

Mr. Ford JSW

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Business and Financial Conditions in the United States

Industrial activity and factory employment declined further from October to November, reflecting in part the usual seasonal tendencies. Continued gold imports and further reduction in member bank reserve requirements during November and the first half of December were reflected in a considerable decline in the outstanding volume of reserve bank credit.

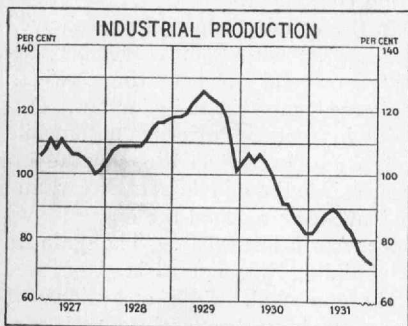
Production and employment. In November industrial production showed a somewhat larger decrease than is usual at this season and the Board's seasonally adjusted index declined from 73 to 72 per cent of the 1923-1925 average. Activity declined at woolen mills, lumber mills, and coal mines, while daily average output at steel mills increased and volume of automobile production showed less than the usual seasonal decline from the low level of October. The November increase in steel production was followed by a considerable decline in the first three weeks of De-

ember. Output of petroleum increased further in November to a level slightly lower than that prevailing last summer before output was sharply curtailed.

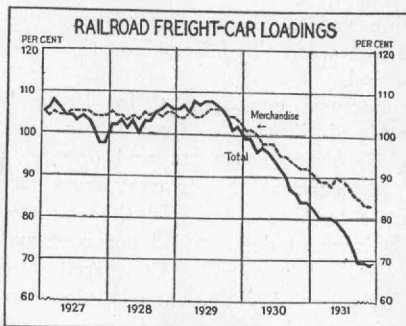
Volume of employment in most manufacturing industries declined by more than the seasonal amount between the middle of October and the middle of November. Reductions were particularly large in the wearing apparel, leather, and building materials industries, while in the automobile and tire industries declines were smaller than usual at this season.

The value of building contracts awarded, as reported by the F. W. Dodge Corporation, has declined further in recent months and a preliminary estimate of the Board's seasonally adjusted index for the last quarter of 1931 is 49 per cent of the 1923-1925 average, compared with 59 for the third quarter, 65 for the second quarter, and 79 for the first quarter of the year; part of this decline in dollar volume reflects lower building costs.

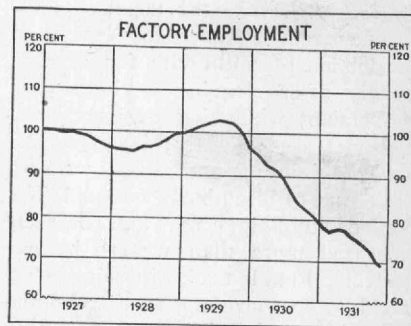
Production of principal crops in 1931 was about 10 per cent larger than in 1930, according to the December crop report of the Department of Agriculture, while acreage harvested was slightly smaller than a year ago. There were large increases in the crops of cotton, corn, winter wheat, apples, and peaches, while the harvests of oats, barley, and rye were smaller than last year; as in 1930 the hay crop was unusually small.



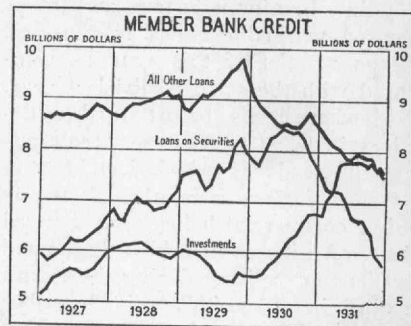
Index number of industrial production, adjusted for seasonal variation. (1923-25 average = 100.)



Indexes of daily average number of cars loaded; adjusted for seasonal variation. (1923-1925 average = 100.)



Federal Reserve Board's index of factory employment with adjustment for seasonal variation. (1923-1925 average = 100.)



Monthly averages of weekly figures for reporting member banks in leading cities. Latest figures are averages of first two weeks in December.

Distribution. Commodity distribution continued at about the same rate in November as in October, the volume of freight car loadings showing a seasonal decline, while sales of department stores increased by about the usual amount for that month.

Wholesale prices. The general level of wholesale prices remained practically unchanged from October to November, according to the Bureau of Labor Statistics index, prices of grains, petroleum, and silver advanced, while those of livestock and dairy products showed declines, partly of a seasonal character. Between the middle of November and the middle of December there were decreases in the prices of many leading commodities including livestock, meats, grains, sugar, silk and silver; during this period prices of copper and rubber showed a decline, followed by a recovery.

Bank credit. Volume of reserve bank credit outstanding declined during November and the first half of December, and averaged \$360,000,000 less in the week ending December 12 than at its October peak seven weeks earlier. The decrease was in large part in the banks' portfolio of acceptances, as discounts for member banks and holdings of United States government securities showed little change for the period. The decline in total volume of reserve bank credit outstanding during the period reflected a growth of \$100,000,000 in the stock of monetary gold, largely through imports from Japan, and continued reduction in the reserve balances of member banks reflecting a further liquidation of member bank credit. Demand for currency declined during the last three weeks of November and showed considerably less than usual seasonal increase in

the first half of December. After the middle of December, however, bank suspensions in New England were followed by some increased withdrawals of currency, part of which has begun to return.

Loans and investments of member banks in leading cities continued to decline and on December 9 were \$370,000,000 smaller than four weeks earlier. The decrease was equally divided between the banks' loans and their investments. Deposits of these banks, both demand and time, also showed a decrease with a consequent reduction in required reserves.

Money rates in the open market showed little change from the middle of November to the middle of December. Rates on prime commercial paper continued at $3\frac{3}{4}$ to 4 per cent while rates on 90-day bankers' acceptances advanced from $2\frac{7}{8}$ to 3 per cent on November 25.

Business and Financial Conditions in the Philadelphia Federal Reserve District

Industrial activity slackened considerably in November and early December. Output of manufactures showed more than the usual seasonal decline from October to November. Production of anthracite fell off materially after showing a sharp gain in October, while that of bituminous coal increased slightly; in early December mining of anthracite increased while that of bituminous declined. The value of building permits and contracts decreased more than was to be expected. Retail trade in November failed to measure up to the volume of past years but it was quite active in early December. Wholesale business continues seasonally quiet. Business in all major industries and trades showed marked declines in the first eleven months of this year as compared with the same period last year.

Member banks report further declines in loans to customers, continuing the tendency which has been in progress for many months. Rates on prime commercial loans have changed little. An increase in bills discounted by the reserve bank during the month ending in the middle of December seems to have resulted chiefly from Treasury operations; currency demand was exceptionally quiet, giving little

indication of the strong increase usual at this season.

Manufacturing. Demand for manufactured products has fallen off as it usually does toward the end of the year. Unfilled orders for finished goods are smaller than a month ago and as compared with last year. Recessions in wholesale prices continued, although the decline was comparatively small.

Stocks of finished merchandise at plants decreased from the preceding month; they were also smaller than in early December last year. The latest available national index shows that inventories of manufactured goods in October were the lowest in nine years, while those of raw materials were the largest for the same period.

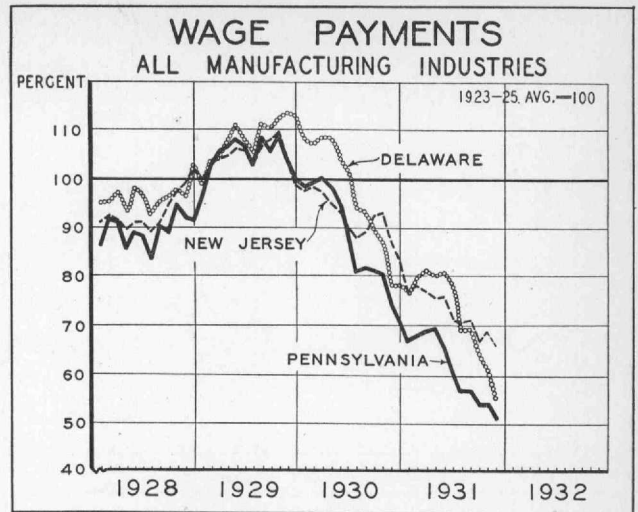
Factory employment in Pennsylvania declined less than 1 per cent, while wage payments and operating time decreased 5 per cent from October to November. In the country, employment decreased 3 per cent and payrolls 5 per cent. Compared with November 1930, Pennsylvania factories employed 16 per cent fewer workers and paid out 31 per cent less in wages. Similarly, national indexes

showed a drop of 15 per cent in factory employment and 25 per cent in payrolls, indicating curtailment of operations.

Productive activity in manufacturing declined 3 per cent more than it usually does between October and November. This drop may be attributed chiefly to further curtailment of activity in metals, textiles, building materials, and paper and printing. The preliminary index, at 71 per cent of the 1923-25 average, was 20 per cent lower than in November 1930. The sharpest declines from a year ago occurred in metal products, building materials, paper and printing, radio and musical instruments, and transportation equipment.

In the metal group all items showed declines in output in November except iron and steel castings, which registered gains in daily output. Activity in factories making automobile bodies and parts has been on the increase since the middle of the year, and in November reached the highest level since April last year. The gain in shipbuilding was not as large as was to be expected, while operations of plants making locomotives and cars and motor vehicles declined further.

After reaching a peak in August



and September, output of textile products fell off more than usual in the two following months, all lines sharing in the recession except knit underwear.

Canning and preserving and output of ice cream measured up to seasonal volumes, even though the totals were smaller than in several years past; other lines in the food group registered declines during the month. Production of cigars held more than its ground, although November was the third smallest month since 1924.

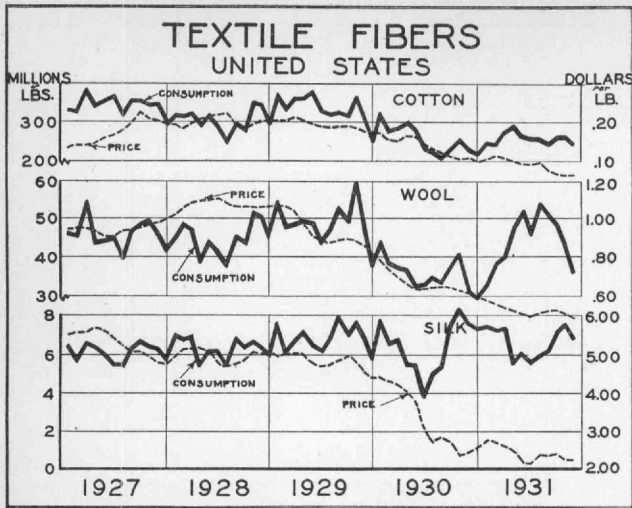
A decline of 11 per cent in the output of shoes was somewhat smaller than is customary for November; the drop in the country's shoe production was 15 per cent from October to November. Activity in the leather tanning industry also declined seasonally. The hide market generally is quiet and prices show continued weakness.

In the building materials group, operations of plants making cement, and paints and varnishes were more active than ordinarily was to be expected, while the output of brick, and lumber and planing mill products declined as usual. Production of explosives and oil and petroleum products showed rather exceptional gains.

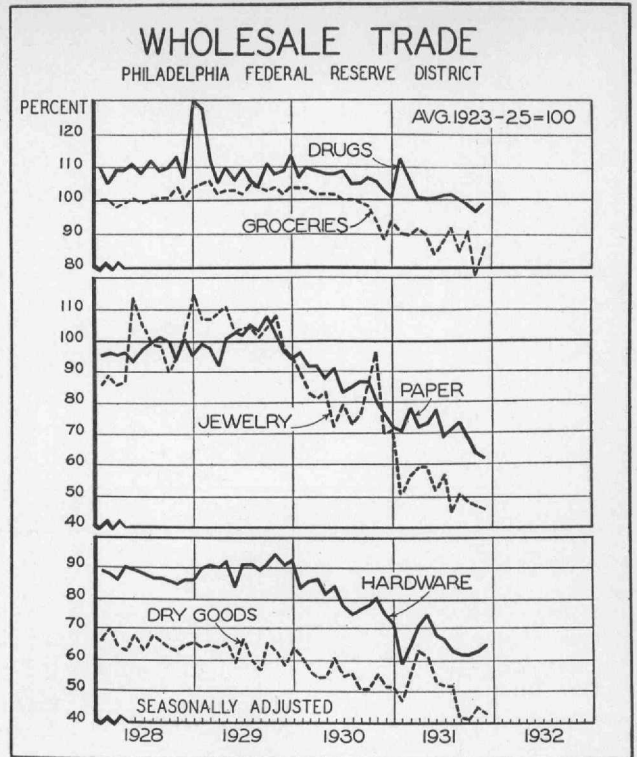
Electric power output was smaller in November than October, which is contrary to the usual seasonal tendency; it was also less than a year ago. The use of electrical energy by industries declined slightly in November, and it was 10 per cent below the quantity consumed a year ago. Detailed comparisons follow:

Business indicators Philadelphia Federal Reserve District	November, 1931		
	Amount	Percentage change since	
		Oct., 1931	Nov., 1930
Retail trade* —estimated net sales (161 stores).....	\$832,600	+ 1.8	- 20.0
Department (67).....	\$722,700	+ 2.3	- 19.8
Men's apparel (25).....	\$22,500	+ 8.8	- 23.9
Women's apparel (15).....	\$62,500	- 1.9	- 17.3
Shoe (36).....	\$8,700	- 9.4	- 31.4
Credit (18).....	\$16,200	- 6.9	- 24.6
Wholesale trade* —net sales (100 firms).....	\$247,562	+ 4.4	- 12.6
Boots and shoes (5).....	\$3,654	- 13.9	- 3.0
Drugs (10).....	\$54,238	+ 6.3	- 4.3
Dry goods (12).....	\$12,343	- 6.2	- 16.5
Electrical supplies (8).....	\$10,208	- 8.5	- 46.7
Groceries (29).....	\$93,323	+ 10.7	- 3.1
Hardware (20).....	\$50,784	+ 1.7	- 12.7
Jewelry (9).....	\$10,436	+ 3.5	- 34.6
Paper (7).....	\$12,576	- 4.1	- 17.5
Productive activity* —			
Employment—823 plants in Penna.....	246,153	- 0.7	- 15.6
Wage payments (weekly average).....	\$4,639,280	- 5.0	- 31.4
Shoe production†—80 factories..... prs.	41,434	- 10.8	—
Hosiery production†—133 mills..... doz. prs.	58,952	- 5.1	—
Underwear production†—53 mills..... doz. pes.	13,716	+ 1.6	—
Wool consumption†—60 mills..... lbs.	209,766	- 21.8	—
Active cotton spindle hours.....	514,291	- 0.4	- 20.3
Pig iron production..... tons.	2,568	- 2.2	- 47.1
Iron casting production—31 foundries..... tons.	95	+ 9.0	- 38.5
Steel casting production—9 foundries..... tons.	83	+ 2.7	- 40.8
Anthracite..... tons.	180,000	- 28.6	- 19.1
Bituminous coal—Penna..... tons.	306,300	+ 1.7	- 24.4
Petroleum receipts at Port of Philadelphia..... bbls.	40,200	- 7.6	- 25.8
Cement..... bbls.	68,200	- 10.8	- 14.4
Electric power output—11 systems..... KWH.	17,633,900	- 3.2	- 1.3
Financial and credit* —			
Debits (check payments)*—17 cities.....	\$76,254,500	- 13.5	- 26.3
Loans and investments—December 16 reporting member banks in 4 cities.....	\$1,240,000,000	+ 0.6	- 5.6
Bills discounted held by F. R. B. of Phila. (daily average).....	\$108,311,000	+ 21.3	+ 452.5
Bankers' acceptances outstanding—end of month.....	\$17,289,000	+ 0.5	- 32.0
Commercial paper sales*—4 dealers.....	\$24,875	- 31.2	- 89.8
Commercial failures—number.....	130	- 21.2	+ 39.8
Commercial failures—liabilities.....	\$5,199,363	- 41.7	+ 27.8
Building and real estate* —			
Building permits*—17 cities.....	\$113,458	- 28.6	- 75.9
Building contracts awarded*.....	\$331,100	- 66.3	- 49.0
Number of real estate deeds recorded* (Philadelphia county).....	182	- 11.7	- 7.6
Value of mortgages recorded* (Philadelphia county).....	\$309,461	+ 18.4	- 50.0
Sheriff sales writs issued for December—(Philadelphia county).....	1,832	+ 35.0	+ 49.6
Miscellaneous* —			
Freight car loadings (Allegheny district).....	21,770	- 9.1	- 20.1
Sales of life insurance (Penna., N. J., and Del.).....	\$4,487,300	+ 28.9	- 2.7
Automobile sales registrations of new passenger cars.....	292	- 10.4	- 3.3

* Daily average of monthly figures. † Bureau of the Census preliminary figures.



Sources: Department of Commerce, Fairchild's Publications, Dun's Review



Electric power Philadelphia Federal Reserve District 11 systems	Nov., 1931, per cent change from	
	Nov., 1930	Oct., 1931
Rated generator capacity.....	+ 1.9	0.0
Generated output.....	- 1.3	- 3.2
Hydro-electric.....	+26.8	-14.9
Steam.....	- 7.4	- 2.6
Purchased.....	+19.5	- 2.7
Sales of electricity.....	- 3.3	+ 3.9
Lighting.....	+ 6.7	+16.0
Municipal.....	+ 2.7	+11.5
Residential and commercial.....	+ 7.2	+16.6
Power.....	-10.4	+ 0.3
Municipal.....	+ 7.6	+10.8
Street cars and railroads.....	-13.8	+ 2.0
Industries*.....	-10.2	- 0.2
All other sales.....	+38.1	+ 4.2

* Working days average—other items are computed on calendar days.

Building. Awards of contracts for building construction during November were about one-third of those let in October, which was a much sharper decline than usual. All classes of construction, except factories, sustained marked losses in the value of contracts awarded, and the November volume was the lowest in many years. Awards in the first half of December decreased further and were less than one-half the volume of a year ago. The drop in building permits in November was slightly more than seasonal; permits in November were only about one-fourth of those a year ago.

Employment in building construction in Pennsylvania was 10 per cent smaller and wage payments 11 per cent less in November than October. The drop in payrolls varied from 10 per cent in Philadelphia and Erie to 19 per cent in Reading. Decreases in the

number of employe-hours worked amounted to 11 per cent in Philadelphia, 16 per cent in Scranton, and 18 per cent in Reading, showing largely seasonal curtailments in operations.

Contracts awarded in selected cities and district	Eleven months 1931 (000's omitted)	Per cent change from	
		1930	1926-29 average
Philadelphia.....	\$ 52,664	-55.4	-71.3
Reading.....	3,108	+ 6.6	-50.0
Scranton.....	1,195	-67.5	-71.6
Camden.....	2,137	-49.8	-77.1
Trenton.....	3,627	+ 2.9	-56.6
Wilmington.....	3,781	-45.7	-45.1
"All other".....	114,371	-33.0	-45.1
District, all cities....	180,882	-41.7	-57.6

Source: F. W. Dodge Corporation.

Agriculture. Owing to sharp declines in the wholesale prices of many farm products, the aggregate value of crops produced in 1931 was substantially lower than in either of the two preceding years. The total acreage harvested this year was only slightly smaller than in 1930, while yields per acre were materially higher.

Preliminary reports indicate that the Pennsylvania tobacco crop was exceptionally high in quality and was the largest produced since 1925; yields of corn, tame hay and white potatoes were substantially larger than those of a year ago, while the wheat and oats harvests were somewhat smaller.

The condition of livestock on farms was generally satisfactory during the

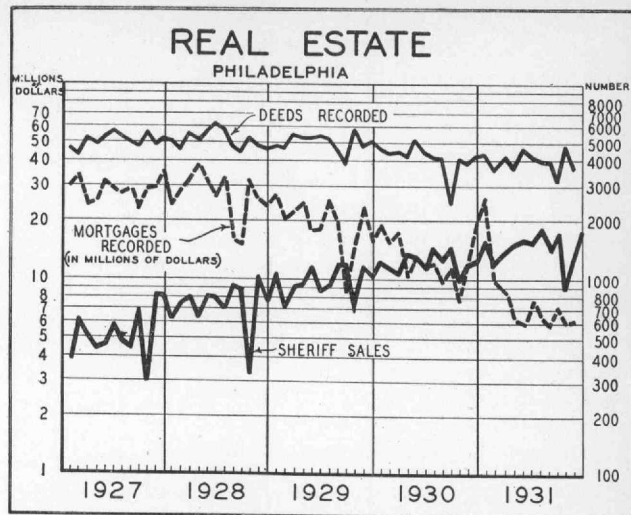
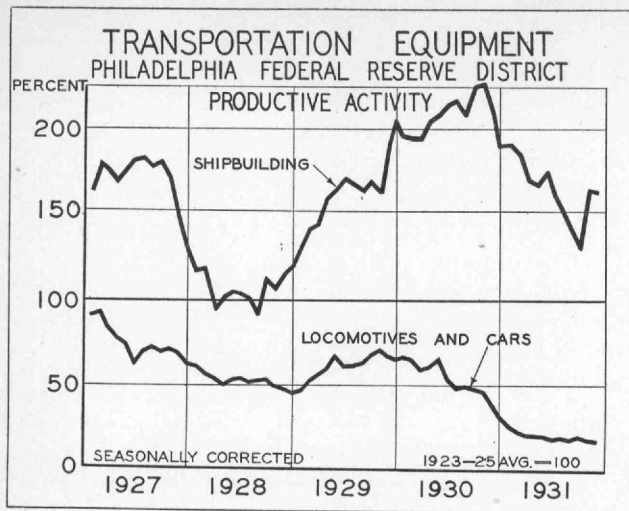
past season; dairy cattle were in healthy condition and yields of milk and butter compared favorably with those of a year earlier. Slaughtering of swine last fall was noticeably larger than in the corresponding period of 1930.

Output of farm products Phila. Fed. Res. Dist.	1931 (000's omitted)	Per cent change	
		1929	1930
Acreage harvested..	5,047	- 1.2	- 0.7
Value of farm crops.	119,515	-33.8	-25.2

Source: U. S. Department of Agriculture.

Coal. The anthracite market has been rather quiet since the middle of November, owing largely to unseasonable weather. Colliery output in November, which averaged 180,000 tons daily, declined sharply and was the second smallest for that month in nine years; in early December the weekly production of mines increased but continued smaller than in the corresponding period of 1930. Shipments also showed a marked reduction and were only slightly above the low level of September. Although prices at wholesale remained unchanged, they were about 5 per cent higher than in November, 1930.

Production of Pennsylvania bituminous coal increased in November;



Source: Philadelphia Real Estate Board

in the first fortnight of December the weekly output of collieries was reduced. Shipments were sharply curtailed in November and were the smallest since August; compared with November 1930, they showed a decline of about 22 per cent. Prices increased fractionally but were noticeably lower than those of a year ago.

Distribution. Retail sales showed a gain of 2 per cent from October to November but this increase was not as large as was to be seasonally expected. In comparison with a year ago, the dollar volume of sales was 20 per cent smaller and for the first eleven months of this year they were 12 per cent smaller, declines ranging from 10 per cent in sales of credit stores to 20 per cent in those of shoe stores. Figures from department and apparel stores in the accompanying table indicate that declines in retail business of Philadelphia stores were more pronounced than those in other leading areas of the district. Continued price recessions, unfavorable industrial conditions, and unseasonable weather explain these adverse comparisons. Preliminary reports show that seasonal sales in early December were stimulated considerably by colder weather.

Inventories at retail establishments increased 3 per cent from October to November but were 15 per cent smaller than a year earlier. The rate of turnover was slightly higher this year than last. The ratio of collections during November to outstanding balances at the beginning of that month was 30 per cent as compared

Retail trade Philadelphia Federal Reserve District November, 1931	Percentage change				Rate of turnover eleven months		Ratios of collections to receivables, November	
	Net sales: 1931, compared with 1930		Stocks: Nov. 30, 1931, compared with		1930	1931	1930	1931
	Nov.	Eleven months	Nov. 30, 1930	Oct. 31, 1931				
All reporting stores.....	-20.0	-12.2	-14.5	+ 3.4	3.41	3.47	30.7	29.6
Department.....	-19.8	-12.1	-14.2	+ 3.7	3.43	3.47	.....	.....
in Philadelphia.....	-20.5	-13.5	-14.0	+ 4.7	3.77	3.72	.....	.....
outside Philadelphia.....	-18.0	- 8.7	-14.7	+ 1.7	2.73	2.94	35.1	32.3
Men's apparel.....	-23.9	-16.2	-13.5	+ 8.0	1.98	1.96	.....	.....
in Philadelphia.....	-29.3	-20.1	-16.3	+21.0	2.16	2.11	.....	.....
outside Philadelphia.....	-19.8	-13.0	-11.4	+ 0.8	1.84	1.85	32.7	28.6
Women's apparel.....	-17.3	-10.7	-17.8	- 4.5	5.55	5.94	.....	.....
in Philadelphia.....	-18.1	-10.7	-18.8	- 5.3	5.87	6.37	.....	.....
outside Philadelphia.....	-11.5	-11.0	-12.3	- 0.3	3.64	3.60	33.5	30.8
Shoe.....	-31.4	-19.9	-17.7	- 4.5	2.42	2.33	23.7	30.3
Credit.....	-24.6	-10.1	-17.4	+ 4.2	2.24	2.47	11.5	10.1

Wholesale trade Philadelphia Federal Reserve District November, 1931 (Percentage change is indicated by + and - signs)	Boots and shoes	Drugs	Dry goods	Elec- trical supplies	Grocer- ies	Hard- ware	Jewelry	Paper				
									Net sales— Eleven months 1931 compared with eleven months 1930.....	Nov., 1931, compared with: October, 1931.....	November, 1930.....	Actual index*: November, 1931.....
Net sales— Eleven months 1931 compared with eleven months 1930.....	-20.6	- 5.0	-17.5	-20.0	-13.4	-19.2	-36.8	-18.7				
Nov., 1931, compared with: October, 1931.....	-13.9	+ 6.3	- 6.2	- 8.5	+10.7	+ 1.7	+ 3.9	- 4.1				
November, 1930.....	- 3.0	- 4.3	-16.5	-46.7	- 3.1	-12.7	-33.8	-17.5				
Actual index*: November, 1931.....	62.2	101.5	55.8	55.2	93.2	72.6	65.9	65.4				
October, 1931.....	72.2	95.5	59.5	60.3	84.2	71.4	63.4	68.2				
November, 1930.....	64.1	106.1	66.8	103.6	96.2	83.2	99.5	79.3				
Seasonally adjusted index*: November, 1931.....	58.7	98.5	43.3	42.5	85.5	65.4	46.1	62.3				
October, 1931.....	58.2	97.4	44.7	47.1	77.2	62.6	47.3	63.7				
November, 1930.....	60.5	103.0	51.8	79.7	88.3	75.0	69.6	75.5				
Stocks—Nov. 30, 1931 Change from: October 31, 1931.....	.....	+ 0.6	- 9.1	-12.1	- 1.4	- 2.6	- 3.4	- 3.3			
November 30, 1930.....	.....	-10.0	-14.8	-39.1	-17.5	- 2.7	-28.1	-18.0			
Ratios of collections to re- ceivables: November, 1931.....	29.2	79.1	40.7	47.1	84.7	36.3	15.4	50.1				
November, 1930.....	25.5	75.6	40.4	69.2	87.9	36.0	13.6	65.4				

* These indexes are percentages of the 1923-25 average taken as 100.

with 31 per cent a year ago, indicating a slight decline in payment of accounts.

Sales at wholesale were 4 per cent larger in November than October. Exceptional gains were reported by dealers in groceries and hardware; business in drugs was also slightly larger than usual, while the gain in jewelry was not as large as was to be expected. Larger than seasonal declines occurred in the sale of dry goods and paper, while in shoes decreases were a little less than was to be seasonally anticipated. In early December wholesale business slackened as it ordinarily does toward the end of the year.

Compared with November 1930, dollar sales at wholesale were 13 per cent smaller, declines varying from 3 per cent in shoes to 47 per cent in electrical supplies. Sales in the first eleven months of this year were 15 per cent smaller than in the same period last year, reflecting in part the influence of lower prices.

Dealers' stocks declined in November and were appreciably smaller than a year ago. Percentages of collections during November to receivables at the beginning of the month were somewhat higher than a year ago in shoes, drugs, jewelry, dry goods and hardware but lower in electrical supplies, groceries and paper.

Shipments of commodities by railroad freight in this section were 9 per cent smaller than in the preceding month, this decline being somewhat less than usual. Loadings for the year to date as compared with the same

period last year were 21 per cent smaller.

Sales of new automobile passenger cars as measured by registrations declined 10 per cent from October, which was a smaller decline than usual; compared with last year, sales were only 3 per cent smaller.

Financial conditions. The demand for currency has been quiet over the past month and rates on prime commercial loans have shown little change, but member bank loans to customers have declined further.

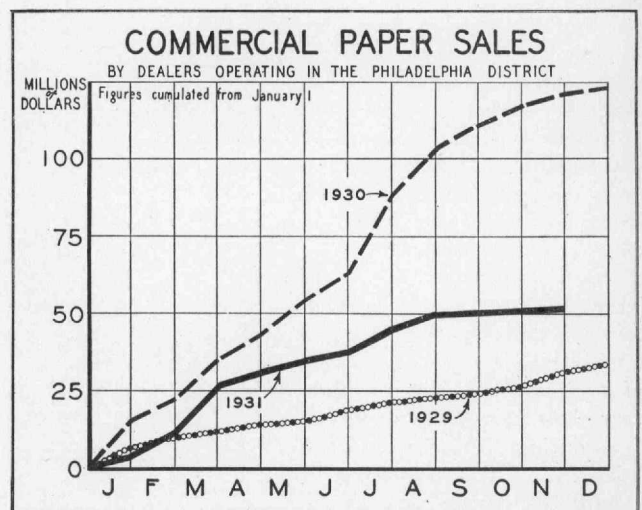
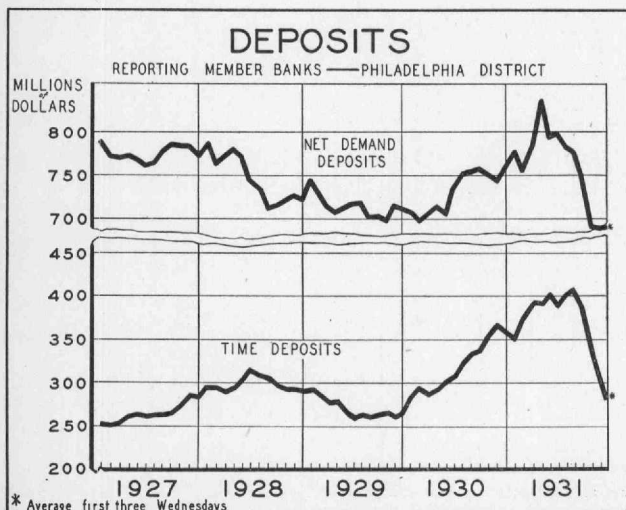
From November 18 to December 16 payments of currency only slightly exceeded receipts, although Christmas savings deposits usually are disbursed in this period and holiday retail sales ordinarily are heavy. Both a year ago

and two years ago at this time of the year the excess of currency payments over receipts amounted to well over 20 millions.

Although currency had slight effect on the demand for reserve bank credit, and payments and receipts in the inter-district settlements almost balanced, there was an increase from 108 to 118 millions in borrowings from this bank, over half of which represented additional loans to Philadelphia banks. This increase may be explained largely by Treasury operations. In the four weeks, government collections, including income tax checks and withdrawals from deposits set up in payment for securities issued several months ago, exceeded local disbursements by about 11 millions; of this amount about 3½ millions was absorbed by the redemption of securities held by this bank.

The reports of member banks in Philadelphia, Camden, Scranton and Wilmington reflect new financing by the government on December 15. United States deposits credited in payment for securities allotted to these banks totaled 40 millions on December 16; practically all of this was in connection with the new issues of December 15, as nearly all of the 10 millions reported a month ago had been withdrawn. Government security holdings increased from 190 to 219 millions. Net demand deposits have been rather stable over the past few months and show an increase of 2 millions in the four weeks, but time deposits show a further decrease from 299 to 273 millions and are at the lowest point since the end of 1929. Customers' loans

Federal Reserve Bank of Philadelphia (Dollar figures in millions)	Dec. 16, 1931	Changes in—	
		Four weeks	One year
Bills discounted for banks in—			
Philadelphia	\$ 64.5	+\$5.4	+\$ 61.0
20 other large cities	28.8	+ 2.9	+ 18.3
Other communities	24.3	+ 1.4	+ 14.1
Total bills discounted	\$117.6	+\$9.7	+\$ 93.4
Bills bought	4.4	- 2.5	+ 0.9
United States securities	54.1	- 4.0	+ 3.1
Other securities	5.8	- 2.0	+ 5.8
Total bills and securities	\$181.9	+\$1.2	+\$103.2
Federal reserve note circulation	273.5	+ 2.1	+ 143.9
Member bank reserve deposits	127.7	- 2.5	- 13.3
Cash reserves	264.1	- 5.8	+ 32.1
Reserve ratio	64.0%	- 0.7%	- 21.5%



decreased from 729 to 713 millions in the month, owing largely to a decline in loans on securities.

Weekly reporting member banks (000,000's omitted)	Sales to—		
	Nov. 18	Dec. 9	Dec. 16
Loans to customers.....	\$ 729	\$ 721	\$ 713
Loans to the open-market	20	18	19
United States securities.....	190	187	219
Other securities.....	293	291	289
Total loans and investments.....	\$1,232	\$1,217	\$1,240
Net demand and time deposits.....	984	972	960
Government deposits.....	10	1	40

During the past year deposits, including net demand, time and government funds, have decreased from 1,137 to 1,000 millions of dollars; loans and investments show a shrinkage of only 74 millions, from 1,314 to 1,240 millions, but borrowings from the Federal Reserve Bank have risen materially.

Commercial paper sales (four dealers)	Sales to—		Total sales
	City banks	Country banks	
1931—Aug....	\$2,635,000	\$2,494,500	\$5,129,500
Sept....	60,000	535,000	595,000
Oct....	0	850,000	850,000
Nov....	0	497,500	497,500
1930—Nov....	3,165,000	1,582,500	4,747,500
1929—Nov....	530,000	3,695,000	4,225,000

City areas*	Percentage change—Nov., 1931, from Nov., 1930.				
	Employment	Wage payments	Building permits (value)	Debits	Retail trade sales
Allentown.....	-24.3	-37.4	-78.6	-20.8	-22.7
Altoona.....	-11.6	-27.9	-81.0	-23.4	-27.6
Harrisburg.....	-23.5	-39.4	+220.8	-19.5	-17.6
Johnstown.....	-45.9	-53.1	-48.7	-31.7	-26.4
Lancaster.....	-3.9	-18.8	-82.9	-22.3	-20.6
Philadelphia.....	-12.4	-23.5	-85.0	-26.6	-20.6
Reading.....	-10.9	-27.0	+38.0	-21.9	-12.4
Seranton.....	-26.9	-28.1	+31.7	-9.0	-8.4
Trenton.....	-12.6	-31.0	+310.7	-4.2	-22.2
Wilkes-Barre.....	-5.5	-21.2	-77.9	-14.6	-12.4
Williamsport.....	-1.8	-1.1	-82.4	-21.2	.....
Wilmington.....	-12.5	-28.0	+62.2	-22.8	-18.3
York.....	-12.5	-31.3	-79.6	-20.6	.....

November, 1931, from October, 1931					
Allentown.....	-3.5	-8.7	-30.1	-25.4	-11.3
Altoona.....	-1.5	-1.8	-56.1	-14.1	-8.7
Harrisburg.....	-2.7	-14.6	+224.9	-22.1	-4.3
Johnstown.....	+3.4	-1.0	-0.3	-25.5	-23.2
Lancaster.....	-3.4	-3.0	+24.3	-31.6	-14.1
Philadelphia.....	-0.8	-5.2	-58.2	-28.4	-9.9
Reading.....	+1.5	-1.4	+169.5	-20.5	-13.7
Seranton.....	+1.0	-1.2	-12.4	-14.4	+19.8
Trenton.....	-0.5	-7.0	-27.1	-21.1	-8.9
Wilkes-Barre.....	-3.9	-1.0	-14.1	-0.9	-4.2
Williamsport.....	-9.3	-11.9	-63.2	-21.3	.....
Wilmington.....	+3.1	-8.3	+20.3	-27.7	-10.2
York.....	-3.4	-10.7	+26.3	-21.4	.....

* Area not restricted to the corporate limits of cities given here.

The composition of the loan and investment total has changed substantially; loans show a decline of 146 millions, chiefly in loans to customers; investments, owing to increased holdings of United States securities, have risen from 436 to 508 millions and the proportion to total loans and investments has advanced from 33 to 41 per cent.

Four dealers reported only \$497,000 of commercial paper sales in November, establishing a new low record for the year; a year ago sales were nearly ten times as great. No sales to Philadelphia banks were reported.

Employment and wages in Pennsylvania	Employment November, 1931			Payrolls November, 1931		
	Nov. index*	Per cent change since		Nov. index*	Per cent change since	
		Nov., 1930	Oct., 1931		Nov., 1930	Oct., 1931
All manufacturing industries (51).....	71.5	-15.6	-0.7	51.3	-31.4	-5.0
Metal products.....	62.8	-23.6	-0.5	39.1	-44.3	-8.6
Blast furnaces.....	37.8	-19.6	-1.0	23.1	-45.9	-8.3
Steel wks. and rolling mills.....	53.8	-27.6	+0.9	31.2	-48.3	-5.5
Iron and steel forgings.....	63.4	-27.1	-8.8	43.2	-49.0	-17.2
Structural iron work.....	85.7	-15.3	-3.9	54.2	-34.0	-14.8
Steam & hot wtr. htg. app.....	84.9	-10.7	-3.7	56.1	-34.4	-15.9
Stoves and furnaces.....	66.5	-13.3	+2.3	53.4	-14.1	-1.1
Foundries.....	59.0	-24.9	-1.7	31.2	-50.4	-5.5
Machinery and parts.....	71.6	-20.4	0.0	47.9	-36.0	+1.9
Electrical apparatus.....	92.5	-17.3	-3.5	67.3	-40.8	-15.5
Engines and pumps.....	43.6	-38.1	+2.3	26.5	-53.9	-10.2
Hardware and tools.....	68.9	-14.1	+2.5	45.4	-29.7	-7.3
Brass and bronze products.....	58.8	-21.6	-3.6	42.4	-36.6	-12.2
Transportation equipment.....	42.7	-34.3	-3.8	34.4	-39.5	+4.2
Automobiles.....	42.8	-4.0	-22.3	19.4	-6.3	-17.8
Auto. bodies and parts.....	62.0	+10.1	+25.0	72.6	+63.9	+31.3
Locomotives and cars.....	19.3	-47.7	-16.1	13.6	-56.7	-8.1
Railroad repair shops.....	66.4	-7.8	+3.6	48.6	-25.7	-4.5
Shipbuilding.....	41.2	-54.1	+2.0	56.3	-60.5	+2.2
Textile products.....	89.3	-7.4	-0.3	75.3	-18.2	-3.0
Cotton goods.....	61.9	+5.1	-3.0	51.0	+1.8	-4.1
Woolens and worsteds.....	60.7	+4.3	-8.9	49.4	0.0	-10.8
Silk goods.....	91.3	-14.7	-2.1	83.8	-24.8	-7.0
Textile dyeing and finishing.....	83.8	-9.2	-0.8	70.7	-19.8	+3.5
Carpets and rugs.....	64.5	+4.7	-3.7	51.5	-1.9	-12.9
Hats.....	74.5	-14.6	+1.2	47.6	-27.8	-17.6
Hosiery.....	115.5	-2.7	+7.1	105.9	-16.6	+9.3
Knit goods, other.....	88.5	-13.1	-4.1	67.6	-37.5	-12.0
Men's clothing.....	67.9	-14.1	-17.7	52.4	-19.5	-27.9
Women's clothing.....	97.3	-15.8	+1.1	79.8	-28.9	+3.1
Shirts and furnishings.....	144.3	0.0	-4.0	116.5	-12.2	-7.0
Foods and tobacco.....	103.1	-3.1	-1.2	90.5	-9.3	-4.0
Bread and bakery products.....	104.9	-5.8	+0.9	95.2	-12.4	-2.1
Confectionery.....	104.1	+2.9	3.1	84.3	0.0	-19.2
Ice cream.....	83.4	-10.9	-6.2	78.9	-15.6	-9.7
Meat packing.....	97.6	+0.2	+1.6	85.5	-8.3	-0.5
Cigars and tobacco.....	100.7	-4.0	-1.2	87.0	-9.4	+5.5
Stone, clay and glass products.....	55.7	-12.8	-3.5	34.4	-31.6	-11.1
Brick, tile and pottery.....	66.6	-12.5	-2.8	35.5	-36.7	-9.9
Cement.....	46.5	-17.8	-5.7	29.0	-33.6	-14.2
Glass.....	59.6	-5.1	-0.2	49.4	-14.8	-3.3
Lumber products.....	55.8	-17.1	-1.4	44.6	-26.0	-7.3
Lumber and planing mills.....	36.7	-31.0	+0.8	30.5	-31.3	-5.0
Furniture.....	62.4	-12.4	-2.0	51.4	-24.3	-4.8
Wooden boxes.....	60.1	-11.0	-2.1	41.4	-25.9	-19.1
Chemical products.....	84.9	-0.7	+2.8	75.3	-13.7	+2.3
Chemicals and drugs.....	63.4	-1.6	0.2	53.5	-16.1	-6.3
Coke.....	60.9	-19.3	-1.0	29.6	-51.5	-8.9
Explosives.....	75.4	-4.7	-0.9	89.8	-3.5	+8.3
Paints and varnishes.....	95.2	+10.3	+11.9	78.0	-8.0	+4.7
Petroleum refining.....	124.5	+8.0	+3.8	123.4	-0.9	+6.2
Leather and rubber products.....	88.2	-9.1	-5.2	70.1	-23.0	-13.5
Leather tanning.....	90.8	-18.5	-6.0	76.8	-27.1	-7.7
Shoes.....	95.3	+8.5	-5.3	67.4	-5.1	-20.3
Leather products, other.....	64.9	-18.0	-7.0	56.1	-35.5	-13.0
Rubber tires and goods.....	81.9	-1.2	+0.2	58.0	-24.5	-30.5
Paper and printing.....	92.0	-5.1	-0.1	84.8	-15.7	-2.4
Paper and wood pulp.....	78.1	-5.9	-1.5	62.8	-15.9	-1.3
Paper boxes and bags.....	88.9	-4.4	+1.7	85.9	-17.4	-3.4
Printing and publishing.....	97.8	-3.8	+0.4	93.5	-14.1	-2.9
Anthracite.....	81.2	-14.3	-3.8	62.3	-25.1	-19.4
Bituminous coal.....	.....	.....	+0.9	.....	.....	-2.0
Construction and contracting.....	.....	.....	-8.6	.....	.....	-8.8
Street railways.....	75.8	-5.4	-0.8	75.5	-10.8	-2.7
Retail trade.....	88.3	-14.4	-3.5	.....	.....	.....
Wholesale trade.....	89.3	-2.4	-1.9	.....	.....	.....

* 1923-1925 average = 100.

† Preliminary.

Synopsis of Industrial and Trade Conditions in the Philadelphia Federal Reserve District

	Demand	Operations	Stocks
Manufacturing			
Iron and steel			
Blast furnaces.....	Quiet	Declined	
Steel works and rolling mills	Slow	Declined	
Foundries and machine shops	Quiet	Daily output of iron and steel castings increased	
Electrical apparatus.....	Slow	Declined	
Transportation equipment			
Locomotives and cars.....	Quiet	Declined	
Shipbuilding	More active	Increased but not as much as usual	
Textiles			
Silk manufactures.....	Fair, some gain, prices lower	Declined	Increased
Wool dealers.....	Slow, prices lower		Declined
Wool manufactures.....	Slow, prices lower	Declined	Little change, smaller than a year ago
Cotton manufactures.....	Slow, declined, prices lower	Declined	Declined, smaller than a year ago
Hosiery	Fair, some gain	Declined	Smaller than a year ago
Floor coverings.....	Slow, declined, prices lower	Declined sharply	Some increase in November but smaller than a year ago
Leather products			
Shoes	Slow, unfilled orders smaller, prices lower	Declined	Little change, smaller than a year ago
Leather—sole	Quiet, little change	Little change	Increased
kid	Slow, little change, prices lower	Declined	Increased
goods	Quiet, some gain	Little change	Smaller than a year ago
Building materials			
Brick	Slow, unfilled orders smaller	Declined	Little change, smaller than a year ago
Cement	Slow, declined	Declined in December	Larger than a year ago
Lumber—mills	Slow, declined	Declined	Little change
Paints and varnishes.....	Slow, declined	Increased in November	Smaller than a year ago
Pottery	Slow, unfilled orders smaller	Little change	Little change
Slate	Slow, declined, prices lower	Little change	Little change
Miscellaneous			
Paper	Slow, prices lower	Little change	Little change
Tobacco—cigars	Quiet, unfilled orders smaller	Decline in November not as large as usual	Smaller than a year ago
leaf	Slow, declined	Declined	Smaller than a year ago
Confectionery	Quiet, some gain	Little change	Declined
Printing and publishing....	Quiet, little change	Declined	
Building			
	Contract awards declined sharply	Employment and payrolls declined in November	
Coal mining			
Anthracite	Little change in demand and prices	Declined in November but increased in early December	
Bituminous	Quiet	Daily output increased in November	
Trade			
Retail	Active, increased		Larger but below last year
Wholesale and jobbing....	Declined as usual		Declined, smaller than a year ago

A SUPPLEMENT TO THE BUSINESS REVIEW

JANUARY, 1932

Department of Research and Statistics
Federal Reserve Bank of Philadelphia

A Description of the Construction of an Index of Productive Activity in Manufacturing in the Philadelphia Federal Reserve District

In the discharge of its responsibility for the "proper adjustment of the supply of credit to the needs of industry and commerce," the Federal Reserve Bank of Philadelphia, like other reserve banks, must have continuous, prompt and dependable information on business conditions. Many business men—manufacturers, merchants, or bankers—realize the importance of having accurate measurements not only of the current activity in their own lines of business but also of the changes in trade and industry generally, in order to plan their budgets and operations in accordance with current developments. To meet the various needs for more adequate information, an index of productive activity in the manufacturing industry of this district has been constructed and is presented here.* It is shown on the accompanying chart (page 2) and in the tables at the end of this article. The index is based on the 1923-1925 average taken as 100, and is given both with and without adjustment for the usual seasonal changes.

The purpose of the new index is to measure changes in the rate and volume of output of manufactures, by far the most important industry in the district. It is especially useful in analyzing business developments, in combination with other data, such as those showing changes in employment and wage payments, volume of wholesale and retail trade, shipments of commodities, construction, and mining.

The index relates to manufacturing activity in the Philadelphia Federal Reserve District, which comprises 48 counties of eastern Pennsylvania, 9

* This index was planned and constructed under the direct supervision of Casimir A. Sienkiewicz, with the assistance of J. Frank Rehfuss, Helen M. Conine, and Rhea D. Johnson. Grateful acknowledgment is made to Arnyess Joy, Woodlief Thomas, and Donald Thompson of the Division of Research and Statistics of the Federal Reserve Board for their helpful suggestions and criticisms.

counties of southern New Jersey, and the State of Delaware. About 9 per cent of the total volume of manufacturing in the United States is done in this area. The economic importance of the district both in manufacturing and in other lines of industry is shown by Table I.

Industrially the district is highly diversified and, in order to obtain a fair cross section of manufacturing activity, it has been necessary to secure figures for some of the most important lines in each of the major groups. To that end, figures bearing on the productive activity of individual manufactures have been collected by months extending back to 1923; but until recently they have not been properly coordinated and so it has been extremely difficult to measure currently the central tendency among diverse changes of individual lines of manufacture. The new index provides such a measuring device.

The bulk of manufactures produced here consists of goods ready for final consumption, and to a lesser extent for use in further manufacture. Table II shows the diversity, character and importance of some of the individual commodities manufactured in this district as compared with the country as a whole.

Data used in the index and their characteristics

The index is made up of 45 series of figures covering most of the important industries in this district. The industries included in the index represent about two-thirds of the total output of manufactures in the district. Table III shows the comprehensive nature of the index and its industrial groups. The only important industries not represented are railroad repair shops, rubber tires and goods, glass and pottery, textile dyeing and

Table I

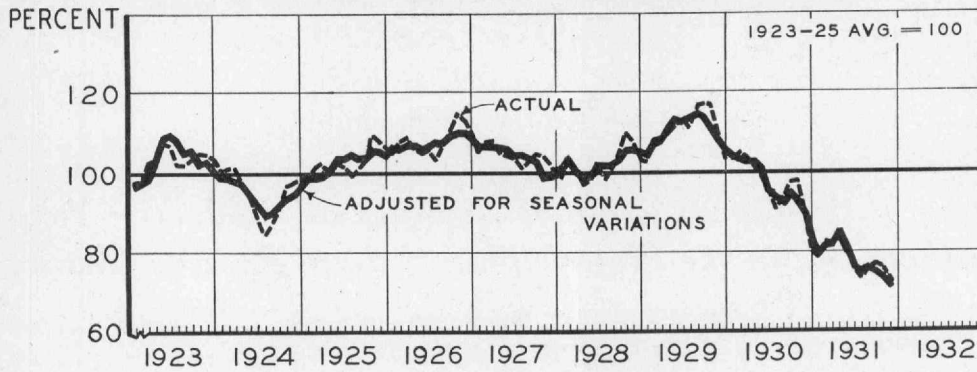
The economic importance of the Philadelphia Federal Reserve District	Per cent this district of United States
Land area and population	
Area—square miles.....	1.2
Population, total.....	6.2
Population, gainfully employed.....	6.2
Banking, etc.	
Resources of national and state banking institutions.....	7.6
Persons engaged in—	
Banking and brokerage.....	5.8
Insurance and real estate.....	5.7
Manufacturing	
Wage earners.....	9.5
Wages.....	9.2
Cost of materials.....	7.7
Value of products.....	8.1
Value added by manufacture.....	8.6
Extraction of minerals	
Anthracite coal—tons.....	100.0
Bituminous coal—tons.....	4.3
Persons engaged in—coal mines.....	27.7
Persons engaged in—others.....	4.2
Building	
Contracts awarded*.....	7.7
Persons engaged in building industry.....	7.5
Families (preliminary).....	6.3
Agriculture	
Farm population (rural and urban).....	2.2
Number of farms.....	2.2
Land area in farms.....	1.2
Value of land in farms.....	1.3
Value of farm buildings and implements.....	4.3
Cash income.....	2.6
Volume of trade	
Retail sales (60 cities).....	4.6
Wholesale sales.....	4.8
Automobile sales (registrations of new passenger cars).....	6.4
Persons engaged in retail and wholesale trades, except automobiles.....	6.5
Port of Philadelphia—foreign and domestic trade**.....	6.7
Transportation and communication	
Persons engaged in.....	6.6

* 37 states in the United States.
** 60 ports in the United States.

finishing and structural iron and steel. About 30 of the lines used in the index, with weights aggregating nearly two-thirds of the total, represent either actual output of products measured in physical units, such as number of pairs of shoes, tons of steel castings; consumption of raw materials, such as number of pounds of wool consumed by mills; or machinery activity. For the remaining industries, physical volume of production is measured indirectly by the use of monthly statistics

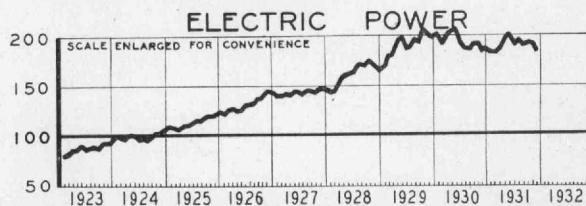
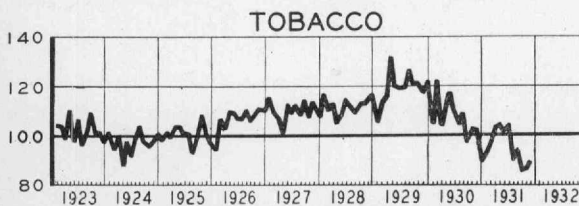
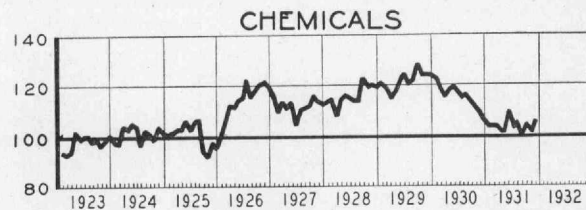
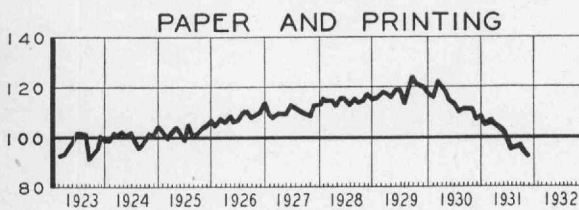
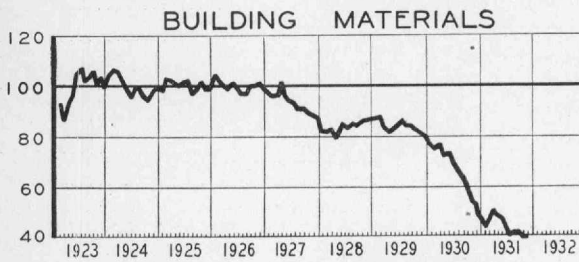
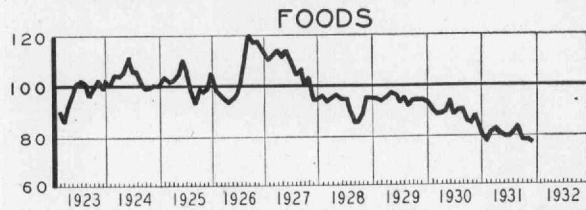
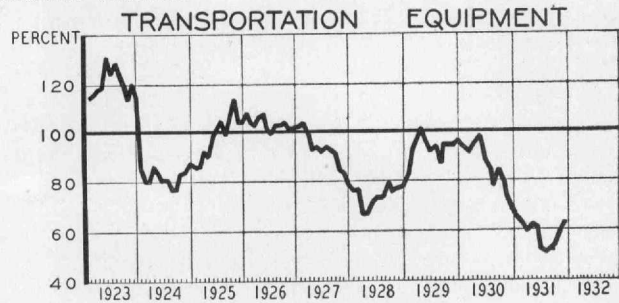
INDEX OF MANUFACTURING ACTIVITY

PHILADELPHIA FEDERAL RESERVE DISTRICT



GROUPS COMPOSING THE INDEX

ADJUSTED FOR SEASONAL VARIATIONS



of wage payments in the district, adjusted either annually or biennially to conform with figures of the actual physical volume of production.

The use of data on wage payments as a measure of productive activity is a novel feature of the index and makes possible the representation of a number of important industries such as transportation equipment, printing and publishing, and certain food lines, without which a measure of manufacturing in the Philadelphia district would be incomplete.

The general trend of payrolls in the district corresponds closely with the trend of manufactures as indicated by value added by manufacture reported in the census. For individual industries, however, total wage payments do not always fluctuate in the same way as volume of production because of the introduction of economies in operation; accordingly statistics of wage payments in each industry have been adjusted to the appropriate level as shown by production figures. In some industries, such as railroad locomotives and shipbuilding, monthly payrolls are probably a better measure of output than the number of units completed, since several months are ordinarily required for completion of these units. In a num-

Table II

Some of the principal manufactures of the Philadelphia Federal Reserve District	Output—per cent of United States
Hosiery	41.6
Silk goods	41.5
Knit goods	29.7
Explosives	27.0
Cement	24.5
Carpets and rugs	24.1
Locomotives and cars	23.9
Leather—tanned, curried, and finished	23.9
Shipbuilding	19.3
Canning	15.8
Sugar refining	15.7
Steel works and rolling mills	15.6
Electrical machinery	13.8
Structural iron and steel	13.6
Ice cream	13.5
Cigars	12.4
Dyeing and finishing textiles	12.3
Railroad repair shops	11.6
Woolens and worsteds	11.3
Paints and varnishes	9.4
Bread and bakery products	9.3
Confectionery	9.3
Men's clothing	9.1
Petroleum refining	8.3
Glass	8.2
Printing and publishing	7.8
Paper and wood pulp	7.5
Blast furnaces	7.2
Cotton goods	6.9
Planing mills	6.8
Aircraft	6.1
Furniture	5.6
Foundries and machine shops	5.9
Boots and shoes	4.9
Slaughtering	4.8
Automobile bodies and parts	4.4
Women's clothing	4.0

ber of the other industries, payrolls are probably not quite as satisfactory a measure of the physical volume of production as total monthly output for the reason that payroll figures generally relate to the pay period ending nearest the 15th of the month rather than to the month as a whole, resulting in some differences in seasonal fluctuations. Each of these series has been carefully tested, and after adjustment to production statistics, is believed to represent the output of the industry reasonably well.

Most of the data pertain directly to the area covered by the Philadelphia Federal Reserve District. In several instances, however, it was not possible to secure satisfactory figures for the district but only those covering a larger geographic area. In such cases only those series were used which showed that at least three-fourths of the total output was produced in this district and that the current reports from local manufacturers were well represented in the figures.

Daily averages and adjustments to census changes

Figures of output as originally reported in most cases are on a monthly basis, taking no account of the difference in the number of working days from one month to another as well as from one year to another. In order to make these figures truly comparable, they have been reduced to daily averages for all the series, except those representing machinery activity and those which have been derived from wage payments. In the latter, however, special adjustments have been made in the case of the periods which include a holiday in one year and do not in other years. The number of working days each year has been determined separately for each line of manufacture.

After selecting the necessary data and making preliminary adjustments, figures for each line were then expressed in percentages, or relatives, as they are technically called, of the monthly average of the three years, 1923, 1924 and 1925.

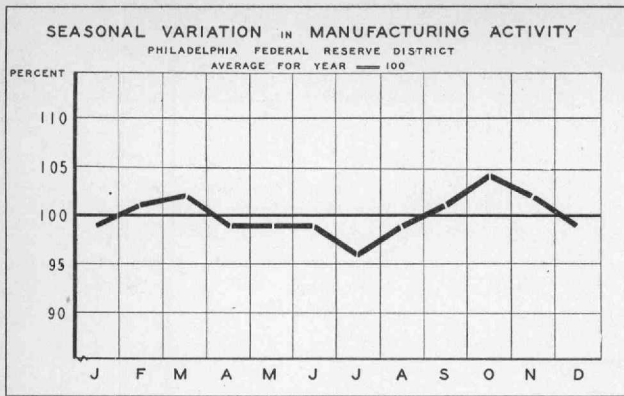
Annual figures for each industry were next compared with the trend as shown by the census of manufactures and whenever necessary were adjusted to the level of change indicated by the census, which at present is the most complete record available. The necessity for this adjustment arises from

Table III

Adequacy of data used in the index* Group and industry	Per cent of total output represented by index	
	Groups	Industries
All manufacturing industries	65.7	
Metals	57.1	
Electrical apparatus		88.3
Iron castings		20.5
Steel castings		16.0
Pig iron		94.8
Steel		50.1
Textiles	72.9	
Silk manufactures		77.1
Hosiery		60.5
Cotton manufactures		20.6
Active cotton spindle hours		100.0
Men's clothing cut		66.8
Wool takings		94.6
Active wool machinery		91.7
Carpets and rugs		85.8
Knit underwear		47.9
Transportation equipment	50.6	
Locomotives and cars		89.4
Motor vehicle bodies and parts		91.2
Motor vehicles		64.0
Shipbuilding		92.1
Foods	81.2	
Bread and bakery products		30.5
Canning and preserving		68.8
Ice cream		43.9
Swine slaughtered		54.6
Cattle slaughtered		52.0
Calves slaughtered		50.1
Sheep slaughtered		40.0
Sugar refining		100.0
Tobacco	87.7	
Cigars		100.0
Tobacco and snuff		100.0
Building materials	63.7	
Lumber and planing mills		99.0
Brick		31.0
Portland cement		100.0
Leather	60.4	
Goat and kid leather		100.0
Boots and shoes		94.1
Paper and printing	80.8	
Printing and publishing		20.4
Paper and wood pulp		33.8
Chemicals	37.1	
Paints and varnishes		29.9
Explosives		100.0
Coke		100.0
Gasoline		100.0
Gas and fuel oil		100.0
Lubricants		100.0
Kerosene		100.0
Asphalt		100.0
Radio and musical instruments	100.0	100.0

* Based on Census of Manufactures, 1927.

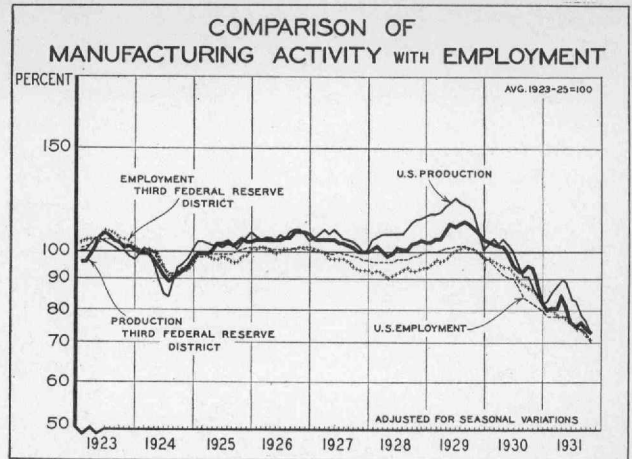
the fact that many of the figures used in the index do not cover the entire industry, but only a limited number of manufacturers who are believed to be representative of each line. Statistical measurements of commercial and industrial activity derived from sample data, not from figures covering the entire industry or trade such as a monthly census would furnish, are subject to some bias in view of the fact that they do not reflect all of the changes in the activity or composition of the industry. The record provided by the biennial censuses affords a means for removing this bias so that the figures for each line show the same trend as does the census. This adjustment affects only the yearly figures and does not disturb the current monthly changes as given by the index.



Adjustment for seasonal variation

All but four industries represented in the index show marked seasonal, or month-to-month fluctuations, such as recession in midsummer and midwinter and expansion in spring and autumn months. These fluctuations reflect an uneven distribution of production through the year and render the analysis of current changes extremely difficult. For example, for the entire manufacturing industry the extreme points deviate from the monthly average of 100 in this manner: 102 for March, 96 for July, 104 for October and 99 for January and December. Variations in most individual lines are much more pronounced. Obviously, it is necessary to make some adjustment for these swings in order to show currently whether there is any improvement or decline in each industry beyond the usual seasonal changes.

There are several methods for removing the influence of these seasonal ups and downs, but the one used in the present index is known technically as the median-ratio-to-moving-average method; it has been used by the Federal Reserve Board for some years and found quite satisfactory for practical purposes. A set of twelve seasonal indexes, one for each month in the year, was computed for each industry. These indexes measure the output in each month in relation to the average for a typical year and resemble those shown on the chart for manufacturing as a whole. In industries in which there was clear evidence that the character of the seasonal movements was changing, some months gaining, others losing over a period of years, a separate set of monthly indexes was derived for each year. In computing these measures of seasonal variations, allowance was made for unusual circumstances in the industry, such as labor stoppages, and



for the general trend of production over a period of years.

Once these factors are computed, the removal of seasonal influences is quite simple. For example, the actual index of hosiery output for October 1931, was 113.7 per cent of the 1923-25 average, while the typical seasonal factor for that month is 110.0; dividing the former by the latter, a new index, 103.4, which is free from seasonal effects, is obtained. The procedure has been followed in all individual lines, except those which showed no conclusive evidence of the presence of normal seasonal variations.

The total index and the group indexes are available in two forms, the one without adjustment for seasonal variation, the other with such adjustment. They are given in tables at the end of this description.

Importance and combination of individual figures

After all necessary adjustments were completed, the indexes for individual industries were combined into composite indexes for groups, and then into the final index for manufacturing as a whole. This combination has been effected by the use of weights, or percentages, showing the relative importance of one industry to another and in relation to all lines included in the index. These weights have been derived from figures for value added by the process of manufacture in the industries represented, as reported in the biennial censuses of 1923 and 1925. In order to make the weights apply more precisely to the three-year base period, value added by manufacture for the two census years in most cases was adjusted for 1924, a year for which there was no census of manufactures.

The proportionate importance of industries which are represented in

the index is shown by Table IV, which follows, together with the sources of the data for each industry.

The application of the index

The critical use of the index for over a year has demonstrated its effectiveness in measuring monthly changes in the manufacturing activity of this district. The likeness of fluctuation between the index and some of the related data, shown on the chart given above, is quite pronounced. Even in the case of factory employment, which has undergone many changes since the war, the relationship is apparent, though the trend varies from that of manufacturing output. Prior to 1925 the index of factory employment followed very closely the trend of production, but since that time it has noticeably dropped below production. The fact that this spread has narrowed down in 1930 and 1931 is due mainly to a more pronounced curtailment of output than of employment, which is characteristic of depression periods.

The figures in the following table show differences in the trend of factory production, employment and payrolls for the United States as a whole.

Census year	Volume of output	Employment	Payrolls
1914.....	79.3	76.6	38.9
1919.....	100.0	100.0	100.0
1921.....	79.4	77.2	78.4
1923.....	122.0	97.5	105.2
1925.....	127.9	93.1	102.6
1927.....	128.6	92.8	103.7
1929.....	144.3*	97.9	111.4

* Preliminary.

The fact that employment has actually declined since 1919 is rather unusual in view of the remarkable expansion during this period of such enterprises as the motor, electrical, aircraft and rayon industries, the pro-

Table IV
DATA USED IN THE INDEX
MANUFACTURING INDUSTRIES—PHILADELPHIA FEDERAL RESERVE DISTRICT

Industry and group	Series	Relative importance (per cent)	Source
Manufacturing industries (combined)		100.00	
Iron and steel and their products:		21.26	
Crude iron and steel and rolled products		13.31	
Blast furnaces	Pig iron production	0.86	Iron Age
Steel works and rolling mills	Output of steel and products	12.45	American Iron and Steel Institute Philadelphia Federal Reserve Bank
Secondary metal products:		7.95	
Foundries and machine shops		1.64	
	Iron castings production	1.04	University of Pennsylvania, Dept. of Industrial Research
	Steel castings production	0.60	
Electrical machinery and apparatus	Payrolls	6.31	Philadelphia Federal Reserve Bank
Textiles and their products:		26.00	
Silk manufactures	Machinery activity	7.78	Silk Association of America
Woolen goods		5.71	
Woolen and worsted goods		3.68	
	Wool consumption	2.23	Bureau of the Census, Department of Commerce
Carpets and rugs	Machinery activity	1.45	Department of Commerce
	Machinery activity	2.03	Bureau of the Census, Department of Commerce
Cotton goods—incl. small wares		3.85	
	Payrolls	3.32	Philadelphia Federal Reserve Bank
	Active spindle hours	0.53	Bureau of the Census, Department of Commerce
Knit goods		5.65	
Hosiery	Production	4.89	Bureau of the Census, Department of Commerce
Underwear	Production	0.76	Bureau of the Census, Department of Commerce
Men's clothing	Pieces cut in Philadelphia	3.01	Bureau of the Census, Department of Commerce
Transportation equipment:		7.91	
Motor vehicles	Payrolls	1.53	Philadelphia Federal Reserve Bank
Motor vehicles—bodies & parts	Payrolls	1.92	Philadelphia Federal Reserve Bank
Locomotives and cars	Payrolls	2.93	Philadelphia Federal Reserve Bank
Ship and boat building	Payrolls	1.53	Philadelphia Federal Reserve Bank N. J. Department of Labor
Building materials:		10.98	
Cement	Portland cement production	3.06	Bureau of Mines, Dept. of Commerce
Brick	Production	2.79	Census of Manufactures Philadelphia Federal Reserve Bank
Lumber and its products	Production	5.13	Census of Manufactures Philadelphia Federal Reserve Bank
Food and allied products:		9.46	
Bread and bakery products	Payrolls	3.69	Philadelphia Federal Reserve Bank
Ice cream	Payrolls	1.48	Philadelphia Federal Reserve Bank
Meat packing		1.51	
Animals slaughtered		0.32	
	Cattle	0.06	Department of Agriculture, Bureau of Animal Industry
	Calves	0.05	
	Sheep	0.08	
	Swine	1.08	
Sugar refining	Receipts at Philadelphia	0.46	Weekly Statistical Sugar Trade Jour.
Canning and preserving	Payrolls	2.32	New Jersey Department of Labor
Tobacco manufactures:		3.86	
	Chewing and snuff	0.09	Internal Revenue, Treasury Dept.
	Cigars	3.77	Internal Revenue, Treasury Dept.
Leather and its products:		3.12	
Boots and shoes	Production	1.52	Bureau of the Census
Leather, tanned, curried and finished	Goat and kid leather production	1.60	
Paper and printing:		10.29	
Paper and wood pulp	Production	1.73	Census of Manufactures Philadelphia Federal Reserve Bank Philadelphia Federal Reserve Bank
Printing and publishing	Payrolls	8.56	
Chemicals and allied products:		4.03	
Explosives	Production	0.60	Bureau of Mines, Dept. of Commerce
Paints and varnishes	Payrolls	1.12	Philadelphia Federal Reserve Bank
Petroleum refining	Production:	1.79	
	Gasoline	0.87	Bureau of Mines, Dept. of Commerce
	Kerosene	0.19	Bureau of Mines, Dept. of Commerce
	Gas and fuel oil	0.38	Bureau of Mines, Dept. of Commerce
	Lubricants	0.29	Bureau of Mines, Dept. of Commerce
	Asphalt	0.06	Bureau of Mines, Dept. of Commerce
Coke by-product	Production	0.52	Bureau of Mines, Dept. of Commerce
Radio and musical instruments:		2.09	
Payrolls		2.09	Philadelphia Federal Reserve Bank
Electric power:		1.00	
	Production	1.00	Philadelphia Federal Reserve Bank

expected since they usually indicate changes in the rate of operations.

The chart also gives comparisons of factory productive activity in this district with the production index of the Federal Reserve Board which is representative of manufacturing activity in the country. It is evident that there exists a striking similarity, certainly in major swings, between the two indexes and the degree of this correspondence is quite high. Changes in the national index in many instances precede those in the local index, owing probably to differences in the various stages and types of manufactures which compose each index. Variation in the two indexes indicates the importance of regional studies of productive activity, which supplement national indexes, furnishing more specific information concerning business conditions and requirements for bank credit in various districts.

Comparison of the manufacturing activity index with freight car loadings of merchandise (less-than-car-load) and miscellaneous commodities combined in the Allegheny shipping area disclose an exceedingly high degree of likeness in their trends over a period of years as well as in monthly fluctuations, even though figures for shipments cover a much larger area than do those for production. Changes in productive activity seem to occur somewhat later than changes in the shipment of commodities, owing probably to the incoming volume of those commodities which are used for further manufacture. The closeness of this relationship is all the more striking in view of the rapid developments during recent years in the transportation of goods by truck, satisfactory figures for which are not yet available. Commodities, especially those in earlier stages of manufacture, continue to be carried by railroad freight, certainly in the case of long distances, and thus changes in this movement furnish a valuable supplement to the study of productive activity.

Careful tests and comparisons with other indicators, therefore, show that the index of productive activity in the manufacturing industry of this district provides a useful measurement for both specific and general purposes. It brings together isolated figures for many individual lines for the first time, and suggests a further need for like studies by geographical divisions in order to measure more effectively diverse changes and trends in various parts of the country.

gressive shortening of working hours, and of the increase in population. The causes of this disparity in the trend of factory production and employment may be attributed in large measure to the invention and installation of new

machinery, scientific management, increased efficiency of workers, and probably economies effected through mergers. Fluctuations in payrolls agree more closely than employment with actual production, as is to be

Index of Productive Activity in Manufacturing in the Philadelphia Federal Reserve District

1923-25 average = 100
ALL MANUFACTURING

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	96.1	100.1	98.6	104.6	104.7	98.5	102.2	102.6	78.1	Jan.	96.2	99.8	98.9	105.7	106.4	100.4	104.4	104.8	79.5	
Feb. . .	97.5	101.1	101.0	107.6	107.5	103.5	107.9	104.3	81.9	Feb.	95.4	99.1	98.9	105.7	106.1	102.4	106.9	103.5	81.1	
Mar. . .	102.2	101.3	101.8	108.6	107.5	100.5	108.4	103.5	81.8	Mar.	99.1	98.9	99.2	106.4	106.2	99.7	107.3	102.7	81.2	
Apr. . .	103.0	97.4	100.4	105.9	104.5	96.7	109.0	101.1	83.1	Apr.	102.5	97.1	100.1	106.2	105.9	98.2	110.9	102.8	85.1	
May. . .	107.0	93.8	102.6	104.8	103.9	98.0	111.5	99.1	79.8	May	108.2	94.8	103.7	105.9	105.6	99.2	113.3	100.2	80.8	
June. . .	106.6	88.9	101.5	105.1	103.1	101.1	112.9	95.2	75.8	June	109.5	91.2	103.7	106.5	104.3	101.5	113.0	95.0	75.7	
July. . .	101.5	84.5	99.8	102.8	100.6	97.9	110.4	90.6	73.1	July	107.5	89.1	105.1	107.4	104.4	101.2	113.8	93.1	75.2	
Aug. . .	101.4	87.5	100.8	106.3	102.9	101.2	116.0	93.4	75.8	Aug.	104.3	89.7	103.4	107.3	103.2	101.0	114.8	92.3	75.8	
Sept. . .	103.4	91.4	103.2	110.6	104.5	105.4	116.8	97.5	76.5	Sept.	104.8	92.2	103.9	109.8	102.5	103.6	114.3	95.2	74.7	
Oct. . .	104.7	96.6	109.5	114.5	103.8	109.1	116.3	97.8	75.8	Oct.	101.5	93.2	105.8	109.9	99.6	105.0	111.7	93.4	72.9	
Nov. . .	104.4	96.2	107.2	112.1	101.9	107.2	110.0	90.6	72.3p	Nov.	102.8	94.1	105.4	110.1	99.9	105.5	108.4	88.8	71.0p	
Dec. . .	102.9	98.5	105.9	109.0	98.9	102.3	102.8	80.0		Dec.	101.0	96.9	104.9	108.7	99.8	104.5	105.5	81.9		
Avg. . .	102.6	94.8	102.7	107.7	103.7	101.8	110.4	96.3												

p—preliminary

METALS

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	90.2	103.3	104.7	113.9	107.2	93.6	113.2	117.1	74.2	Jan.	88.1	101.2	102.9	113.6	108.2	95.9	117.2	121.4	77.0	
Feb. . .	93.1	106.7	106.1	119.4	111.2	108.0	119.4	117.7	72.9	Feb.	89.6	102.8	102.4	115.5	107.9	105.5	117.1	115.9	71.8	
Mar. . .	99.4	106.8	105.2	121.2	111.5	106.9	119.3	115.5	71.8	Mar.	93.9	101.2	99.7	115.6	107.2	103.4	116.4	113.1	70.3	
Apr. . .	98.3	104.0	102.9	118.2	108.6	102.0	121.6	114.7	76.6	Apr.	92.9	98.4	98.2	114.5	107.4	101.8	123.1	117.1	78.3	
May. . .	108.9	95.2	101.8	114.7	104.2	105.0	127.3	111.7	68.2	May	107.8	94.4	101.7	115.6	104.5	104.3	127.0	112.0	68.5	
June. . .	108.2	82.5	100.8	116.4	104.7	103.7	127.8	103.8	61.2	June	113.2	86.1	104.8	118.8	106.4	104.4	128.6	102.8	60.7	
July. . .	97.7	71.7	94.9	108.2	95.0	98.3	125.8	94.7	57.0	July	110.5	81.0	106.8	119.6	103.0	104.9	131.0	98.5	59.1	
Aug. . .	104.9	78.5	98.9	113.4	101.1	111.5	137.6	97.8	57.5	Aug.	112.0	83.8	104.3	117.0	101.6	109.5	131.7	93.2	54.6	
Sept. . .	106.4	83.4	101.4	118.4	98.5	111.6	129.0	97.4	53.6	Sept.	113.7	89.3	107.4	123.1	100.4	111.6	128.4	96.5	52.8	
Oct. . .	109.7	88.5	112.2	125.4	97.2	119.5	127.2	92.5	51.3	Oct.	107.4	86.2	109.2	122.1	94.3	116.0	123.3	89.4	49.2	
Nov. . .	109.4	88.6	112.6	120.7	95.7	116.9	122.3	83.8	46.4	Nov.	108.1	87.2	111.4	120.0	95.1	116.7	122.3	83.6	46.2	
Dec. . .	108.2	99.5	116.1	119.9	95.2	112.4	112.5	73.5		Dec.	101.5	93.3	109.6	115.2	94.0	115.3	118.0	77.2		
Avg. . .	102.9	92.4	104.8	117.5	102.5	107.5	123.6	101.7												

TEXTILES

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	105.2	106.1	102.7	108.5	105.0	105.4	105.0	102.2	80.1	Jan.	100.1	100.2	98.0	104.5	101.2	101.7	101.0	98.6	77.1	
Feb. . .	105.1	102.3	106.5	109.0	109.9	111.7	111.0	104.3	89.3	Feb.	98.0	95.2	98.9	101.4	101.8	103.5	102.6	96.6	82.3	
Mar. . .	107.1	100.7	107.4	108.6	106.7	102.6	110.7	100.4	86.9	Mar.	100.9	94.8	101.8	103.5	102.0	98.3	106.3	96.6	83.2	
Apr. . .	106.1	91.5	103.2	99.1	98.5	91.5	103.9	86.6	85.6	Apr.	106.9	92.5	105.0	101.6	101.6	95.1	108.1	93.3	90.1	
May. . .	106.3	84.9	109.0	96.6	100.0	91.4	106.0	82.4	81.9	May	108.4	86.3	111.5	99.1	103.0	94.6	109.8	85.8	83.7	
June. . .	104.0	81.7	106.5	97.6	97.3	96.9	108.0	82.0	79.3	June	108.0	84.5	110.7	100.9	99.8	99.0	110.0	83.8	80.6	
July. . .	98.8	75.3	104.9	94.1	98.3	92.9	101.2	75.7	77.8	July	107.0	81.7	113.1	100.1	103.9	98.4	107.7	80.5	82.7	
Aug. . .	93.9	78.3	105.8	94.3	97.2	90.6	104.0	75.4	83.1	Aug.	101.7	85.0	113.7	100.4	102.9	95.5	109.5	79.6	87.4	
Sept. . .	95.3	87.3	106.4	100.2	101.3	99.6	109.1	84.6	88.0	Sept.	99.8	90.7	109.1	101.6	102.0	99.5	108.6	84.0	87.3	
Oct. . .	99.7	98.3	111.4	102.6	101.7	104.3	108.9	89.2	86.4	Oct.	96.6	94.9	108.8	100.6	99.8	102.5	106.4	87.0	84.4	
Nov. . .	97.9	96.1	110.0	103.1	103.5	102.8	105.2	90.5	81.6	Nov.	96.4	93.9	108.3	101.5	101.4	101.0	102.6	88.1	79.7	
Dec. . .	98.6	98.6	106.9	103.5	102.2	100.5	97.0	80.6		Dec.	96.9	96.6	105.0	102.2	101.7	100.7	97.2	80.8		
Avg. . .	101.5	91.8	106.7	101.4	101.8	99.2	105.8	88.1												

TRANSPORTATION EQUIPMENT

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	112.0	84.3	84.6	105.3	100.3	74.6	80.4	91.9	62.8	Jan.	114.2	85.8	86.4	107.2	102.0	75.8	82.0	93.5	64.5	
Feb. . .	117.8	82.5	88.2	106.3	105.0	77.5	95.6	92.8	63.4	Feb.	114.7	80.4	85.8	103.5	103.5	75.7	93.0	91.5	63.1	
Mar. . .	126.0	85.9	97.4	110.1	105.2	72.0	103.6	101.8	62.8	Mar.	117.3	80.3	90.8	102.8	98.6	67.2	96.5	95.4	59.1	
Apr. . .	126.9	90.6	97.3	114.5	99.8	72.0	109.5	104.8	66.5	Apr.	118.2	84.5	89.9	106.2	93.2	66.8	101.3	97.3	61.9	
May. . .	134.5	85.8	102.9	111.7	97.8	74.0	100.6	102.7	61.6	May	131.4	82.8	98.4	107.0	93.5	70.6	95.8	97.6	60.7	
June. . .	127.1	82.3	104.1	104.3	94.8	75.2	94.8	91.6	53.8	June	123.6	79.9	100.7	100.5	91.9	72.9	92.1	89.1	52.5	
July. . .	126.2	78.7	100.8	97.0	91.6	71.0	91.9	83.0	49.7	July	128.2	80.4	103.5	99.1	93.6	72.5	93.6	84.7	50.8	
Aug. . .	123.3	74.4	94.4	98.4	90.0	70.6	85.1	76.2	50.1	Aug.	125.4	76.7	98.6	102.0	92.6	73.6	88.2	78.2	51.9	
Sept. . .	114.4	73.3	99.9	96.2	86.8	72.1	89.1	79.1	51.1	Sept.	119.9	77.1	105.6	101.5	91.8	78.7	94.5	83.9	54.4	
Oct. . .	107.6	78.5	106.7	98.0	80.8	71.5	90.0	75.8	56.4	Oct.	113.7	83.0	112.8	103.2	85.4	75.5	94.8	79.6	59.2	
Nov. . .	112.5	79.6	97.9	95.4	79.9	72.3	90.5	70.4	60.1	Nov.	119.6	84.4	103.7	100.7	84.4	76.8	95.4	73.1	62.9	
Dec. . .	113.4	85.1	102.8	100.3	78.6	76.7	95.9	68.2		Dec.	114.5	86.6	104.1	100.8	79.2	78.1	96.3	68.3		
Avg. . .	120.1	81.8	98.1	103.1	92.6	73.3	93.9	86.5												

FOODS

	Without seasonal adjustment									Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	85.7	98.0	100.2	95.1	107.5	93.3	91.9	87.7	76.9	Jan.	89.7	99.8	103.0	98.3	110.7	96.4	94.6	89.9	78.1
Feb. . .	84.3	102.0	99.8	94.1	108.9	92.4	92.2	87.0	81.0	Feb.	86.3	103.8	102.2	96.5	111.8	94.2	93.6	88.9	81.2
Mar. . .	90.7	100.9	99.4	93.6	111.5	93.7	94.9	87.8	81.7	Mar.	92.5	103.9	102.0	95.3	114.4	95.4	95.0	89.0	82.2
Apr. . .	93.7	100.9	99.8	91.1	107.4	94.8	95.0	89.1	79.4	Apr.	97.1	105.2	103.8	93.6	112.0	96.2	96.8	90.1	80.5
May . .	95.2	104.3	102.4	93.0	108.7	92.8	93.7	94.3	79.9	May	101.0	109.5	108.6	94.9	113.9	94.8	95.7	94.2	80.3
June . .	96.0	98.2	100.3	93.8	104.2	92.2	90.6	86.4	81.1	June	102.3	105.1	105.7	96.8	110.1	94.9	93.2	87.8	80.0
July . .	97.7	101.3	97.0	101.0	100.9	88.5	93.4	89.0	80.8	July	100.2	104.9	99.1	101.9	104.4	90.2	94.9	89.9	81.3
Aug. . .	100.0	104.6	99.6	112.3	112.2	87.9	95.2	91.9	83.9	Aug.	96.2	100.8	93.5	111.4	105.2	86.0	92.3	89.5	83.6
Sept. .	107.5	107.9	108.3	135.5	112.7	90.2	99.8	90.9	80.8	Sept.	98.5	98.8	98.6	119.6	100.2	85.8	94.2	86.4	77.8
Oct. . .	109.3	107.2	106.6	131.8	113.9	91.8	99.3	89.1	80.8	Oct.	102.2	99.3	98.0	117.2	102.7	88.2	94.3	85.2	78.4
Nov. . .	100.0	101.6	100.4	117.0	95.6	93.4	93.5	83.9	76.3p	Nov.	98.6	100.0	99.3	116.9	95.3	95.3	93.9	87.1	76.6p
Dec. . .	100.8	98.3	100.1	111.6	92.5	92.1	91.5	79.6		Dec.	101.5	99.5	104.1	114.3	94.6	95.0	93.0	81.4	
Avg. . .	96.7	102.1	101.2	105.8	106.3	91.9	94.3	88.1											

TOBACCO

	Without seasonal adjustment									Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	96.1	91.8	84.8	80.7	96.1	96.5	87.2	87.0	76.7	Jan.	104.1	100.5	98.1	94.5	115.3	117.0	105.7	105.3	92.7
Feb. . .	91.7	84.2	90.4	95.9	98.3	96.5	96.8	102.9	82.9	Feb.	102.6	95.2	101.1	106.2	108.9	110.6	113.4	122.0	98.2
Mar. . .	94.1	93.6	94.4	96.5	98.8	103.5	107.3	96.1	95.2	Mar.	100.0	99.5	100.3	103.5	107.1	112.2	116.3	104.2	103.2
Apr. . .	99.9	80.4	94.4	100.2	92.0	96.5	118.8	101.9	94.8	Apr.	109.7	88.2	103.5	110.0	101.0	105.9	130.5	111.8	104.0
May . .	96.1	93.8	100.7	106.9	109.5	105.6	116.4	113.2	98.6	May	98.9	96.6	102.7	109.0	112.8	108.8	119.9	116.5	101.5
June . .	110.0	95.6	106.2	112.7	115.5	121.0	125.8	117.0	110.0	June	105.8	91.9	101.1	107.3	110.0	114.1	118.6	110.4	103.8
July . .	99.9	102.8	106.2	114.8	122.8	123.3	131.7	114.8	98.2	July	97.1	98.9	100.3	106.5	111.9	112.3	120.0	104.7	89.7
Aug. . .	103.4	105.3	96.6	112.7	110.9	113.7	131.3	113.6	97.8	Aug.	101.3	103.1	94.7	110.4	108.6	110.4	126.2	109.3	94.1
Sept. .	119.9	107.6	110.8	117.6	133.6	131.9	141.2	114.0	100.1	Sept.	108.1	96.9	99.8	106.0	114.4	113.1	121.0	97.7	85.9
Oct. . .	114.6	109.6	126.5	127.6	130.7	138.4	149.7	127.2	103.3	Oct.	100.8	95.6	107.5	107.6	108.4	112.9	121.2	102.3	87.2
Nov. . .	112.1	109.3	115.2	130.1	133.3	136.7	139.4	120.3	105.4	Nov.	100.6	97.9	100.6	109.8	112.5	115.4	117.7	101.6	89.1
Dec. . .	89.1	91.3	82.6	87.6	78.9	84.6	89.5	66.0		Dec.	98.1	100.5	97.2	110.8	107.8	115.5	122.1	89.9	
Avg. . .	102.2	97.1	100.7	106.9	110.0	112.4	119.6	106.2											

BUILDING MATERIALS

	Without seasonal adjustment									Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	82.0	92.9	88.4	91.0	83.7	69.6	74.0	65.0	36.5	Jan.	92.4	104.1	99.1	103.7	97.2	82.2	87.1	76.9	44.1
Feb. . .	83.2	101.0	97.0	92.8	85.9	71.6	75.6	65.9	40.4	Feb.	87.1	106.1	102.6	100.9	96.2	81.6	86.6	75.9	47.9
Mar. . .	91.2	101.8	97.2	94.3	89.1	74.6	75.0	68.6	43.0	Mar.	93.6	104.5	101.5	100.0	96.6	82.7	83.4	77.1	49.6
Apr. . .	95.8	100.4	99.7	97.5	100.1	78.9	81.3	72.8	47.7	Apr.	97.1	101.7	101.0	98.7	101.2	79.9	82.3	73.3	47.8
May . .	104.3	98.7	99.7	101.8	96.8	85.0	85.3	77.3	49.8	May	104.7	98.6	99.8	101.1	95.5	82.7	83.1	74.4	46.9
June . .	109.1	98.0	104.0	103.6	100.1	92.0	92.3	75.4	47.7	June	106.9	95.8	101.4	99.0	93.6	84.6	85.4	69.2	42.9
July . .	105.2	103.1	107.7	103.3	99.1	90.3	92.2	71.8	44.1	July	101.9	98.8	101.8	97.4	92.6	83.5	85.5	65.6	40.3
Aug. . .	111.0	106.2	103.2	103.4	99.0	94.7	94.7	72.3	47.5	Aug.	104.4	99.4	97.3	97.0	90.9	85.2	84.2	63.6	41.3
Sept. .	107.8	99.7	103.0	104.8	98.0	91.1	90.4	65.5	44.7	Sept.	104.7	96.3	99.3	99.8	91.0	84.6	84.0	60.2	40.6
Oct. . .	104.8	98.8	106.5	106.2	94.1	91.2	87.2	57.7	42.1	Oct.	101.1	94.8	101.1	100.2	88.7	85.7	82.1	54.4	39.4
Nov. . .	105.6	101.3	101.2	103.2	90.3	86.2	80.9	52.2	38.4	Nov.	102.9	98.4	98.8	100.6	88.4	85.8	81.0	52.6	38.7
Dec. . .	98.2	96.3	96.2	93.3	82.0	81.6	71.3	42.7		Dec.	100.4	99.4	100.0	97.8	87.2	87.2	76.9	47.0	
Avg. . .	99.9	99.9	100.3	99.6	93.2	83.9	83.4	65.6											

LEATHER PRODUCTS

	Without seasonal adjustment									Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	120.7	89.5	94.0	116.7	121.3	129.4	117.4	128.6	104.2	Jan.	119.1	87.6	90.3	110.9	115.2	124.3	112.8	123.5	100.1
Feb. . .	128.4	91.5	104.8	126.4	125.7	129.8	128.8	134.4	122.7	Feb.	117.9	83.2	95.3	115.2	115.5	121.2	120.8	126.0	115.2
Mar. . .	133.8	93.5	104.8	125.0	117.8	126.1	123.6	137.3	132.8	Mar.	121.1	84.6	94.8	115.4	111.8	122.9	120.9	134.6	129.6
Apr. . .	123.9	85.7	97.8	117.2	112.0	121.0	118.9	127.8	131.2	Apr.	120.4	83.6	96.8	117.3	113.8	123.1	120.9	129.9	133.1
May . .	123.4	82.6	101.4	111.0	108.4	112.1	114.2	118.2	120.1	May	121.7	81.2	99.9	111.5	115.9	122.4	125.5	129.9	132.0
June . .	120.8	72.1	89.8	101.2	114.1	123.3	127.3	117.5	110.3	June	131.8	78.3	97.5	107.2	118.8	125.6	129.4	119.3	112.4
July . .	108.0	63.9	82.6	95.1	104.0	112.7	121.5	112.3	111.8	July	128.5	76.6	99.0	113.0	119.0	127.2	134.6	124.6	123.9
Aug. . .	111.6	74.1	99.4	108.9	122.5	122.8	128.8	124.4	126.4	Aug.	117.6	77.7	104.7	111.9	121.6	121.8	127.3	123.4	125.1
Sept. .	112.6	84.7	103.0	111.8	126.9	133.9	137.0	133.6	129.2	Sept.	112.9	84.6	103.0	110.8	121.2	124.6	126.5	123.2	119.0
Oct. . .	107.8	92.4	106.7	113.2	128.3	126.6	148.5	123.0	108.1	Oct.	104.7	89.7	104.0	110.1	122.4	119.6	140.1	116.4	102.1
Nov. . .	102.2	86.8	102.6	108.4	115.3	112.6	131.9	105.5	98.2p	Nov.	104.2	88.1	105.8	112.8	120.7	117.8	137.9	110.2	102.7p
Dec. . .	102.4	89.8	111.2	113.6	121.9	113.9	133.2	98.6		Dec.	99.7	87.8	108.7	112.2	122.4	114.9	134.6	99.9	
Avg. . .	116.3	83.9	99.8	112.4	118.2	122.0	127.6	121.8											

PAPER AND PRINTING

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	92.0	98.7	102.0	104.4	108.7	114.6	115.8	115.9	104.8	Jan.	92.2	98.9	102.1	104.6	108.8	114.8	115.9	116.1	104.9	
Feb. . .	93.4	102.2	100.3	106.8	107.9	114.0	118.0	122.3	107.4	Feb.	93.4	102.2	100.3	106.8	107.9	114.0	118.0	122.3	107.4	
Mar. . .	97.9	102.7	104.0	107.9	111.6	115.8	119.0	122.8	107.5	Mar.	96.0	100.7	101.9	105.8	109.3	113.6	116.7	120.4	105.4	
Apr. . .	99.8	103.6	105.7	109.4	110.5	115.3	118.4	120.4	105.7	Apr.	98.1	101.7	103.7	107.5	108.5	113.2	116.3	118.2	103.7	
May . .	103.2	101.7	102.8	107.0	109.9	115.6	119.5	115.1	103.2	May	102.4	100.9	102.0	106.1	109.0	114.6	118.5	114.1	102.4	
June . .	100.7	100.8	98.0	106.1	110.4	113.8	117.8	112.2	97.6	June	101.7	101.8	99.0	107.1	111.6	114.9	119.0	113.4	98.6	
July . .	97.4	95.6	102.0	106.4	107.1	109.9	109.2	106.9	91.9	July	100.5	98.7	105.4	109.8	110.6	113.4	112.7	110.4	94.9	
Aug. . .	88.3	93.1	98.6	107.1	107.0	111.7	115.4	108.2	93.1	Aug.	90.5	95.5	101.2	109.9	109.8	114.7	118.5	111.1	95.6	
Sept. .	92.7	97.8	99.8	107.1	108.3	112.9	122.8	109.8	96.1	Sept.	93.3	98.7	100.7	107.9	109.2	113.9	123.9	110.8	97.0	
Oct. . .	96.3	101.9	105.3	110.1	110.2	116.6	121.6	111.8	94.9	Oct.	95.2	100.7	104.0	108.8	109.0	115.3	120.2	110.5	93.9	
Nov. . .	101.2	102.2	105.6	111.0	112.8	117.9	120.5	107.7	92.3	Nov.	100.4	101.4	104.7	110.1	111.8	116.9	119.6	106.8	91.5	
Dec. . .	99.8	105.4	107.5	114.1	113.7	116.2	118.0	109.2		Dec.	98.8	104.3	106.5	113.0	112.6	115.0	116.9	108.1		
Avg. . .	96.9	100.5	102.6	108.1	109.8	114.5	118.0	113.5												

CHEMICALS

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	93.6	97.6	100.9	101.2	112.5	111.9	117.5	119.3	101.3	Jan.	93.5	97.5	101.0	102.3	114.6	114.2	120.7	122.5	103.9	
Feb. . .	95.2	99.6	103.7	106.9	109.3	114.1	118.3	117.5	103.2	Feb.	93.2	97.8	102.3	105.7	109.4	114.9	119.3	117.8	103.8	
Mar. . .	93.6	103.7	102.9	112.7	112.9	108.7	115.2	116.1	104.5	Mar.	93.7	103.9	102.7	112.5	112.7	108.4	114.7	115.4	104.1	
Apr. . .	102.5	103.4	103.3	112.9	112.1	115.3	119.4	120.1	103.4	Apr.	101.9	102.7	102.5	111.6	110.6	113.9	117.6	118.1	101.9	
May . .	98.6	104.9	105.8	115.1	114.1	118.1	124.2	120.8	111.7	May	98.8	104.6	105.9	114.6	112.6	116.3	121.8	118.3	109.4	
June . .	99.3	104.0	102.9	116.4	105.3	115.9	125.7	117.3	104.3	June	99.5	103.6	103.3	115.7	104.4	114.9	124.9	116.5	103.5	
July . .	98.5	95.9	104.7	118.7	107.6	112.3	117.6	112.3	100.3	July	99.8	96.9	106.3	121.3	109.8	114.3	120.0	114.4	104.8	
Aug. . .	96.4	100.6	105.3	114.9	110.6	114.6	123.0	116.4	103.1	Aug.	97.9	102.1	106.1	114.8	110.5	114.3	122.4	115.8	99.7	
Sept. .	96.2	98.3	92.9	116.0	111.2	121.9	127.0	113.1	103.4	Sept.	98.5	100.9	95.3	118.2	112.3	123.0	128.2	114.2	104.1	
Oct. . .	96.4	98.8	93.4	120.6	116.8	120.3	126.5	113.2	102.4	Oct.	96.5	99.1	93.0	119.8	115.6	118.5	124.3	111.2	100.7	
Nov. . .	100.3	104.8	98.7	122.3	114.4	120.0	124.9	109.5	107.3p	Nov.	99.1	103.6	97.5	121.2	113.6	119.5	124.3	109.1	106.9p	
Dec. . .	103.1	103.6	97.4	118.6	112.6	117.6	122.7	104.8		Dec.	101.3	102.1	96.3	118.6	113.3	118.6	124.0	106.3		
Avg. . .	97.8	101.3	101.0	114.7	111.6	115.9	121.8	115.0												

ELECTRIC POWER

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	84.1	104.0	115.2	130.2	148.1	152.7	180.8	212.2	193.5	Jan.	79.3	98.1	108.7	122.8	139.7	144.1	170.6	200.2	182.5	
Feb. . .	85.1	102.9	114.3	134.2	147.9	153.3	190.6	203.3	193.5	Feb.	80.3	97.1	107.8	126.6	139.5	144.6	179.8	191.8	182.5	
Mar. . .	85.0	97.9	109.1	130.5	144.8	158.0	183.2	202.8	191.5	Mar.	83.3	96.0	107.0	127.9	142.0	154.9	179.6	198.8	187.7	
Apr. . .	83.0	96.7	108.2	122.1	139.4	155.6	189.0	199.1	193.2	Apr.	84.7	98.7	110.4	124.6	142.2	158.8	192.9	203.2	197.1	
May . .	82.3	92.2	104.4	117.1	134.6	149.2	182.0	190.4	187.5	May	88.5	99.1	112.3	125.9	144.7	160.4	195.7	204.7	201.6	
June . .	81.5	91.0	108.4	124.4	137.1	155.2	176.2	182.7	182.9	June	85.8	95.8	114.1	130.9	144.3	163.4	185.5	192.3	192.5	
July . .	80.4	89.5	109.6	122.3	131.4	158.3	175.9	173.7	182.2	July	86.5	96.2	117.8	131.5	141.3	170.2	189.1	186.8	195.9	
Aug. . .	83.6	90.0	110.8	126.7	138.0	163.8	186.1	176.2	182.8	Aug.	88.0	94.7	116.6	133.4	145.3	172.4	195.9	185.5	192.4	
Sept. .	85.2	96.0	116.6	133.8	140.0	166.3	189.8	187.1	190.0	Sept.	86.9	98.0	119.0	136.5	142.9	169.7	193.7	190.9	193.9	
Oct. . .	93.7	103.7	124.7	141.4	146.5	181.7	212.2	196.7	197.4	Oct.	91.0	100.7	121.1	137.3	142.2	176.4	206.1	191.0	191.7	
Nov. . .	96.0	104.8	125.4	149.3	151.6	178.9	209.9	193.6	191.1	Nov.	92.3	100.8	120.6	143.6	145.8	172.0	201.8	186.2	183.8	
Dec. . .	98.8	114.0	133.6	152.8	156.0	175.2	213.4	199.6		Dec.	92.3	106.5	124.9	142.8	145.8	163.7	199.4	186.5		
Avg. . .	86.6	98.6	115.0	132.1	143.0	162.4	190.8	193.1												

RADIO AND MUSICAL INSTRUMENTS

	Without seasonal adjustment										Adjusted for seasonal variation									
	1923	1924	1925	1926	1927	1928	1929	1930	1931		1923	1924	1925	1926	1927	1928	1929	1930	1931	
Jan. . .	100.0	139.0	89.1	94.1	125.9	154.4	104.9	108.3	108.8	Jan.	98.0	136.3	87.4	92.3	123.4	151.4	102.8	106.2	106.7	
Feb. . .	101.9	136.4	59.1	99.1	120.1	151.2	120.6	86.8	93.4	Feb.	107.3	143.6	62.2	104.3	126.4	159.2	126.9	91.4	98.3	
Mar. . .	102.5	126.5	43.3	101.6	116.4	123.2	99.2	77.6	72.4	Mar.	119.2	147.1	50.3	118.1	135.3	143.3	115.3	90.2	84.2	
Apr. . .	103.9	104.0	37.5	100.5	115.4	110.9	112.1	76.5	88.6	Apr.	131.5	131.6	47.5	127.2	146.1	140.4	141.9	96.8	112.2	
May . .	101.7	104.9	41.9	97.1	107.7	106.1	169.7	83.2	74.1	May	125.6	129.5	51.7	119.9	133.0	131.0	209.5	102.7	91.5	
June . .	105.7	103.5	46.5	103.7	108.5	126.7	173.2	85.9	67.3	June	124.4	121.8	54.7	122.0	127.6	149.1	203.8	101.1	79.2	
July . .	105.7	96.4	42.3	114.5	119.0	156.1	215.6	131.8	72.8	July	117.4	107.1	47.0	127.2	132.2	173.4	239.6	146.4	80.9	
Aug. . .	97.0	100.0	83.4	108.5	122.2	175.2	276.9	214.8	81.3	Aug.	90.7	93.5	77.9	101.4	114.2	163.7	258.8	200.7	76.0	
Sept. .	120.6	109.8	88.9	111.5	131.9	197.1	248.4	309.2	82.6	Sept.	109.6	99.8	80.8	101.4	119.9	179.2	225.8	281.1	75.1	
Oct. . .	122.2	114.2	116.3	151.9	124.9	201.8	227.1	356.8	109.6	Oct.	99.3	92.8	94.6	123.5	101.5	164.1	184.6	290.1	89.1	
Nov. . .	135.9	122.9	122.9	164.9	135.4	193.7	130.9	222.8	104.9	Nov.	108.7	98.3	98.3	131.9	108.3	155.0	104.7	178.2	83.9	
Dec. . .	139.4	124.4	110.0	140.3	166.9	155.2	133.6	130.4		Dec.	119.1	106.3	94.0	119.9	142.6	132.6	114.2	111.5		
Avg. . .	111.4	115.2	73.4	115.6	124.5	154.3	167.7	157.0												