jobs by promoting from within. There will also be opportunities in technical jobs, especially for chemists, chemical engineers, mechanical engineers, and laboratory technicians. Refinery stillmen, who have the responsibility of running the various distillation and cracking units, treaters, who operate purification units, and engineers have been placed on the Department of Labor's List of Critical Occupations.

Refineries are located with reference to two factors: proximity to markets and nearness to the supply of crude petroleum (near oil fields, at the terminals of oil pipelines, at deep water ports where tankers can dock). New jobs will open up at the new refineries being built at locations listed above. The bulk of present refinery employment is concentrated in the Gulf Coast of Texas and Louisiana, California, the inland areas of Texas and Oklahoma, the Philadelphia area, the New Jersey Coast around Bayonne, the Chicago area, and Kansas.

Earnings and Working Conditions

Earnings in petroleum refining are among the highest in industry. In December 1950, production workers in petroleum refining earned, on the average, $82.05 for a workweek of 40.7 hours. In the same month, the average for all manufacturing industries was $63.80 for 41.4 hours of work. Working conditions in refineries compare favorably with those in manufacturing industry generally. Most refinery jobs do not require great physical effort. Some workers, however, climb stairs and ladders to considerable heights in the course of their duties. Others work in hot places or are exposed to unpleasant odors. Refineries are relatively safe places in which to work; accident frequency is barely half the average for manufacturing as a whole. Because refineries operate 24 hours a day, 7 days a week, many of the process workers are on night shifts and many work on week ends. Plant jobs in refineries are filled almost exclusively by men; there are jobs for women in the laboratories and offices. There is little seasonal variation in refinery employment; nearly all the workers have year-round jobs (see table 3).

Table 3

EARNINGS AND HOURS OF PRODUCTION WORKERS

Period	All manufacturing industries	Petroleum refining		
	Average weekly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings
Average 1947	$49.97	$62.95	40.2	$1.566
1948	54.14	72.06	40.3	1.788
1949	54.92	75.33	40.2	1.874
1950				
January	56.29	77.41	40.7	1.902
February	56.37	78.84	39.6	1.890
March	56.53	74.88	39.6	1.891
April	56.93	77.11	40.5	1.904
May	57.54	75.73	39.9	1.898
June	58.85	76.82	40.2	1.911
July	59.21	78.93	41.0	1.925
August	60.32	75.29	39.4	1.911
September	60.68	80.45	41.6	1.934
October	61.99	80.93	41.1	1.969
November	62.38	81.80	40.8	2,005
December	63.80	82.05	40.7	2.016

MACHINE TOOLS

. . . . a key industry expands.

Employment in the machine tool industry has been rising rapidly and steadily since the outbreak of the Korean hostilities. The Nation's 300 machine tool plants employed more than 70,000 wage and salary workers in February 1951, nearly 50 percent more than in May 1950. Thousands of additional workers will be needed to meet production goals during 1951 and 1952.

This industry is vitally important today because of its function in the mobilization effort. Before other industries can expand to meet military requirements, the machine tool industry must furnish the tools of production. This industry is composed of plants primarily engaged in manufacturing power-driven tools that shape metal by grinding or progressively cutting away chips. The most common kinds of machine tools include engine lathes, turret lathes, grinding machines, boring machines, drilling machines, milling machines, planers and shapers.

World War II and Postwar Experience

The machine tool industry expanded sharply prior to and during the early part of World War II. From January 1939 to January 1943, employment grew from 31,000 to a peak of 123,000 production workers (table 1). The high point of employment in this industry was reached substantially before the Nation's industrial machine had swung into full wartime production. After reaching the peak in early 1943, employment dropped steadily reaching a low of about 52,000 production workers at the end of 1945. Employment would have been considerably lower during the last two years of the war if machine tool plants had not turned to making products other than machine tools. Many of the industry's plants utilized their facilities and trained manpower to produce direct war material, such as parts for aircraft and ships.

Table 2 shows the sharp increase in shipments of machine tools that occurred during World War II and also indicates the extent of the postwar decline in production. The combined output of machine tools in 1942 and 1943 was greater than the total production of the 20 years preceding World War II. Moreover, many of the machine tools produced during the war were adaptable to peacetime production. Large quantities of machine tools owned by the Government were sold as surplus property, following the end of the conflict. Contrary to many predictions, however, this accumulation did not create an immediate postwar slump in the machine tool industry. In the early postwar period, production worker employment increased moderately,

reaching a high point of 62,000 in the fall of 1946. This rise reflected the large amount of machine tools needed in the reconversion of American industry to peacetime production. As the Nation completed its reconversion and retooling, orders for machine tools declined substantially. During 1947, 1948, and 1949 there was a continuous decrease in employment in the machine tool industry, the number of production workers falling to less than 36,000 in December 1949, the lowest mark since August 1939.

Table 1

PRODUCTION WORKER EMPLOYMENT - MACHINE TOOL INDUSTRY, 1939-1951
(in thousands)

Period	Number		Period	Number
1939	36.6	1950	January	36.0
1940	56.8		February	36.4
1941	81.8		March	36.6
1942	112.2		April	37.0
1943	109.7		May	37.7
1944	79.0		June	38.7
1945	66.7		July	38.7
1946	59.7		August	41.6
1947	54.9		September	44.4
1948	48.9		October	47.0
1949	39.6		November	48.9
			December	51.0
		1951	January	53.2
			February	55.7

Table 2

SHIPMENTS OF MACHINE TOOLS
1939-1950

(thousands of dollars)

Period	Amount	Period	Amount
1939	166,644	1946	331,164
1942	1,321,752	1947	322,356
1943	1,180,212	1948	277,524
1944	497,448	1949	241,368
1945	457,512	1950	295,000 1/

1/ Estimated.

Source: U. S. Bureau of Census

Recent Trends and Employment Outlook

A pickup in general business conditions in early 1950 and an increase in foreign orders for machine tools, resulted in a reversal of the postwar downward trend in the first 5 months of 1950. The rapid expansion of the machine tool industry since the beginning of Korean hostilities is similar to that which occurred prior to United States entry in World War II. Following the outbreak of war in Europe, employment increased from 34,000 in August 1939 to 53,000 in April 1940. From 39,000 production workers in June 1950 employment has grown to more than 55,000 in February 1951. Employment has increased between 2,000 and 3,000 production workers each month since July 1950. Employment is expected to increase steadily in 1951 and 1952. However, indications are that the peak levels of World War II will not be reached during 1952.

Table 3

EARNINGS AND HOURS OF PRODUCTION WORKERS

Period	All manufacturing industries	Machine tool industry		
	Average weekly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings
Average 1947	$49.97	$57.75	42.4	$1.362
1948	54.14	61.57	42.2	1.459
1949	54.92	59.15	39.3	1.505
1950				
January	56.29	59.66	39.2	1.522
February	56.37	61.86	40.3	1.535
March	56.53	63.00	40.8	1.544
April	56.93	64.69	41.6	1.555
May	57.54	65.46	41.8	1.566
June	58.85	66.58	42.3	1.574
July	59.21	66.88	42.3	1.581
August	60.32	71.16	44.2	1.610
September	60.68	72.24	44.1	1.638
October	61.99	76.78	45.7	1.680
November	62.23	77.51	45.7	1.696
December	63.88	80.86	46.9	1.724
1951				
January	63.71	81.26	47.0	1.729
February	63.76	82.30	47.3	1.740

Work Week Lengthens

A lengthened workweek has accompanied expanded employment in the machine tool industry. From an average of 41.8 hours in May 1950 the average workweek has been lengthened to 47.3 hours in February 1951, the highest average of any manufacturing industry (table 3). The average workweek in the machine tool industry increased from 38.1 hours in January 1939 to a high of 55 hours in January 1942, but declined somewhat thereafter. A survey of the industry in December 1950 showed that nearly 60 percent of all production workers were employed in plants with scheduled workweeks of 48 hours or longer.

Earnings in the machine tool industry compare favorably with other manufacturing industries. In February 1951 production workers earned on the average of $82.30 for a workweek of 47.3 hours. In the same month the average for all manufacturing industries was $63.76 for a 40.9 hour workweek. Average hourly earnings of production workers of $1.74 in February 1951 represented an all-time high for the industry. The average for all manufacturing was $1.56.

Location of the Industry

The manufacturing of machine tools is primarily concentrated in two areas. In 1950 the Great Lakes region employed over half of the workers found in the industry and another third were employed in New England. Among the States, Ohio is the leading producer of machine tools. Other important States are Connecticut, Michigan, Massachusetts, Vermont, Rhode Island, Illinois, and Wisconsin.

Indications are that the expected increase in employment will occur in the existing centers of machine tool production. This follows the pattern of World War II, when the distribution of employment in the peak period was substantially the same as that of the industry in the beginning of the expansion.

The Machine Tool Labor Force

Skilled workers form a high peoportion of the labor force in this industry. A survey in the fall of 1950 showed that 3 out of 8 plant workers were skilled craftsmen. Nearly half of the industry's plant workers are found in three occupational groups: machine tool operators, assemblers, and inspectors. In addition, the industry employs skilled machinists and tool and die makers. (These two occupations are on the Department of Labor's List of Critical Occupations.) Among the key professional and technical employees are mechanical engineers, tool designers, and draftsmen. Women make up about 10 percent of the work force; most of them have office jobs or are among the less-skilled machine tool operators. Table 4 presents employment in some of the industry's key occupations.

Table 4

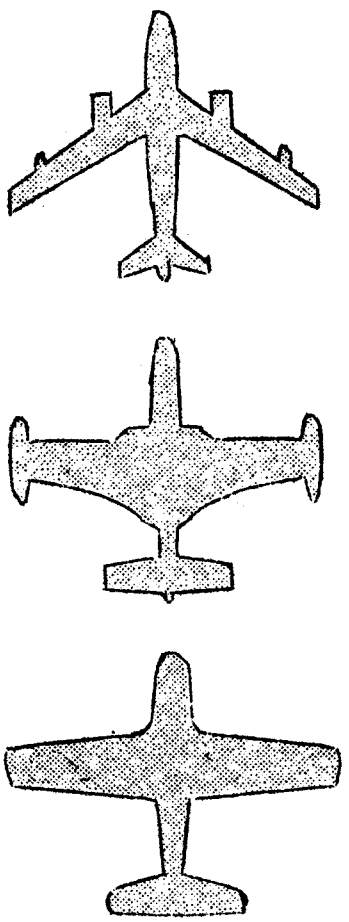
ESTIMATED NUMBER OF WORKERS IN SELECTED KEY OCCUPATIONS
IN THE MACHINE TOOL INDUSTRY, FEBRUARY 1951

Occupations	Number of Workers
Department foremen, process, non-working	2,750
Draftsmen	1,650
Mechanical engineers	1,375
Tool designers	600
Assemblers, bench and floor, Class A	3,850
Assemblers, bench and floor, Class B	2,160
Assemblers, bench and floor, Class C	860
Crane operators (electric-bridge)	440
Heat treaters, Class A	330
Inspectors, Class A	935
Inspectors, Class B	600
Inspectors, Class C	275
Machine-tool operators, Class A	11,220
Machine-tool operators, Class B	3,800
Machine-tool operators, Class C	1,600
Machinists, production and maintenance	500
Maintenance mechanics	275
Millwrights	220
Set-up men, machine tools	165
Tool and/or die makers	1,050

AIRCRAFT

. . . . employment expanding rapidly

For the second time in a decade, the aircraft manufacturing industry is rapidly expanding its plant and work force in order to produce war planes for the United States and its allies. 1/ The United States Air Force plans an air arm of 95 wings by October 1952, compared to the 81 wings as of April 1 of this year. Naval aviation will also achieve a moderate increase in strength by mid 1952. Under the Mutual Defense Assistance Program, other nations are already receiving combat aircraft from this country and the flow will increase. In addition, the Defense Production Administration has approved the production of a number of civilian airline transport planes over the next two years to insure the availability of a modern and efficient air transportation fleet in the event of full mobilization. The airframe industry has an overall goal requested by the President--the capacity to produce 50,000 planes a year.



To attain these goals, the industry may have to more than double current employment by the end of 1952. Recruiting has been proceeding vigorously since the outbreak of hostilities in Korea. Between June 1950 and March 1951, 93,400 workers were added to the payrolls, boosting total employment from 170,500 to 263,900. Preliminary reports for April indicate a substantial expansion over March employment.

Shipments have not kept pace with this sharp increase in

1/ The aircraft manufacturing industry includes establishments primarily engaged in manufacturing or assembling complete aircraft. It excludes establishments primarily engaged in producing engines, propellors, and parts, and subcontractors who do not produce complete aircraft.

employment. Plants have been busy preparing for higher production rates, training new personnel, and filling material pipelines. Moreover, since airplanes have long production cycles, heavy shipments from recent orders may not appear for some months.

Several favorable factors will facilitate a rapid conversion to quantity production. A fund of experience and managerial skill exists from the World War II period and the industry has substantial reserves of plant facilities and machine tools. In addition, there are many models of operationally tested airplanes ready for quantity production.

On the unfavorable side, the greater complexity and weight of current airplanes requires more man-hours, more skill, and more materials than earlier types. The industry's needs for engineers, designers, scientists, and skilled craftsmen will be particularly difficult to fill because of the current shortages of such personnel.

Trends in Employment

Aircraft employment generally expands and contracts with changes in the military needs of the United States. In 1939, less than a quarter of the 5,856 planes produced were military craft since only a modest military air arm was then contemplated. The Germans had not yet demonstrated the effectiveness of air power. The civilian market for airplanes was limited. Commercial air transport was growing, but still in its infancy, and there was little personal plane flying. Total employment in the aircraft manufacturing industry was only 59,000 in January 1940. 2/

In the spring of 1940, President Roosevelt called for a goal of 50,000 planes a year. This goal was more than doubled after Pearl Harbor. The airframe industry expanded tremendously. By 1943, it employed an average of 874,175 workers. This figure does not include employment in subcontracting plants. During that peak employment year, 86,000 planes were produced.

Employment plummeted at the end of the war, but the industry managed to retain many of its skilled workers. Until the current expansion, there were only minor fluctua-

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2/ Employment figures used for the period prior to January 1947 are based on estimates prepared by the Division of Construction and Public Employment of the Bureau of Labor Statistics.

tions in employment during the postwar period. The increased employment during late 1946 and early 1947 (see Table 1) reflected a demand for civilian planes. Flight training schools bought many light planes and commercial airlines added a large number of transports. After this spurt, civilian plane orders began a downward trend which continued through 1950, forcing several personal plane builders to shut down.

Since 1947, employment has varied with the size of military appropriations for aircraft. (See below). The 12 percent increase in employment from 1948 to 1949 reflected the

Appropriations for Military Aircraft
Fiscal years ended June 30
(million dollars)

1946	$ 414.9
1947	670.3
1948	887.9
1949	2,700.7
1950	1,753.6
1951	6,621.0

tripling of military aircraft purchasses in fiscal 1949. The reduction in appropriations for fiscal 1950 brought an employment decline in late 1949 and early 1950. The United States entrance into the Korean War caused a jump in appropriations and a sharp upturn in the employment trend.

Table 1

Employment in the Aircraft Manufacturing Industry
1947 - 1951
(in thousands)

Month	Year				
	1947	1948	1949	1950	1951
Average	151.4	151.7	169.7	184.0	
January	165.0	148.3	168.5	166.8	234.7
February	162.0	148.6	168.9	166.1	252.6
March	159.1	148.9	171.0	166.5	263.9 p
April	161.2	150.8	171.0	167.9	
May	152.2	137.3	169.8	169.0	
June	148.0	140.9	169.3	170.5	
July	142.8	144.5	172.8	172.8	
August	143.4	150.7	171.7	183.7	
September	143.2	153.7	171.2	195.8	
October	145.2	161.7	168.8	205.0	
November	147.0	166.3	166.8	217.6	
December	147.6	168.3	167.0	226.5	

p - preliminary

Trend in Shipments and Types of Aircraft

Shipments of aircraft, like employment, have been closely related to military needs. Aircraft development has also depended on military funds for continues research.

During the war year of 1944, the industry produced more than a billion airframe pounds of aircraft. The latter craft were, for the most part, airplanes with piston powered engines, a very few helicopters, and some gliders.

In 1946, shipments fell to 38,400,000 airframe pounds (see Table 2). Personal planes were the industry's major product that year comprising 52 percent of total shipments. After 1947, shipments of aircraft were preponderantly military. Military contracts awarded the industry for the development of improved craft have resulted in the delivery of bigger and more complex jet and piston powered planes and several improved types of helicopters.

During these postwar years, some plants attempted to use their idle capacity for the production of non-aeronautical products like gas appliances and aluminum boats and trailers. None of these ventures proved very successful and by late 1950, most of them had been discontinued.

Table 2

Aircraft Shipments by Airframe Weight
(weight in thousands of pounds)

Year	Total 1/		Military		Transport		Personal	
	Weight	Percent of Total	Weight	Percent of Total	Weight	Percent of Total	Weight	Percent of Total
1944	962,406	100	962,406	100	--	--	--	--
1946	38,260	100	12,790	33	5,460	14	20,040	52
1947	29,190	100	11,340	39	6,460	22	11,400	39
1948	35,260	100	25,130	71	4,800	14	5,280	15
1949	36,540	100	29,800	82	4,320	12	2,430	7
1950 2/	42,920	100	37,000 2/	86	3,300	8	2,620	6

1/ Segments may not add to total because of rounding.
2/ Military total estimated by Aircraft Industry Association.
SOURCE: Civil Aeronautics Administration.

The variety of current and contemplated models of military aircraft is greater than ever before. Jet powered fighters and bombers of ever increasing speeds are being developed and used by our armed forces. At the same time, the helicopter has become an integral part of our military forces. Nicknamed the "jeep of the Korean War", the usefulness of the craft is such that more are on order now than were built during the entire period of World War II. The Army is considering the use of large numbers of these craft in the movement of men and supplies.

Other types of aircraft and guided missiles are either already in production or approaching it. Guided missiles are assuming greater importance in aircraft production. Rocket propelled craft are in the experimental stage, and the development of atomic powered aircraft is now being studied.

Location of the Industry

More than half the aircraft industry is now concentrated on the West Coast. Some 51.5 percent of the industry's employment was located there in February, 1951; including 41.8 percent in California. Other States with substantial aircraft manufacturing are: Washington, Texas, Kansas, and New York (see Table 3). The industry is made up of relatively few plants, with those of large size predominating.

The West Coast also contained the major concentration of the industry in 1940, but a deliberate policy was adopted of decentralizing the industry inland to lessen its vulnerability to air attack. As a result, by 1944, employment on the West Coast declined, relatively, from 60 to about 22 percent of total airframe employment.

A similar shift may occur during the next year and a half. The reopening of reserve plants, conversion of other plants to airframe production, and the building of new facilities will reduce the relative size of the West Coast segment of the industry. Substantial employment will again appear in the States of Tennessee, Georgia, Oklahoma, and Michigan.

Occupational Requirements

Numerous skills are needed in the manufacture of aircraft. Airplanes never become completely standardized but undergo constant improvement. Therefore, a large staff of professional,

Table 3

Percentage Distribution of Aircraft
Employment by State
June 1950, January and February 1951

State	1950 June	1951 January	1951 February
Total	100.0	100.0	100.0
New York	10.3	10.2	10.0
New Jersey	.6	.4	.3
Pennsylvania	.9	.9	1.0
Ohio	3.1	2.4	2.3
Missouri	3.2	2.9	2.8
Kansas	8.7	10.0	10.5
Maryland	7.6	5.4	6.7
Texas	13.9	14.9	14.3
Washington	10.4	10.0	9.7
California	40.5	42.3	41.8
Other states	.8	.6	.6

scientific, and technical employees is required. In June 1950, they comprised 9 percent of total employment. Engineers and draftsmen are among the largest occupations in this group.

Although most of the plant workers are semiskilled, a great number of highly skilled craftsmen are also employed. One large company has some 628 job classifications which illustrates the broad range of occupations and skills required. Light plane manufacturers have a simpler occupational structure. The airframe industry is currently advertising by radio, television, and newspaper for workers in the following list of jobs. Most of these jobs are on the Labor Department's list of Critical Occupations (indicated by asterisk).

*Engineers (all types)
*Draftsmen (all types)
*Electronic technicians
*Mathematicians
Stress analyst
*Tool and die maker
Tool grinders
Jig and fixture workers
*Aircraft and engine mechanics
Milling machine operators
Engine lathe operators
Template maker
Burrbench operator
*Aircraft loftsmen
*Model makers
Sewing machine operator
Precision grinders
*Aircraft electricians
*Aircraft instrument mechanics
*Aircraft assembly mechanic
*Aircraft engine assembly mechanic

The complexity of modern aircraft requires the employment of an increased number of engineers. For example, the Lockheed Aircraft Corporation reports that it is currently spending an hour of engineering for every four hours of factory work, while in 1945 the ratio was but 1 to 10. Electronic and electro-mechanical engineers are needed in great numbers. The latter group probably outnumbers aero-dynamic engineers at the present time, a reversal of importance since the end of the war.

Semiskilled plant workers and trainees are now being hired in increasing numbers by the industry. As in World War II, many jobs are being broken down to make the maximum use of the limited supply of skilled workers. The latter are being placed in supervisory and key production positions while their former jobs are divided into simpler units that can be handled by the less skilled. The will increase the proportion of unskilled workers in the industry's labor force.

The composition of the work force may undergo some further changes in the near future. Improved machinery may reduce both skilled and overall manpower needs. At the same time, new products such as guided missiles, which require greater precision and highly polished outer surfaces, may require the addition of new skills.

Employment Outlook

By late 1952, airframe employment will probably more than double the March 1951 figure of 263,900. This estimate does not include employment in plants working on subcontracts. Prime contractors are expected to expand subcontracting to speed up production. This will also limit their own plant expansion and cushion future readjustment in case of a sudden reduction in orders. Many prime contractors are now also busy with subcontract work. Increased aircraft procurement may require the transfer of some of this work to plants outside the industry.

The estimate of future employment is based on currently programmed military aircraft procurements, the level of civilian transport production approved by the Defense Production Administration, and a light plane production of about 2500 planes per year. It is also assumed that there will not be a significant change in international relations.

The increase in the volume and length of runs will permit reductions in manhour requirements per airframe pound in

the coming months. This was the experience during World War II when output per manhour increased substantially between 1940 and 1944. The same trend reappeared in 1949 according to preliminary estimates, when the volume of plane manufacturing increased moderately. However, radical changes in the types of aircraft built could delay the expected reduction in manhours.

Standby plants to be reopened in the coming year will probably staffed initially by a nucleus of workers transferred from present plants, but the recruitment of former employees in each locality will undoubtedly be pressed. Most of the plants in this industry are not favorably located to readily absorb workers displaced from cutback civilian plants in the Eastern and Midwestern industrial areas. Additional labor may be obtained by hiring more women and by extending the workweek.

Employment levels in industry will remain high beyond 1952 if international relations remain unchanged. Production of improved models of planes and the development of guided missiles will require substantial employment. An increased demand for civilian planes may also possibly result from increased air travel and a more widespread use of aircraft for business, agriculture, and pleasure.

Employment of Women

The proportion of women employed in this industry rose from 12 percent in June 1950 to 14 percent in February 1951. By contrast, a peak proportion of about 40 percent was reached during World War II. In 1943, about 350,000 women were employed in airframe plants while in February 1951, the total was about 35,000.

In February 1951, there were significant differences in the proportion of women employed among regions. New York employed the lowest proportion of any State with major airframe plants. Kansas and Washington employed a somewhat higher proportion, and California reported the highest proportion.

The increased weight of present aircraft and component parts has been cited as a deterrent to the employment of women. There are, nevertheless, numerous jobs which women are currently performing satisfactorily. A partial list of these includes:

Radio and electric bench assembly	Tool crib attendants
Drill press operator	Shipping
Light riveting	Paint and processing
Welders--light and spot	Inspector
Production control clerks	Sewing machine operator
Magnetic machine inspectors	Tube bender
Wiring	Tube cutter

Trend in the Workweek

The industry has increased its workweek sharply since June 1950. In March 1951, average weekly hours were 43.9 compared to 40.5 in June 1950 (see Table 4) and hours are still increasing. In April several plants reported growing numbers of plant workers working Saturdays. Engineering and technical workers have been on an extended workweek for some time.

Trend in Earnings

Weekly earnings of production workers increased 17 percent between June 1950 and March 1951 (see Table 4). This gain reflects the sharp increase in hours and a wage increase of about 6 percent obtained in the fall of 1950. The small rise in hourly earnings between February and March, despite increased overtime, is attributable in part to the increased number of unskilled and semiskilled workers.

Table 4

Hours and Earnings of Production Workers in the Aircraft Industry, 1947-1951

Year and Month		Average Weekly Earnings	Average Weekly Earnings	Average Hourly Earnings
1947		$53.99	39.7	$1.360
1948		60.21	41.1	1.564
1949		62.69	40.5	1.548
1950		67.15	41.4	1.622
1950	June	64.48	40.5	1.592
	July	64.99	40.8	1.593
	August	68.29	42.6	1.603
	September	70.50	42.7	1.651
	October	69.17	42.1	1.643
	November	68.68	41.5	1.655
	December	72.08	42.6	1.690
1951	January	74.52	43.2	1.725
	February	74.18	43.1	1.721
	March	75.68 p	43.9 p	1.724 p

p - preliminary

Trend in Labor Turnover

The rate of quits in the aircraft industry is not unfavorable when compared to the average for all durable goods manufacturing industries (see Table 5). In any period of heavy hiring, quits increase as people leave their jobs to accept alternative employment opportunities or because they are unadaptable to the type of work.

Quits have risen sharply in several areas where there is a very critical labor supply. These areas are: Seattle, Wash., Wichita, Kansas, Forth Worth, Texas, and San Diego, California.

Table 5

LABOR TURNOVER
(rate per 100)

	Aircraft Manufacturing		Durable Goods Manufacturing	
	Accessions	Quits	Accessions	Quits
1950				
January	2.95	1.09	4.06	.96
February	2.12	1.04	3.56	.91
March	3.38	1.26	4.15	1.11
April	3.13	1.26	4.00	1.28
May	3.15	1.32	5.13	1.72
June	4.00	1.58	5.21	1.87
July	5.34	1.53	5.04	1.94
August	10.50	2.46	7.18	3.05
September	8.66	3.35	6.38	3.59
October	8.70	2.72	5.84	2.88
November	7.80	2.18	4.36	2.27
December	7.35	1.94	3.42	1.75
1951				
January	11.2	2.7	5.7	2.2
February	8.0	2.5	5.0	2.2
March	8.4 p	3.7 p	5.3 p	2.8 p

p - preliminary