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CHAPTER V

Interregnum
Production, Price and Cost Changes, 1913-1923

The End of an Era

THE changed conditions which followed the outbreak of the World War brought certain immediate shifts in economic tendencies. Many of these changes were closely associated with the temporary conditions due to the war. Other changes were more enduring, and their effects persisted, to shape the direction of American economic development during the years which followed the signing of the Armistice.

The war altered the directions in which the productive energies of the United States were being expended. Even before our entrance the demands of the warring countries had placed heavy emphasis on the production of food, munitions, ships, clothing, chemicals and similar goods. The construction industries and other industries producing goods not directly necessary for subsistence or for the prosecution of war languished.

In the field of prices the moderate but persistent advance which had characterized the preceding eighteen years was quickened. Between 1914 and 1920 the level of wholesale prices in the United States advanced 127 per cent, as compared with an increase of 46 per cent between 1896 and 1914. Of greater importance than the rise in the price level were the abrupt changes which occurred in relations among the prices of important commodity groups. The slow secular divergences of prices in different groups which had characterized the two preceding decades were succeeded by sharply accentuated alterations in price relations, many of them reversing tendencies previously prevailing. In 1917 a further important factor, that of price control, was introduced. During the preceding quarter century the development of monopolies and semi-monopolies and the consummation of various formal and informal trade agree-

ments had encroached upon the region of free prices. The area within which competitive forces of supply and of demand worked freely had been diminishing. The introduction of governmental price control in 1917 brought an immediate and material widening of the area of price regulation, and a consequent reduction in the area of price freedom.

Shifts in the character of our foreign trade reflected changing conditions of demand and of production resulting from the war. In addition, there was an enormous advance in the volume of exports, representing not only our own military efforts, but sales, credit advances and the out-flow of capital to allied and neutral nations.

The check to immigration, the drafting of men for military service and the increasing demand for labor brought substantial wage advances in most industries. During the war-time advance and, even more, during the sharp post-war deflation, labor improved its position to a degree perhaps never before approached during an equal period of time. Swelling business volume and rising prices increased profits, particularly among the industries benefiting from war-time demands.

Of the more enduring changes brought by the war probably the most important was the shift of the United States from a debtor to a creditor status in the family of nations. Foreign capital invested in this country during the many years of industrial development preceding was repatriated in substantial amounts by the warring countries in financing their military efforts. In addition, capital loans, both private and governmental, were made by this country in unprecedented amounts. Heavy long-term credits were built up abroad in amounts far out-balancing the foreign credits still remaining in this country. Enduring, also, were many of the changes in our foreign trade relations and in the character of our export trade. The withdrawal, in greater or less degree, of the fighting countries from foreign markets during the war made new openings for the export trade of the United States.

All these movements changed materially the make-up of the stream of currently-produced values, and altered the terms upon which goods and services were exchanged among different economic groups. These shifts we shall explore in succeeding pages.

It is not the purpose of this chapter to review in detail the numerous economic movements occurring during the war years.

We must, however, bridge the gap between the ending of the pre-war period and the beginning of the post-war epoch with which the following chapters are concerned. Because of the character of the data, many of which relate only to census years, and because of the unsettled conditions prevailing just prior to and just after the war, the precise limits of this interregnum are difficult to set. For the purposes of the following discussion one terminus will be 1913 or 1914, the other, 1922 or 1923. We shall briefly summarize certain of the major changes in production, prices and costs occurring between these years. No attempt will be made to deal with other economic elements.

Production and Construction

The general course of production in the United States between 1913 and 1922 is indicated by the measurements in the following table, which are shown graphically in Figure 35.

TABLE 73

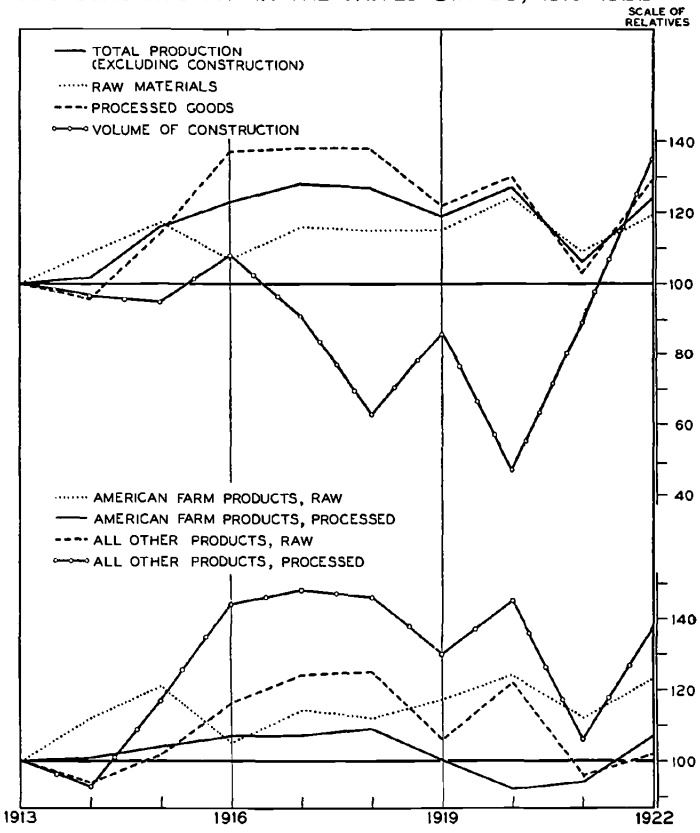
Changes in Physical Volume of Production in the United States, 1913-1922 [a]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Raw materials	Manufactured goods	American farm products		All other products		Total volume of production
			Raw	Processed	Raw	Processed	
1913	100	100	100	100	100	100	100
1914	109	96	112	101	94	93	102
1915	117	114	121	104	102	117	116
1916	107	137	105	107	116	144	123
1917	116	138	114	107	124	148	128
1918	115	138	112	109	125	146	127
1919	115	122	117	100	106	130	119
1920	124	130	124	92	122	145	127
1921	109	103	112	94	96	106	106
1922	119	129	123	107	102	137	124

[a] The index numbers of the output of raw materials are based upon computations of Stewart for the early years (1913-1919) and of the Federal Reserve Board and the Bureau of Agricultural Economics for the later period. (See Walter W. Stewart, "An Index of the Physical Volume of Production," *The American Economic Review*, Vol. XI, No. 1, March, 1921, pp. 57-70; *Federal Reserve Bulletin*, Vol. 13, No. 2, February, 1927, pp. 100-103; U. S. Department of Agriculture, *Yearbook of Agriculture, 1931*, p. 974.) The index numbers of the output of manufactured goods for the census years are averages secured from sample industries, adjusted, as in Chapter I, to represent all manufacturing industries. Interpolations for intercensal years have been based upon the index numbers of manufacturing production of Stewart and of the Federal Reserve Board.

FIGURE 35

CHANGES IN PHYSICAL VOLUME OF PRODUCTION AND CONSTRUCTION IN THE UNITED STATES, 1913-1922



The aggregate volume of production increased rather rapidly between 1914 and 1917. Thereafter, to 1920, it remained close to a constant level approximately 27 per cent above the 1913 output. (A minor fall occurred in 1919.) The decline accompanying the recession of 1921 was pronounced, but a new advance was well under way by the following year.

The year 1922 marks the beginning of the post-war period to be studied in subsequent chapters. It is pertinent to inquire as to the relative level of production in that year. The figures in Table 73 indicate an advance of 24 per cent in physical volume of production between 1913 and 1922. In comparison, total production

expanded by 42 per cent during the nine years from 1901 to 1910; from 1904 to 1913 there was a gain of 32 per cent in volume of physical output. It is clear that total production in 1922 did not stand at a particularly high level, with reference to output in 1913.[1]

The index numbers tracing changes in the output of raw and of processed goods show striking contrasts during the years of war-time activity. These years brought no exceptional increase in the production of raw materials in the United States. Between 1914 and 1919 the output of such materials ranged from a level 7 per cent above that of 1913 to a level 17 per cent above. Manufactured goods increased, by 1918, to a level 38 per cent above that of the base year. The sharp advance in the output of raw materials between 1919 and 1920 is notable, because of its bearing on the behavior of raw material prices during the recession which began in 1920. The terminal year, 1922, found the volume of production of manufactured goods 29 per cent above the 1913 level, while the production of raw materials was about 19 per cent greater than in 1913.

The war-time advance in the output of processed commodities not originating on American farms[2] materially exceeded that of any of the other groups represented in Table 73. The extreme drop in the output of this group during the recession of 1921, and the very slight change which this recession brought in the production of farm products, are to be noted. The index numbers of agricultural production show slight evidence of adaptation of production to changing conditions resulting from the post-war recession. The result of inflexibility of production was, inevitably, a severe price drop. Non-farm products, more flexible in production, were less severely affected by the general price recession.

In the terminal year, 1922, the output of raw products of American farms stood at a high level, 23 per cent above the 1913 base. This expansion in output, resulting from the war-time stimulus, coincided in time with an apparent shift of emphasis in consumer demand from articles of food and clothing to more durable con-

[1] The year 1922 was marked by expanding business; the peak of prosperity was not reached until 1923. The base year, 1913, was one of general business contraction.

[2] This group includes fabricated minerals, and processed forms of such materials as rubber, silk, lumber and wood pulp. Minerals are the most important element in the total.

sumption goods. Price weakness and economic distress were unavoidable resultants.

Construction

During the war and immediate post-war years new building followed a course quite different from that of the production of movable goods. The following index, based upon the shipments of construction materials, traces the tendencies prevailing in this field. The series is plotted in Figure 35.

TABLE 74

VOLUME OF CONSTRUCTION IN THE UNITED STATES, 1913-1922[a]

Year	Volume of construction
1913	100
1914	97
1915	95
1916	108
1917	91
1918	63
1919	86
1920	47
1921	89
1922	135

[a] Compiled by Associated General Contractors from records of shipments of construction materials. The index is a simple average of structural steel bookings, common brick bookings, Portland cement shipments, loadings of sand, gravel and stone, face brick shipments and shipments of enameled sanitary ware. The index numbers given are averages of monthly figures. See *Survey of Current Business,* Annual Supplement, 1931.

Up to 1916 there was no sustained drop in construction, but during the succeeding five years construction was markedly subnormal. The level reached in 1920 was more than 50 per cent below that of 1913. Recovery began in 1921 and was well under way in 1922. The shortage of construction of all sorts which accumulated between 1917 and 1921 led to an abnormally rapid expansion of construction activities after 1921. The effects of this expansion were felt throughout the economic system during the years which followed.

The marked contrast between construction and volume of production in 1920 is important because of the strikingly different rôles played by construction in the recessions beginning in 1920 and in 1929. The former began with construction far below normal,

while the recession of 1929 began with the volume of construction in general at excessively high levels.

Volume of Manufacturing Production

The years in which the Census of Manufactures was taken are not most appropriately placed for a detailed study of changes in the volume of manufacturing production during the war and immediate post-war years. General changes during the entire period may be followed, however, by the use of census figures, which for the industries covered, are far more comprehensive than are the annual index numbers listed in preceding tables.[1]

TABLE 75

GROWTH OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

Index Numbers of Physical Volume of Production, Number of Wage-earners and per Capita Output

Year	Physical volume of production	Number of wage-earners	Output per wage-earner
1914	100.0	100.0	100.0
1919	127.7	124.5	102.6
1921	105.7	100.1	105.6
1923	156.3	130.3	120.0

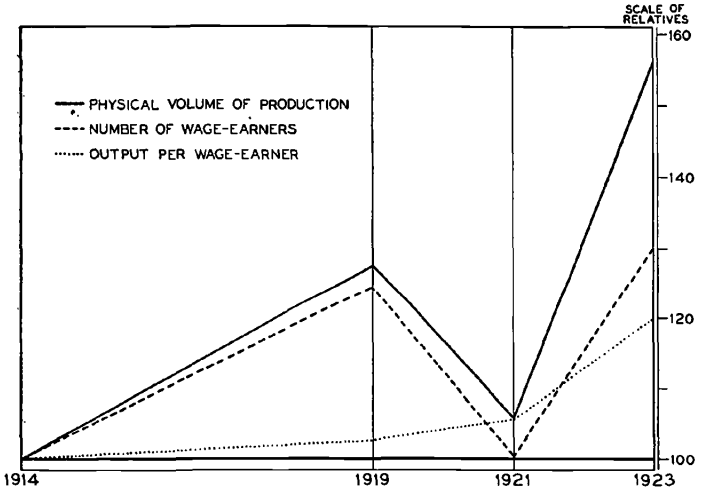
The advance in production to 1919, the drop in 1921 and the remarkable spurt from 1921 to 1923 are reflected in these index numbers, shown graphically in Figure 36. Viewing the changes in physical volume of production as net results of changes in the number of wage-earners employed and in output per wage-earner, it will be seen that the latter was a relatively constant element in the situation between 1914 and 1921. The advance in output from 1914 to 1919 was accomplished largely through an increase in the number of wage-earners; the drop from 1919 to 1921 reflected, primarily, a decline in the number of workers. There was an advance in

[1] These index numbers relate to a selected sample, representing approximately 45 per cent of the value of product of all manufacturing industries. The present measurements differ somewhat from the indexes of manufacturing production given in Table 73, which have been adjusted to the data of all census industries. In a later note (pp. 198-201) index numbers corresponding to those in Table 75, but adjusted to all census industries, are given.

FIGURE 36

GROWTH OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

VOLUME OF PRODUCTION, NUMBER OF WAGE-EARNERS AND OUTPUT PER WAGE-EARNER



productivity during the seven years from 1914 to 1921, but it was not great, in comparison with pre-war changes. Substantial gains in both factors contributed to the gain in aggregate output between 1921 and 1923. The number of wage-earners increased by 30.2 per cent over this two-year period, while output per wage-earner, which is attributable to technical and organizational improvements, as well as to enhanced skill, increased by 13.6 per cent.

§ *Changes in physical volume of production and in output per wage-earner, individual industries.*—Records relating to the physical volume of production and to output per wage-earner in individual manufacturing industries are given, for reference, in Tables 76 and 77, following. Averages derived from the central items of frequency distributions and designed to represent typical situations in manufacturing industries, are presented in these tables, in addition to the measurements relating to individual industries. The averages of physical output which appear at the foot of Table 76 are slightly lower than those obtained by the 'ideal' formula (see Table 75). Somewhat greater are the differences between similarly derived index numbers of output per wage-earner (see Tables 75 and 77). A typical manufacturing industry suffered a loss in productivity per worker between 1914 and 1921. Between 1921 and 1923, however, the gain in productivity shown by these averages was greater than the gain shown by the earlier index numbers. In 1923,

for the typical manufacturing industry, output was greater by 45 per cent than in 1914, and output per worker was greater by almost 13 per cent.

TABLE 76

CHANGES IN PHYSICAL VOLUME OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of physical volume of production			
	1914	1919	1921	1923
Motor vehicles, including bodies and parts.	100.0	408.7	304.9	637.2
Rubber goods	100.0	286.6	218.6	369.1
Petroleum refining	100.0	194.7	231.2	316.7
Linoleum and asphalted-felt-base floor coverings	100.0	187.9	185.6	288.0
Coke, not including gas-house coke	100.0	141.5	97.8	205.3
Condensed and evaporated milk	100.0	234.0	189.9	201.8
Iron and steel: steel works and rolling mills	100.0	145.8	87.7	186.3
Ice, manufactured	100.0	139.3	158.2	180.7
Iron and steel: blast furnaces	100.0	135.5	72.3	173.8
Rice cleaning and polishing	100.0	160.1	169.8	171.7
Butter and cheese	100.0	122.2	139.0	166.1
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	136.2	100.0	159.2
Paints and varnishes	100.0	127.3	107.1	158.4
Woolen goods	100.0	122.4	110.8	157.6
Silk manufactures	100.0	133.0	121.4	155.2
Gas, manufactured, illuminating and heating	100.0	135.6	128.6	152.7
Cast-iron pipe	100.0	70.1	77.6	151.2
Paper and wood pulp	100.0	119.5	101.4	147.1
Carpets and rugs, wool, other than rag	100.0	86.4	83.5	144.8
Salt	100.0	142.2	101.9	144.2
Knit goods	100.0	113.7	109.5	139.1
Musical instruments: pianos	100.0	128.7	83.7	138.4
Wire, drawn from purchased bars or rods	100.0	105.4	55.9	137.3
Slaughtering and meat packing, wholesale	100.0	131.7	109.0	137.3
Explosives	100.0	126.3	88.1	137.1
Soap	100.0	127.2	114.8	132.7
Sugar refining, cane	100.0	106.1	113.0	132.5
Cars, steam and electric railroad, not built in railroad repair shops	100.0	105.9	58.2	131.5
Sand-lime brick	100.0	89.3	58.3	129.5
Cotton goods	100.0	106.9	98.5	127.5
Wood distillation and charcoal manufacture	100.0	124.2	52.7	127.1
Cement	100.0	93.2	97.8	126.6
Clay products (other than pottery) and non-clay refractories	100.0	76.1	72.9	126.3

TABLE 76—*Continued*

Industry	Index numbers of physical volume of production			
	1914	1919	1921	1923
Hats, wool-felt	100.0	139.7	88.5	125.9
Wool shoddy	100.0	119.1	56.2	118.2
Lace goods, cotton	100.0	88.9	77.1	112.6
Turpentine and rosin	100.0	71.6	98.0	110.5
Worsted goods	100.0	88.2	89.6	107.8
Motorcycles, bicycles, and parts	100.0	149.1	68.0	107.1
Hats, fur-felt	100.0	103.2	88.6	102.4
Oilcloth	100.0	62.1	78.0	101.9
Sugar, beet	100.0	98.0	140.2	99.9
Lime	100.0	82.2	63.1	99.5
Flour and other grain-mill products	100.0	105.7	91.0	96.2
Lumber and timber products	100.0	92.5	78.0	95.0
Cordage and twine	100.0	92.3	75.9	94.6
Fertilizers	100.0	92.0	68.6	87.2
Jute and linen goods	100.0	77.2	54.8	81.2
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	114.1	53.9	73.3
Sugar, cane, not including products of refining	100.0	95.6	92.0	63.1
Musical instruments: organs	100.0	74.2	81.7	59.0
Oil, cake, and meal, cottonseed	100.0	83.1	60.2	52.3
Average [a]	100.0	125.3	99.7	145.3

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on 'value added', averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

TABLE 77

CHANGES IN OUTPUT PER WAGE-EARNER IN MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of physical volume of production per wage-earner			
	1914	1919	1921	1923
Motor vehicles, including bodies and parts	100.0	151.2	181.7	199.5
Rubber goods	100.0	133.8	156.6	198.1
Linoleum and asphalted-felt-base floor coverings	100.0	153.7	144.3	160.6
Gas, manufactured, illuminating and heating	100.0	137.7	160.1	157.2
Coke, not including gas-house coke	100.0	101.8	128.3	152.6

TABLE 77—*Continued*

Industry	Index numbers of physical volume of production per wage-earner			
	1914	1919	1921	1923
Ice, manufactured	100.0	103.7	146.4	149.9
Musical instruments: pianos	100.0	133.8	126.1	148.7
Condensed and evaporated milk	100.0	102.7	120.5	146.0
Iron and steel: blast furnaces	100.0	91.9	113.5	139.0
Explosives	100.0	86.0	123.9	135.2
Silk manufactures	100.0	113.4	108.0	133.9
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	107.1	116.0	131.7
Hats, fur-felt	100.0	118.6	135.7	130.2
Carpets and rugs, wool, other than rag	100.0	118.0	114.1	128.8
Rice cleaning and polishing	100.0	95.0	109.7	122.0
Sand-lime brick	100.0	96.8	85.1	121.5
Petroleum refining	100.0	83.9	92.8	120.4
Clay products (other than pottery) and non-clay refractories	100.0	97.2	103.4	119.9
Iron and steel: steel works and rolling mills	100.0	96.7	92.6	119.3
Wool shoddy	100.0	99.8	102.7	118.7
Lace goods, cotton	100.0	102.0	89.7	114.7
Wire, drawn from purchased bars or rods	100.0	94.0	66.3	113.4
Butter and cheese	100.0	95.2	106.2	113.4
Paints and varnishes	100.0	95.1	95.3	111.3
Soap	100.0	88.0	97.9	110.1
Motorcycles, bicycles, and parts	100.0	91.3	105.2	108.5
Paper and wood pulp	100.0	92.9	85.1	107.8
Knit goods	100.0	98.9	101.6	107.5
Salt	100.0	110.6	85.8	106.8
Woolen goods	100.0	95.5	96.3	106.8
Fertilizers	100.0	79.5	92.4	106.8
Flour and other grain-mill products	100.0	90.5	99.7	105.9
Sugar, beet	100.0	66.6	82.4	105.5
Jute and linen goods	100.0	98.8	77.4	105.1
Turpentine and rosin	100.0	83.3	115.9	104.5
Oilcloth	100.0	67.2	100.7	103.6
Cotton goods	100.0	94.1	90.7	102.6
Slaughtering and meat packing, wholesale	100.0	80.8	92.0	102.2
Cement	100.0	101.9	104.0	100.7
Sugar refining, cane	100.0	65.6	82.2	97.7
Lime	100.0	87.5	73.2	97.1
Musical instruments: organs	100.0	116.7	106.1	97.0
Worsted goods	100.0	93.1	92.6	96.7
Cars, steam and electric railroad, not built in railroad repair shops	100.0	111.5	70.4	94.8
Cordage and twine	100.0	82.5	82.0	91.0
Wood distillation and charcoal manufacture	100.0	70.6	72.2	89.9
Oil, cake, and meal, cottonseed	100.0	67.7	81.2	89.5

TABLE 77—*Continued*

Industry	Index numbers of physical volume of production per wage-earner			
	1914	1919	1921	1923
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	101.3	74.5	88.0
Cast-iron pipe	100.0	69.7	77.9	88.0
Lumber and timber products	100.0	87.4	94.9	84.9
Sugar, cane, not including products of refining	100.0	56.7	121.7	80.6
Hats, wool-felt	100.0	120.1	76.8	80.0
Average[a]	100.0	95.5	95.3	112.8

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on 'value added', averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

We pass now to the record of production in terms of establishments.

TABLE 78

GROWTH OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

Index Numbers of Physical Volume of Production, Number of Establishments and Output per Establishment

Year	Physical volume of production	Number of establishments	Output per establishment
1914	100.0	100.0	100.0
1919	127.7	112.6	113.5
1921	105.7	94.1	112.4
1923	156.3	98.7	158.4

From 1914 to 1919 the volume of production was increased by means of a substantial addition to the number of establishments in operation.[1] The recession of 1920-21 brought a decline of more than 16 per cent, a far greater drop in number of establishments than had been recorded in any census interval since 1899. During the two following years a slight increase occurred. Perhaps even more significant is the tremendous increase, amounting to approxi-

[1] This may reflect, in part, an increased coverage in the 1919 census. The exclusion from these averages of all establishments having an output valued at less than $5,000 would tend, however, to minimize the effect of wider coverage in that year. See the footnote to p. 37.

mately 41 per cent, in output per establishment between 1921 and 1923. This gain, exceeding any previous record, is a dramatic indication of the part played by large-scale production in the economic advance of the nineteen-twenties.

Breaking output per establishment into two constituent elements, we have the following record.

TABLE 79

GROWTH OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

Factors Affecting Output per Establishment

Year	Output per establishment	Number of workers per establishment	Output per worker
1914	100.0	100.0	100.0
1919	113.5	110.6	102.6
1921	112.4	106.3	105.6
1923	158.4	132.0	120.0

The human element was called upon to swell production during the war-time emergency. The gain in output per establishment from 1914 to 1919 was due, primarily, to an increase in the number of workers per establishment. Technical improvements, which are reflected in growing output per worker, were not numerous during this period. In the revival following 1921 both human and technological factors were called upon to augment production, and we find workers per establishment and output per worker increasing notably.

§ *Volume of manufacturing production, revised measurements.*— In dealing with pre-war production movements reference was made to the problem presented by new industries and by industries the products of which cannot be enumerated. Current index numbers of production are necessarily limited to commodities for which quantity statistics are available. In correcting for this omission by deriving index numbers of volume of manufacturing production from census statistics of 'value added' and number of workers employed, we secured measurements which indicated a considerably more rapid growth of production between 1899 and 1914 than was shown by the index numbers based directly on physical units. A similar method may be employed for the period 1914-1923. The following figures indicate the relative rates of change in 'value added' in industries included in the sample, and in excluded industries.

TABLE 80

CHANGES IN VALUE ADDED BY MANUFACTURE, 1914-1923

(1) Year	(2) 'Value added', all census industries	(3)	(4) 'Value added', industries included in sample	(5)	(6) 'Value added', industries not included in sample	(7)
	In millions of dollars	In relatives	In millions of dollars	In relatives	In millions of dollars	In relatives
1914	9,710	100.0	3,335	100.0	6,375	100.0
1919	24,809	255.5	9,365	280.8	15,444	242.3
1921	18,332	188.8	6,357	190.6	11,975	187.8
1923	25,850	266.2	9,782	293.3	16,068	252.0

Between 1914 and 1919 the value added by manufacturing industries included in the detailed enumeration increased approximately 181 per cent, as compared with an increase of 142 per cent among industries not included in the index. Over the seven-year period from 1914 to 1921 there was no appreciable difference between the two groups. When the comparison is carried to 1923 we again find a more rapid increase among the industries included in our index than among the excluded industries.

It is apparent that the included industries are not in all respects representative of the total. To correct for this defect we may derive, as in Chapter I, new index numbers designed to measure changes in the aggregate output of all manufacturing industries. These are given below.

TABLE 81

DERIVED INDEX NUMBERS OF PHYSICAL VOLUME OF PRODUCTION, 1914-1923

All Manufacturing Industries of the United States

Year	Index numbers of physical production, derived from measurements of cost of fabrication, per unit of product	Index numbers of physical production, derived from measurements of output per capita
1914	100.0	100.0
1919	119.3	133.9
1921	108.0	106.4
1923	146.9	152.7

Two different estimates of the change in volume of production among all manufacturing industries appear in this table. The first of

these is based on the assumption that changes in the cost of fabrication, per unit of product, among all manufacturing industries, were the same as the changes occurring among the industries for which adequate quantity statistics are available. The second estimate proceeds from the assumption that changes in output per worker were the same among all industries as among the group included in the index.

The differences between the two derived index numbers are not wide, except for the year 1919. The difference for this date indicates, we may assume, that there was less uniformity among manufacturing industries during the disturbed years from 1914 to 1919 than is usually found. Changes in output per worker and in fabrication costs were less consistent from industry to industry than is usually the case. By 1921, however, something approaching uniformity was again attained, and no great divergence appears thereafter.

Averaging the two derived index numbers of production we secure the measurements given in column (3) below. These constitute our best estimate of the true course of production among all manufacturing industries between 1914 and 1923. These are contrasted with index numbers based directly on physical quantities produced in 52 industries, and on annual data.

TABLE 82

COMPARISON OF INDEX NUMBERS OF PHYSICAL VOLUME OF MANUFACTURING PRODUCTION, 1914-1923

(1)	(2)	(3)	(4)
	Census index numbers of volume of fabrication		
Year	Based on 52 industries	Derived from 'value added' and number of employees, all industries	Unadjusted annual index numbers of manufacturing output [a]
1914	100.0	100.0	100.0
1919	127.7	126.6	132.6
1921	105.7	107.2	105.9
1923	156.3	149.8	159.6

[a] Stewart's index for the years 1914-1919, that of the Federal Reserve Board for the rest of the period.

These three index numbers follow the same general course between 1914 and 1923. No such clear divergence appears as was found among the measurements for the years preceding the war. The greatest difference occurs in 1923, when the derived (and most comprehensive) index is appreciably lower than the other measurements. The net advance in manufacturing production between 1914 and 1923 appears to have been less than is shown by index numbers based on the output of the standard commodities for which production statistics are readily

available. This situation reverses that found to prevail in the pre-war period.

Changes in Commodity Prices, 1913-1922

The numerous shifts in economic relations which resulted from the price revolution occurring between 1913 and 1922 may not here be traced in detail, but certain of the general price movements of this period may be followed. These movements were, of course, radical in character; their effects have persisted.

TABLE 83

Wholesale Price Movements, 1913-1922 [a]

(1) Year	(2) Changes in level of wholesale prices (index of U. S. Bureau of Labor Statistics)	(3) Index of price dispersion	(4) Average monthly variability of wholesale prices
1913	100.0	8.4	3.7
1914	97.6	7.4	4.4
1915	99.6	10.6	5.9
1916	122.5	13.7	8.7
1917	168.3	12.4	10.6
1918	188.1	14.2	7.3
1919	198.6	11.9	9.7
1920	221.2	15.7	10.8
1921	139.8	18.3	8.5
1922	138.5	11.7	6.5

[a] For an explanation of the index of dispersion see *The Behavior of Prices*, National Bureau of Economic Research, pp. 256 ff. The method of measuring monthly price variability is explained in the same volume, pp. 370 ff. The measurements in col. (3) are based upon 391 price series, those in col. (4) upon 214 price series.

The sharp rise in prices which began late in 1915, reaching a peak in 1920, and the ensuing rapid decline are phenomena still fresh in memory. Still remembered, also, are the prosperity which accompanied the war-time advance and the pains of readjustment which followed upon the collapse of prices in 1921. In 1922, the year which marks the beginning of the post-war advance reviewed in succeeding chapters, the level of wholesale prices stood some 40 per cent above that of 1913.

The index of dispersion and the index of monthly variability of prices, given in columns (3) and (4) above, define other aspects

of the changes occurring during this period. The measures of dispersion indicate the degree of divergence of the prices of individual commodities at wholesale, that is, the degree of scattering of these prices from year to year. Starting with a relatively low degree of dispersion in 1913, the index rises to an abnormally high level in 1921. There was some decline between 1921 and 1922, but the figure for 1922 is still very high, judged with reference to prewar standards. For the entire period from 1915 to 1922 the degree of year-to-year dispersion was greater than that recorded in any year back to 1899. These high index numbers reflect a constant disruption of price relations. There was no crystallization of relationships, no attainment of that degree of stability which had prevailed before the war. The indexes in column (4), which measure the average degree of fluctuation, from month to month, of the prices of individual commodities, confirm this evidence. These averages are high between 1916 and 1922, higher than in any year between 1890 and 1915.

This fact has a direct bearing upon the character of the price decline which accompanied the recession of 1920-21, and helps to differentiate this recession from that which began in 1929. In May, 1920, commodity prices started downward after a sharp elevenmonths' advance which had carried the general level up 23 per cent, and after a five-year advance amounting to 142 per cent. The level from which the decline started was not one which bore any of the aspects of permanence. The relations among different elements of the price structure which existed in May, 1920, had prevailed for only a short time. Flux had been the outstanding feature of the recent past. There had been no consolidation of the economic positions of different economic groups, no general making of long-term commitments on the basis of existing prices. As a result, when once the price decline was well under way the barriers to liquidation which are offered by a thoroughly consolidated position and a sense of permanence in commodity values were relatively weak. Within the eleven months of sharpest decline the drop amounted to 44 per cent, and the rate of decline per month averaged 5.1 per cent. Price recession was intense, but the violent change was concentrated within a period of less than a year.

The high index numbers of dispersion and variability are indicative of continuing instability of economic relations. Such conditions introduce uncertainty into business dealings and emphasize specula-

tive factors in commercial transactions. This whole period was a time of such change in the relations of industries, one to another, as had not existed during the entire quarter-century preceding. By 1922 the tide of change had begun to subside. Order was being established and elements of speculative uncertainty were growing less pronounced in business dealings.

§ *The influence of price changes on the value stream, 1913-1922.*— The steep advance and subsequent sharp decline of prices accentuated the changes which were occurring in volume of production. The accompanying alterations in total values of goods produced were of exceptional magnitude. These changes are indicated in the following table. The several index numbers are shown graphically in Figure 37.

TABLE 84

INDEX NUMBERS OF PHYSICAL VOLUME, PRICES AND AGGREGATE VALUES OF GOODS PRODUCED IN THE UNITED STATES, 1913-1922

Year	Physical volume of production	Wholesale prices	Aggregate values [a]
1913	100	100	100
1914	102	98	100
1915	116	100	116
1916	123	122	150
1917	128	168	215
1918	127	188	239
1919	119	199	237
1920	127	221	281
1921	106	140	148
1922	124	138	171

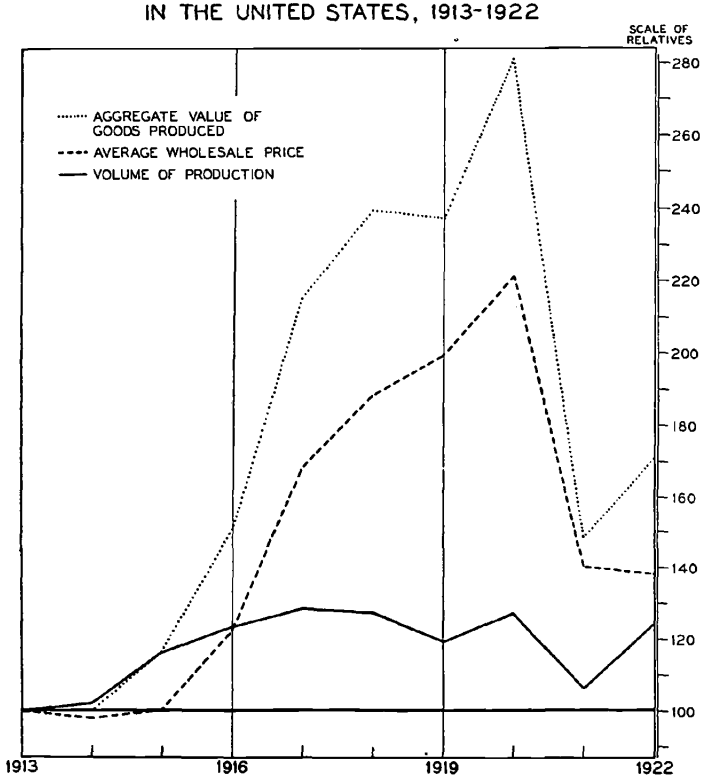
[a] The above price index (U. S. Bureau of Labor Statistics) measures changes in the average wholesale prices of units of goods, both raw and processed; the production index measures changes in output of units of raw and processed goods. The value series, derived by multiplying these index numbers together, measures changes in the aggregate value of transactions involved in the productive process. It does not relate to the total value of finished products alone.

The derivation of an index number of aggregate values from price and production index numbers represents a very rough approximation indeed, for the production and price index numbers are not based upon identical commodities. The general movements shown are probably correct, but the given figures for stated years should be looked upon only as estimates.

During the war the impression prevailed that the volume of production in this country attained exceptionally high levels. The above figures indicate that it was values and not physical quantities which were

FIGURE 37

CHANGES IN VOLUME OF PRODUCTION, AVERAGE PRICE AND AGGREGATE VALUE OF GOODS PRODUCED IN THE UNITED STATES, 1913-1922



growing with an amazing rapidity.[1] By 1916 the output of goods had increased by 23 per cent over 1913; aggregate values were up by 50 per cent. The peak came in 1920, when aggregate output was 27 per cent greater and aggregate values were 181 per cent greater than in 1913. This increase in total values of 181 per cent in seven years may be contrasted with the gain of approximately 97 per cent during the 13 years from 1901 to 1913. With the stream of values growing to such flood-tide proportions it is small wonder that the impression of prosperity was so pronounced. In the main, of course, rising prices accounted for this growth of values. The recession of 1921 cut values in half, though volume of output was reduced by but one-fifth. The period to be discussed in later chapters opens in 1922 with aggregate values of goods produced some 71 per cent greater than in 1913.

[1] See also the production, price and value index numbers appearing in *History of Prices During the War,* War Industries Board, Price Bulletin No. 1, p. 45.

Price Movements of Raw Materials and of Manufactured Goods

From 1901 to 1913 current prices of both raw materials and manufactured goods advanced, the former somewhat more rapidly. In terms of dollars of constant purchasing power the net increase for raw materials, per unit, during this thirteen-year period was approximately 3 per cent, while manufactured goods lost about 1 per cent in purchasing power. The situation prevailing at the end of the interregnum we are now studying was notably different, as is shown by the measurements in the next table, and by the graphs in Figure 38.

TABLE 85

RAW MATERIALS AND MANUFACTURED GOODS

Changes in Wholesale Prices and in Purchasing Power, 1913-1922 [a]

Year	Index numbers of wholesale prices		Index numbers of per-unit purchasing power	
	Raw materials	Manufactured goods	Raw materials	Manufactured goods
1913	100.0	100.0	100.0	100.0
1914	98.7	97.8	100.5	99.6
1915	104.2	102.0	101.4	99.2
1916	127.9	129.4	99.1	100.2
1917	174.4	169.4	101.9	98.9
1918	188.9	198.4	96.5	101.4
1919	196.1	206.1	96.4	101.3
1920	202.2	239.5	88.7	105.1
1921	125.0	162.7	83.0	108.0
1922	133.2	154.8	89.8	104.4

[a] These index numbers are unweighted geometric averages of price relatives, constructed by the National Bureau of Economic Research. The number of price series in each group in 1922 is given below:

Raw materials	136
Manufactured goods	330

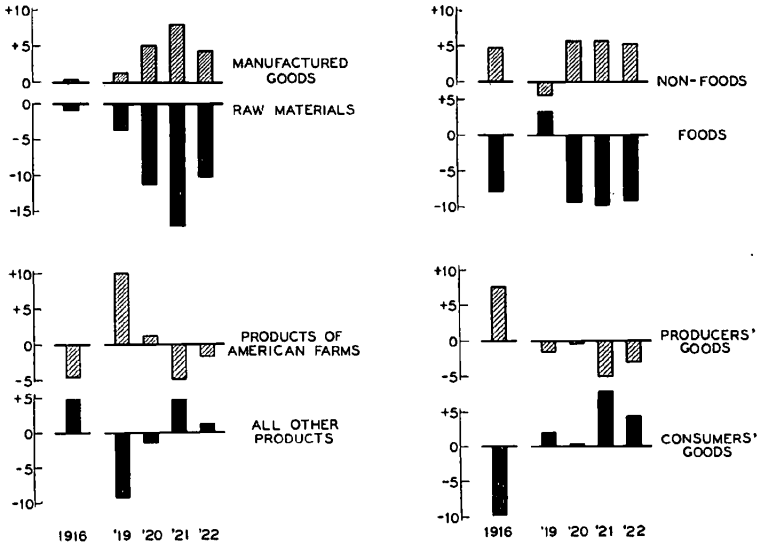
Up to 1917 no substantial differences appear between the prices of raw materials and of manufactured commodities. During the three succeeding years manufactured goods leaped upward in price, while raw materials, after scoring some advance between 1917 and 1918, remained for two years only slightly above the 1918 level. The price collapse of 1920-21 carried raw materials to much lower levels than were reached by the prices of manufactured goods.

These comparisons are of chief significance in their bearing

FIGURE 38

GRAPHIC REPRESENTATION OF CHANGES IN THE REAL VALUES, PER UNIT, OF COMMODITIES IN SELECTED GROUPS, 1913-1922

(CHANGES ARE MEASURED AS PERCENTAGE DEVIATIONS FROM 1913 PURCHASING POWER.)



on changes in the real per-unit values of goods of these two classes, in terms of commodities in general. By 1920, when wholesale prices had reached their peak, manufactured goods had gained, on the average, 5 per cent in purchasing power, while the per-unit value of raw materials had declined 11 per cent. Here was a distinct reversal of pre-war tendencies which had progressively enhanced the purchasing power of raw materials and had cheapened manufactured goods. The drop of prices in 1921 served still further to widen this margin. At average prices in that year the purchasing power of manufactured goods was 8 per cent higher than in 1913, while the purchasing power of raw materials was 17 per cent below the 1913 standard. The year 1922, which marks the end of the period here under review and the beginning of the period to be described in the following chapters, found manufactured goods still overvalued, in terms of pre-war standards, while the per-unit purchasing power of raw materials, although somewhat higher than in 1921, was still substantially lower than before the war. We shall have occasion later to discuss this reversal in greater detail. It was a

change of profound significance, the effects of which were felt by producers throughout the world during the decade of the 'twenties.

The effect of the war on the price variability of commodities in these two groups is indicated by the entries in the following table.

TABLE 86

RAW MATERIALS AND MANUFACTURED GOODS

Measurements of Variability of Wholesale Prices, 1898-1913, 1914-1921

Commodity group	Number of price series	Measurement of monthly variability of prices		Measurement of frequency of price change	
		1898-1913	1914-1921	1898-1913	1914-1921
Raw materials	49	8.2	10.9	.82	.83
Manufactured goods.	158	3.6	7.4	.34	.47

In both periods manufactured goods were distinctly less variable in price and were subject to less frequent price changes than were raw materials. The price disturbances of the war years increased somewhat the normally high variability of raw material prices. Far more pronounced, however, were their effects upon manufactured goods. For this group monthly price variability was more than doubled, and the frequency of price change was increased by approximately one-third.

It is a fact of very considerable importance that different elements of the price system possess different degrees of freedom to react to changes in conditions of supply or of demand. Certain elements are subject to a far higher degree of control and are far less sensitive to changing market conditions than are other price elements. These differences in rigidity, which have recently been so dramatically revealed, are clearly shown by the entries in the table above. Perhaps more striking is the fact that the prices of manufactured goods, which had tended to crystallize during the years before the war, were broken open by the war-time changes. These goods still remained far below raw materials in their sensitiveness to changing market conditions, but the degree of their flexibility, as measured by the present index numbers, was very much higher between 1914 and 1921 than it had been during the 15 years preceding. In the survey of subsequent changes it will be of

interest to determine whether these prices again crystallized after the wave of war-time price changes had passed.

Price Movements of Products of American Farms and Other Products

The period we are now studying brought a revolutionary alteration in the economic status of the American farmer. He was favored at first by the price advance of the war years, but the subsequent liquidation carried him to a lower economic level than he had known for many years. The fortunes of agricultural and other producers during these years are reflected in the movements of the index numbers of purchasing power changes given in the accompanying table. (Purchasing power here refers to command over goods in general in wholesale markets. Deflation, in other words, is based upon an index of commodity prices at wholesale.)[1]

TABLE 87

PRODUCTS OF AMERICAN FARMS AND ALL OTHER PRODUCTS

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922[a]

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	Products of American farms		All other products		All products of American farms	All other products
	Raw	Processed	Raw	Processed		
1913	100.0	100.0	100.0	100.0	100.0	100.0
1914	104.3	102.3	94.4	97.3	103.1	96.5
1915	104.0	99.9	97.2	98.8	101.4	98.3
1916	97.1	94.5	102.3	105.6	95.5	104.8
1917	106.3	100.6	95.2	97.6	102.7	97.2
1918	105.4	107.4	84.2	96.7	106.7	93.7
1919	109.1	110.6	79.4	94.4	110.0	90.8
1920	93.2	106.1	81.9	104.2	101.2	98.6
1921	82.4	103.5	83.9	111.7	95.2	104.7
1922	92.3	102.1	85.9	106.2	98.3	101.3

[a] The number of price series in each group in 1922 is given below:

Products of American farms		All other products	
Raw	83	Raw	53
Processed	143	Processed	187
Total	226	Total	240

[1] The index numbers in the text are given in terms of purchasing power, since the significance of the changes shown is more readily apparent in this form. Corresponding index numbers, in current dollars, appear in Appendix III.

Index numbers relating to the two major groups are shown graphically in Figure 38.

The year 1919 marked the peak of values of farm products, in both raw and processed forms. The per-unit purchasing power of farm products, at wholesale, was approximately 10 per cent higher in that year than in 1913, while the purchasing power of non-farm products was about the same degree below the 1913 level. Liquidation brought a complete reversal of these relations. At average prices in 1921 the purchasing power of raw farm products was 18 per cent below the level of 1913 values. Raw non-farm products stood at a level almost as low. Processed farm products had a per-unit value some 3 per cent higher than in 1913, while the purchasing power of processed non-farm products had advanced almost 12 per cent. This latter group gained the most substantial advantage from the price shifts of liquidation.

The degree of disturbance of pre-war relations was lessened by 1922, but the positions of the indexes in that year still reflect significant departures from earlier relations. Farm products as a group were worth less than in 1913, while non-farm products had higher real values. In each group raw materials stand at the lower level, while products of manufacture show relatively improved economic position.[1]

§ *Prices and purchasing power of agricultural products at the farm.* —Index numbers of wholesale prices do not, of course, measure changes in the amounts received by farmers for their products or in the amounts

[1] We have noted that for commodities in general the developments of the war years enhanced the degree of variability of the prices of individual commodities. This is true also of the commodities in the groups defined above.

Comparison of Measurements of Monthly Variability
1898-1913, 1914-1921

Commodity group	Number of price series	Measurement of monthly variability 1898-1913	1914-1921
Products of American farms			
Raw	24	9.0	12.5
Processed	83	3.7	8.2
Total	107	4.9	9.1
All other products			
Raw	25	5.4	9.4
Processed	75	3.4	6.6
Total	100	3.9	7.3

The relations among groups in respect of susceptibility to price changes were not altered by the war-time movements, but in all groups there was a notable increase in the degree of price fluctuation. These measurements indicate profound alterations in the ordinary operations of business; they give evidence of the introduction of severe disturbances into the processes of buying and selling.

which they must pay for commodities bought. The United States Bureau of Agricultural Economics has constructed comprehensive index numbers of prices actually received by farmers and of prices paid by farmers for articles used in living and production.[1] The ratio between these two indicates, more accurately than does the purchasing power index presented above, the actual changes occurring in the command of agricultural producers over the commodities they require.

TABLE 88.

SHOWING CHANGES IN PRICES RECEIVED BY FARMERS, IN PRICES PAID BY FARMERS AND IN THE PURCHASING POWER OF FARM PRODUCTS, 1913-1922

(1) Year	(2) Index numbers of farm prices	(3) Prices paid by farmers for commodities bought	(4) Ratio of prices received to prices paid (in relative form)
1913	100	100	100
1914	102	101	101
1915	100	106	95
1916	117	123	95
1917	176	150	118
1918	200	178	112
1919	209	205	102
1920	205	206	99
1921	116	156	75
1922	124	152	81

The farmer's relative position was not materially improved by high prices until 1917, when the purchasing power of the average unit of American farm products was some 18 per cent higher than in 1913. In 1919 and 1920 buying prices went up for the farmer; by 1920 he had lost all the advantage he had enjoyed during the two closing years of the war. The drop in 1921 carried him far below his pre-war levels. By 1922 the farmer was selling and buying under conditions such that each unit of product was worth about 19 per cent less than in 1913, in terms of goods a farmer needs. This is a somewhat darker, but truer, picture than that presented by the index numbers of wholesale prices.[2]

[1] U. S. Department of Agriculture, *Yearbook of Agriculture, 1930*, pp. 995, 996.

[2] These measurements, of course, define purchasing power per unit of product. The farmer's actual position is more accurately shown by measurements of aggregate purchasing power, for changing yields are important factors in the farmer's economic situation. Estimates of gross farm income made by the Bureau of Agricultural Economics indicate that the aggregate purchasing power of farmers in 1922 was about six per cent less than the aggregate purchasing power of farmers in 1913. Relatively high yields in 1922 furnished partial compensation for the loss in per-unit purchasing power.

Materials presented in preceding sections of this chapter help to explain some of the price movements with which we have just been dealing. Index numbers of production of farm products, after attaining a high level in 1915, remained below corresponding indexes for raw non-farm products during the three succeeding years. These were years of strong demand and the result was a highly favorable price situation for farmers. In 1919 and 1920 the output of raw farm products was carried to relatively high levels. There was some decline in production in 1921, but 1922 again was marked by heavy output of farm products. Here is an obvious explanation of the price and purchasing power changes we have just been discussing. The business recession in 1920-21, combined with the shifts which accompanied the ending of the war, brought a sharp drop in the demand for farm products, as it did, in greater or less degree, in the demand for all products. In contrast to the sharp decline in the production of non-farm products, particularly processed non-farm products, there was no prompt adaptation on the part of farmers to this change in conditions. From 1920 to 1921 the output of processed non-farm products decreased approximately 27 per cent as compared with a drop of 10 per cent in the output of raw farm products. This prompt adaptation on the part of producers of processed non-farm products to changed economic conditions meant, of course, sudden and violent liquidation and retrenchment, involving unemployment and, in many cases, financial reorganization. It did, however, lessen the severity of the price drop and left manufacturing interests with enhanced purchasing power per unit of product. Deferred liquidation on the part of agricultural interests, and failure to adjust output to new demand conditions, brought price weakness which has persisted to this day.

Price Movements of Farm Crops, Animal Products, Mineral Products and Forest Products

From the turn of the century to the beginning of the war a progressive and persistent change was taking place in the price relations of various animal and mineral products and of farm crops. The real value of forest products was rising steadily, as was also that of animal products. Farm crops were about holding their own, while the real value, per unit, of mineral products was steadily dropping. The story of price changes among these groups during

the troubled war years and the years which followed is somewhat different. Index numbers of purchasing power changes for commodities of these four classes are shown in the next table.[1]

TABLE 89

FARM CROPS, ANIMAL PRODUCTS, MINERAL PRODUCTS AND FOREST PRODUCTS

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922 [a]

Year	Farm crops	Animal products	Mineral products	Forest products
1913	100.0	100.0	100.0	100.0
1914	103.0	101.8	96.5	97.1
1915	101.0	99.2	102.5	90.4
1916	95.2	93.9	114.6	87.0
1917	104.3	96.5	106.1	80.5
1918	107.9	101.0	99.9	79.8
1919	110.2	106.5	90.5	92.8
1920	104.2	93.5	97.8	117.2
1921	93.2	92.1	112.0	102.3
1922	95.8	96.4	105.1	105.3

[a] The number of price series in each group in 1922 is given below. (Nine price series included in the all commodities index have been omitted from these averages because of difficulty of classification.)

Farm crops	124
Animal products	122
Mineral products	158
Forest products	53

The war carried the prices of mineral products and farm crops to high levels, and the index numbers of per-unit purchasing power are correspondingly elevated. Forest products lagged behind, losing substantially in purchasing power. This loss was more than made up in 1920, when such products stood at a far higher level of real value than the commodities in any of the other groups. In 1922 forest products and mineral products had a higher per-unit purchasing power than in 1913, while the real values, per unit, of animal products and farm crops were appreciably lower. Comparing the period as a whole with the pre-war period, the most notable changes are found in the enhanced purchasing power of mineral products and the loss in purchasing power of animal products. Mineral products, which had been materially cheapened during the thirteen years before the war, possessed, in 1922, a per-unit purchasing

[1] The index numbers in the text are given in terms of purchasing power, since the significance of the changes shown is more readily apparent in this form. Corresponding index numbers, in current dollars, appear in Appendix III.

power more than 5 per cent greater than in 1913. We have here another of the revolutionary shifts brought by the recession of 1920-21, a shift which had enduring effects on developments during the succeeding years. Sellers of mineral products, who probably had most to gain from the improved productive efficiency which the post-war years were to bring, were exceptionally favored also in that the post-war readjustment left them in an exceedingly strong position in commodity markets.[1]

Price Movements of Foods and Non-foods

The effect of the economic changes occurring from 1901 to 1913 was to enhance the purchasing power of foods, particularly of raw foods, and to lower that of non-foods, particularly of raw non-foods. In Table 90, on page 214, a similar comparison for the war years is presented.[2]

With minor exceptions during two or three years, non-foods gained in purchasing power over the period here under review, while foods lost. In 1922, non-foods had a purchasing power some 5 per cent greater than in 1913; that of foods was 9 per cent less. Here we have another reversal of tendencies prevailing during pre-war years. In both major groups we find that raw materials suffered the greater loss in purchasing power between 1913 and 1922. Processed non-foods were the only group to show a net advance in real value per unit during this nine-year period.[3] This group, it

[1] Among these groups, as among the others previously discussed, prices which had formerly been stabilized and prices which had formerly been lethargic were stimulated into new activity by the changes of this disturbed epoch. A comparison of measures of variability and of frequency of price change during the periods 1898-1913 and 1914-1921 follows:

Commodity group	Number of price series	Monthly variability of prices		Frequency of price change	
		1898-1913	1914-1921	1898-1913	1914-1921
Farm crops	69	4.9	9.9	.52	.62
Animal products	46	5.1	8.3	.59	.69
Forest products	20	3.9	7.5	.32	.45
Mineral products	63	3.7	6.9	.36	.43

Prices of farm products remain the most variable of all those compared, while the frequency of price change remains highest for animal products. All the measurements show a very considerable increase in the magnitude of price changes and in the frequency of price alterations. The crust of custom was broken in the field of prices as it had not been for many years.

[2] The index numbers in the text are given in purchasing power terms. Corresponding index numbers, in current dollars, appear in Appendix III.

[3] Automobiles, which constitute a distinctive class of commodities in respect of price movements during these years, are not included in the present index numbers.

TABLE 90

FOODS AND NON-FOODS

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922 [a]

(1) Year	(2) (3) Foods		(4) (5) Non-foods		(6) All foods	(7) All non-foods
	Raw	Processed	Raw	Processed		
1913	100.0	100.0	100.0	100.0	100.0	100.0
1914	105.0	103.9	95.6	98.0	104.3	97.6
1915	101.5	101.4	101.2	98.5	101.4	99.1
1916	94.5	90.5	104.6	104.6	92.2	104.6
1917	98.3	96.6	105.6	100.1	97.3	101.5
1918	96.5	100.1	96.5	102.0	98.5	100.9
1919	103.7	102.9	88.9	100.9	103.2	98.2
1920	89.8	91.2	87.2	111.2	90.6	105.6
1921	84.1	95.6	81.5	113.5	90.2	105.6
1922	87.6	93.7	92.0	109.0	90.9	105.2

[a] The number of price series in each group in 1922 is given below:

Foods		Non-foods	
Raw	71	Raw	65
Processed	90	Processed	240
Total	161	Total	305

should be remembered, declined approximately 2 per cent in per-unit purchasing power between 1901 and 1913, a figure which stands in contrast to the net gain of 9 per cent between 1913 and 1922. Here, again, we have a group of products for which, presumably, costs of production had been most heavily reduced as a result of technical improvements and changes in production methods during the pre-war years, and which was left in an extremely strong economic position by the recession of the high tide of prices in 1921. This group, moreover, stood to gain most if the technical advance characteristic of pre-war years were to be resumed. In the study of the changes occurring during the following years this condition must be borne in mind.

Price Movements of Producers' Goods and Consumers' Goods

We have seen that the prices of goods in shape for final consumption show characteristic modes of behavior which differ from those of commodities destined for use as capital equipment or subject to further processing. The index numbers in the following table

show changes in the purchasing power of these two classes of goods and of various sub-divisions of each during the period now under review.[1] A graphic representation of certain of these measurements is given in Figure 38.

TABLE 91

PRODUCERS' GOODS AND CONSUMERS' GOODS

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922[a]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Producers' goods				Consumers' goods					
Year	Raw	Processed	Foods	Non-foods	Raw	Processed	Foods	Non-foods	All producers' goods	All consumers' goods
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1914	99.6	97.1	105.2	96.2	103.7	102.3	103.9	100.7	98.1	102.6
1915	104.7	99.5	107.4	100.0	91.6	99.0	98.5	96.6	101.6	97.8
1916	99.8	112.2	96.7	110.2	89.5	90.2	90.0	90.2	107.4	90.2
1917	104.8	105.3	100.6	106.5	91.6	92.8	95.7	88.1	105.2	92.6
1918	99.1	103.1	100.5	101.9	87.9	99.5	97.4	97.3	101.6	97.4
1919	96.0	99.9	107.3	96.4	97.1	103.2	101.2	103.3	98.4	102.1
1920	88.2	107.5	90.0	102.3	89.5	102.5	90.9	115.1	99.7	100.2
1921	78.2	106.9	77.8	99.7	101.0	109.4	97.3	125.0	95.0	107.9
1922	85.8	104.4	82.3	100.9	103.8	104.4	95.6	117.9	97.0	104.4

[a] The number of price series in each group in 1922 is given below:

Producers' goods		Consumers' goods	
Raw	105	Raw	31
Processed	179	Processed	151
Foods	54	Foods	107
Non-foods	230	Non-foods	75
Total	284	Total	182

Comparing first the entries in columns (10) and (11), it is to be noted that during the early years of the war the purchasing power of producers' goods was enhanced, while consumers' goods were cheapened. This reflects, presumably, the bidding of manufacturers for supplies to meet the war-time demand. Beginning with 1918 this situation was reversed. The recession of 1921 carried producers' goods to a level of real value approximately 5 per cent below that of 1913. Consumers' goods were worth, in terms of commodities, some 8 per cent more than in 1913. This margin was narrowed in 1922, but a major discrepancy still persisted. The era

[1] The index numbers in the text are given in terms of purchasing power. Corresponding index numbers, in current dollars, appear in Appendix III.

extending from 1922 to 1929, which we shall later subject to a detailed scrutiny, opens with producers' goods low-priced and consumers' goods high-priced, with reference to pre-war standards. This represents, of course, a favorable situation for those who buy in the markets for producers' goods and sell in the markets for consumers' goods.

The division of each of these groups into raw and processed categories [see columns (2), (3), (6) and (7)] reveals that both raw and processed producers' goods were carried to high levels of purchasing power by war-time demand, notably in 1917, but that raw producers' goods suffered most severely during the post-war deflation. In 1922 such goods had a real value, per unit, 14 per cent lower than in 1913. The other three groups of this division stood at higher levels in 1922 than in 1913.

Cutting across the categories of producers' and consumers' goods in another direction, we separate foods from non-foods. These index numbers [shown in columns (4), (5), (8) and (9)] reveal how quickly the wheel of fortune turned upon itself for producers of these several types of goods. The year 1916 finds non-foods among producers' goods with a purchasing power per unit 10 per cent higher than in 1913, while non-foods among consumers' goods stood 10 per cent below the earlier level. The shift in demand brought by the end of the war and the cataclysmic reversals accompanying the 1920-21 recession materially enhanced the purchasing power of consumers' non-foods. In 1921 the average purchasing power of goods in this class was approximately 25 per cent higher than in 1913. Producers' non-foods were then slightly below the 1913 level while food products in the producers' goods group were some 22 per cent lower in value than in 1913. These inequalities were reduced somewhat by 1922 but the range of difference, with reference to pre-war standards, was still pronounced. Most depressed were the real values of foods not yet in shape for final consumption (i.e., in the producers' goods class), while the purchasing power of non-foods in shape for sale to final consumers was approximately 18 per cent above the 1913 level.

In tracing price changes it is of interest to employ yet another grouping, differing slightly from that shown above. Articles of capital equipment classified among producers' goods have no counterpart among consumers' goods while, on the other hand, raw consumers' goods, which do not, of course, undergo fabrication

before consumption, have no counterpart in the producers' goods group. If we form a new class composed of producers' goods destined for human consumption we shall have a group which may be set against processed consumers' goods. This does not mean that precisely identical commodities, at different stages of manufacture, are contained in these two groups. But we do have here representatives of two different stages along the path followed by goods in the course of their fabrication and distribution. Index numbers for these two groups, in purchasing power form, appear in the next table.[1] They are plotted in Figure 39.

TABLE 92

PRODUCERS' GOODS DESTINED FOR HUMAN CONSUMPTION AND PROCESSED CONSUMERS' GOODS

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922[a]

Year	Producers' goods destined for human consumption	Processed consumers' goods
1913	100	100
1914	101	102
1915	105	99
1916	110	90
1917	108	93
1918	108	99
1919	104	103
1920	96	102
1921	82	109
1922	88	104

[a] The numbers of price series in these groups in 1922 are as follows:

Producers' goods destined for human consumption	132
Processed consumers' goods	151

In 1916, when war-time demand had attained full dimensions, producers' goods destined for ultimate consumption had an average real value, in terms of commodities in general, 10 per cent higher than they had enjoyed three years before, while processed consumers' goods had lost 10 per cent of their per-unit purchasing power. The recession of 1921 carried goods of the first class 18 per cent below the pre-war level, while processed consumers' goods had a per-unit purchasing power 9 per cent higher than in 1913. By 1922 the loss of the first group had been reduced to 12 per cent, while the gain for the second group had been reduced to 4 per cent.

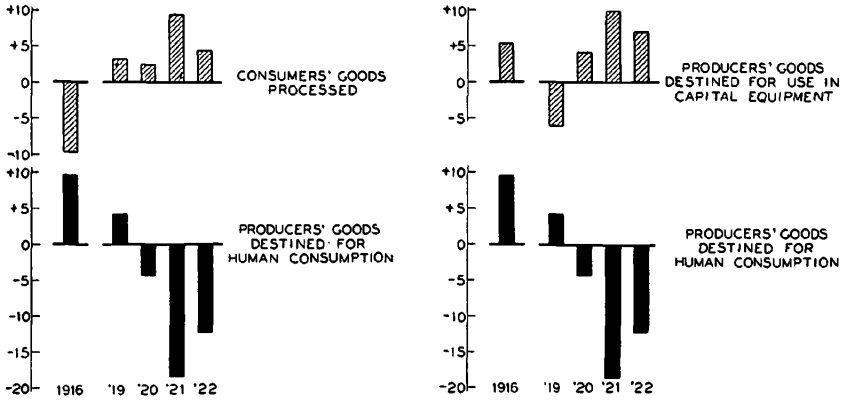
[1] Index numbers in current dollars appear in Appendix III.

FIGURE 39

GRAPHIC REPRESENTATION OF CHANGES IN THE REAL VALUES, PER UNIT, OF COMMODITIES IN SELECTED GROUPS, 1913-1922

SELECTED CLASSES OF PRODUCERS' GOODS AND CONSUMERS' GOODS

(CHANGES ARE MEASURED AS PERCENTAGE DEVIATIONS FROM 1913 PURCHASING POWER.)



The post-war advance which was begun in 1922 starts, then, with an extremely wide margin between the respective purchasing powers of these two important classes of goods. Commodities intended for consumption, but requiring further fabrication before their ultimate sale to consumers, were selling at very low prices, while the prices paid by ultimate consumers for goods in their final form were well above pre-war levels. Here, obviously, was a situation which worked to the distinct advantage of fabricating agents. The prices at which they bought were low, the prices at which they sold were high. The manner in which this margin of advantage was utilized, and the degree to which the different agents of fabrication —employees, management and ownership—reaped the rewards of this advantageous condition remain to be discussed. It is clear at this stage, however, that fabricating agents were in a position of economic advantage such as they had not enjoyed for many years. (This advantage could not, of course, become a real one under conditions of acute depression. Favorable price margins mean nothing unless goods are being sold in sufficient quantities. But once the volume of sales picks up after depression, the full benefits of such price margins may be realized.)

One further classification of producers' goods is to be made. As we have seen, producers' goods intended for human consumption were greatly lowered in real value by the events which accompanied the recession of 1920-21. Was the same thing true of producers' goods intended for ultimate use as capital equipment? The following table permits an answer to this question.[1] The measurements are shown graphically in Figure 39.

TABLE 93

PRODUCERS' GOODS DESTINED FOR HUMAN CONSUMPTION AND FOR USE IN CAPITAL EQUIPMENT

Index Numbers of Purchasing Power, in Wholesale Markets, 1913-1922[a]

Year	Producers' goods destined for human consumption	Producers' goods destined for use in capital equipment
1913	100	100
1914	101	95
1915	105	98
1916	110	105
1917	108	103
1918	108	97
1919	104	94
1920	96	104
1921	82	110
1922	88	107

[a] The numbers of price series in these groups in 1922 are as follows:

Producers' goods destined for human consumption	132
Producers' goods destined for use in capital equipment	152

The end of the war in 1918 found articles of capital equipment undervalued, in relation to the 1913 standard. The net effect of recession and of post-war revival was to carry their prices upward; by 1922 goods of this class had a purchasing power, in terms of goods in general, 7 per cent higher than in 1913. It was not all producers' goods, therefore, which were cheapened by the great post-war recession. In improving and extending his capital equipment the producer was forced to pay much higher prices, with reference to pre-war standards, than was necessary in buying materials for fabrication into consumers' goods. The manufacturer's distinct price advantage was restricted to goods of the latter class.

[1] Index numbers in current dollars are given in Appendix III.

Changes in Prices and Costs in Manufacturing Industries, 1914-1923

It is possible to trace in greater detail certain changes occurring in selling prices and costs of fabrication among manufacturing industries. The basic data for a list of selected industries, for which comparable statistics on production, cost of materials, wages, etc., are available, appear in the following table.

TABLE 94

Statistics of Selected Manufacturing Industries in the United States, 1914-1923 [a]

(All value figures in thousands of dollars)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Statistics relating to all products of industries represented in index of physical volume of production					Actual value of products entering into index of physical volume of production	Ratio of value of products entering into index to total value of products (7)/(2)
Year	Total value of products	Cost of materials	Cost of fabrication, plus profits	Total wages paid	Overhead expenses plus profits		
1914	9,306,464	6,558,680	2,747,784	1,188,443	1,559,341	8,364,314	.899
1919	24,887,795	17,368,936	7,518,859	3,122,521	4,396,338	22,220,996	.893
1921	15,956,026	10,876,326	5,079,700	2,384,286	2,695,414	14,312,703	.897
1923	23,170,088	15,384,586	7,785,502	3,433,701	4,351,801	21,010,915	.907

[a] The data for all years represented in this table relate to establishments reporting products of a value of $5,000 or more.

The products of the industries entering into this table constitute from 44 to 47 per cent, by value, of total products of all manufacturing industries; the sample with which we are working is a broad one.

If we reduce to relative numbers certain of the entries in the above table, we have the series appearing in Table 95. An index of physical volume of manufacturing production, based upon the output of the selected industries, is also given in this table. Having measurements of this type, relating to aggregate values and to quantities for identical industries, we are able to measure changes in selling price, per unit of product, and in the various elements of manufacturing cost, per unit of product.

TABLE 95

RELATIVE NUMBERS DEFINING CHANGES IN IMPORTANT ELEMENTS OF MANUFACTURING PRODUCTION IN THE UNITED STATES, 1914-1923

(1) Year	(2) Physical volume of production (fabrication)	(3) Value of products	(4) Cost of materials	(5) Cost of fabrication, plus profits	(6) Total wages paid	(7) Overhead expenses plus profits
1914	100.0	100.0	100.0	100.0	100.0	100.0
1919	127.7	267.4	264.8	273.6	262.7	281.9
1921	105.7	171.4	165.8	184.8	200.6	172.9
1923	156.3	249.0	234.6	283.3	288.9	279.1

§ *On changes in the apparent physical contributions of different agents of manufacturing production, 1914-1923.*—As was explained in Chapter III, it is necessary, in securing accurate measurements of changes in different cost elements, to employ different index numbers of physical volume of manufacturing production. The index numbers given in Table 95, which measure changes in the volume of fabrication, are not necessarily identical with index numbers measuring changes in the aggregate volume of output of manufacturing industries. For changes occur in the degree of fabrication in different industries, and industries in which raw materials undergo varying degrees of fabrication change in relative importance. Still other index numbers are necessary for measuring changes in the physical contributions of

TABLE 96

INDEX NUMBERS MEASURING CHANGES IN THE APPARENT PHYSICAL CONTRIBUTIONS OF DIFFERENT AGENTS OF MANUFACTURING PRODUCTION, 1914-1923

(1) Year	(2) Aggregate output (weights based on value of product)	(3) Volume of materials (weights based on cost of materials)	(4) Volume of fabrication (weights based on 'value added')	(5) Apparent contribution of labor (weights based on wages paid)	(6) Apparent contribution of ownership and management (weights based on overhead expenses plus profits)
1914	100.0	100.0	100.0	100.0	100.0
1919	126.3	125.6	127.7	124.6	130.2
1921	103.3	102.2	105.7	101.4	109.1
1923	149.0	145.7	156.3	154.6	157.7

labor and of the other agents of fabrication. The various index numbers relating to volume of manufacturing production are summarized, for reference, in Table 96. (These do not purport, of course, to measure the specific contributions of the several productive agents.)

The elements involved in deriving index numbers of selling price, per unit of product, are shown in the next table.

TABLE 97

INDEX NUMBERS OF AGGREGATE VALUE, PRODUCTION AND PRICE, 1914-1923

Manufacturing Industries of the United States

Year	Aggregate value of manufactured product	Physical volume of output [a]	Average selling price per unit, products of manufacture
1914	100.0	100.0	100.0
1919	267.4	126.3	211.8
1921	171.4	103.3	166.0
1923	249.0	149.0	167.1

[a] Weights based on value of product.

The changes in volume of manufacturing production during the war-time advance, the recession in 1921 and the sharp rise thereafter, have been discussed. During the first five-year period selling price changes greatly overshadowed volume changes in swelling the total value of manufactured products. During the decline from 1919 to 1921 volume and prices fell by amounts which did not differ greatly. (Production declined 18 per cent, prices 22 per cent.) Thereafter, however, volume increased rapidly, while the great revival from 1921 to 1923 brought practically no change in the average selling price, per unit of product, of manufactured goods.[1]

[1] The index numbers of selling prices, given in Table 97, which are derived from statistics of aggregate values and quantities, and not from price quotations on individual commodities, may be compared with index numbers derived from such individual quotations. If we shift to the 1914 base the index numbers of wholesale prices of manufactured goods which were given in Table 85, adding a figure for 1923, we have the following measurements:

1914	100.0
1919	210.7
1921	166.4
1923	166.7

The degree of correspondence is very close, in view of the complete independence of the methods of computation.

§ *Selling prices, individual industries.*—We have already remarked upon the undesirability of trusting to general index numbers alone in tracing the diversified changes characteristic of manufacturing industries. At times the degree of diversity is so pronounced that an average is misleading. In the following table are brought together index numbers defining price movements in individual manufacturing industries between 1914 and 1923.

TABLE 98

CHANGES IN THE SELLING PRICES OF PRODUCTS OF MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of selling price, per unit of product			
	1914	1919	1921	1923
Hats, wool-felt	100.0	250.3	291.5	356.8
Lime	100.0	229.9	275.7	266.5
Musical instruments: organs	100.0	128.2	199.3	260.0
Coke, not including gas-house coke	100.0	225.4	228.0	253.7
Lace goods, cotton	100.0	250.2	255.1	240.6
Knit goods	100.0	242.7	224.0	235.9
Worsted goods	100.0	288.1	212.5	234.9
Lumber and timber products	100.0	215.8	169.5	230.4
Cast-iron pipe	100.0	269.0	214.3	229.9
Wood distillation and charcoal manufacture	100.0	261.2	180.0	229.1
Cars, steam and electric railroad, not built in railroad repair shops	100.0	256.0	285.0	223.9
Woolen goods	100.0	287.4	201.1	222.9
Cotton goods	100.0	293.9	191.9	220.5
Oilcloth	100.0	311.1	219.6	217.4
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	211.6	201.6	207.8
Cement	100.0	184.9	204.7	205.1
Oil, cake, and meal, cottonseed	100.0	329.9	170.1	204.1
Sugar, cane, not including products of refineries	100.0	279.4	115.6	199.5
Carpets and rugs, wool, other than rag	100.0	206.3	179.9	199.2
Clay products (other than pottery) and non-clay refractories	100.0	204.2	199.7	197.7
Hats, fur-felt	100.0	215.2	159.4	197.3
Jute and linen goods	100.0	228.7	199.9	193.2
Silk manufactures	100.0	203.9	189.4	193.2
Sugar refining, cane	100.0	238.1	142.7	189.4
Sugar, beet	100.0	243.0	158.5	189.3
Sand-lime brick	100.0	189.2	212.9	189.0
Paper and wood pulp	100.0	198.5	198.2	185.8
Iron and steel: steel works and rolling mills	100.0	211.2	183.9	184.3

TABLE 98—*Continued*

Industry	Index numbers of selling price, per unit of product			
	1914	1919	1921	1923
Wool shoddy	100.0	253.4	157.3	183.7
Iron and steel: blast furnaces	100.0	191.5	182.8	182.5
Salt	100.0	188.1	232.1	182.3
Paints and varnishes	100.0	183.7	176.1	175.4
Wire, drawn from purchased bars or rods	100.0	188.0	218.6	174.7
Soap	100.0	194.9	163.7	163.1
Turpentine and rosin	100.0	369.9	119.4	159.8
Butter and cheese	100.0	202.5	137.7	157.7
Cordage and twine	100.0	241.9	166.2	156.2
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	193.1	176.2	156.0
Ice, manufactured	100.0	165.6	170.3	154.5
Linoleum and asphalted-felt-base floor coverings	100.0	159.2	148.8	153.5
Petroleum refining	100.0	211.5	188.5	142.9
Fertilizers	100.0	199.9	171.7	137.1
Motorcycles, bicycles, and parts	100.0	160.6	153.1	135.8
Gas, manufactured, illuminating and heating	100.0	110.5	145.6	134.2
Condensed and evaporated milk	100.0	209.8	134.6	134.1
Explosives	100.0	176.8	162.2	132.1
Musical instruments: pianos	100.0	132.6	140.2	128.0
Flour and other grain-mill products	100.0	222.1	148.5	124.9
Rice cleaning and polishing	100.0	244.1	105.3	119.0
Slaughtering and meat packing, wholesale	100.0	195.2	122.3	114.0
Motor vehicles, including bodies and parts	100.0	116.2	109.0	98.7
Rubber products	100.0	132.0	107.2	86.3
Average [a]	100.0	208.4	175.1	182.2

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on value of product, averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

Detailed consideration of the price changes occurring in these industries is not necessary. It is significant that the averages given at the foot of this table differ in certain respects from the index numbers of selling prices in Table 97. Heavily weighted industries with exceptional price movements, notably meat packing in 1921 and 1923, exert a very strong influence upon a mathematical average of the type of the 'ideal' index. This is desirable for certain purposes, but it may give results which are not typical of manufacturing industries in general. The averages at the foot of Table 98, which are probably more representative of the fortunes of typical manufacturing industries than are those previously presented, indicate a slightly lower level of selling prices in 1919, a somewhat higher level in 1921 and 1923.

The present procedure permits the derivation of measurements of cost of materials, per unit of product, and of fabrication costs, plus profits, per unit of product. These several index numbers, expressed first in current dollars and then in dollars of constant purchasing power in wholesale markets, appear in the next table. Figure 40 presents a graphic portrayal of the changes in these costs.[1]

TABLE 99

CHANGES IN SELLING PRICE, COST OF MATERIALS AND FABRICATION COSTS, PLUS PROFITS, 1914-1923

Manufacturing Industries of the United States

(All measurements relate to changes per unit of product)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	In current dollars			In dollars of constant purchasing power		
Year	Selling price	Cost of materials	Fabrication costs, plus profits	Selling price	Cost of materials	Fabrication costs, plus profits
1914	100.0	100.0	100.0	100.0	100.0	100.0
1919	211.8	210.8	214.2	104.1	103.6	105.2
1921	166.0	162.2	174.9	115.8	113.2	122.0
1923	167.1	161.0	181.2	113.1	109.0	122.7

The great rise in prices of manufactured goods between 1914 and 1919 reflected rising material costs and rising fabrication costs in almost equal degree. In the ensuing drop of 1921 costs of materials fell to lower levels, relatively, than did fabrication costs. During the two years of revival following 1921, a revival which increased the total physical output of manufacturing industries by 48 per cent, material costs dropped fractionally, while fabrication costs, plus profits, per unit of product advanced almost 4 per cent.

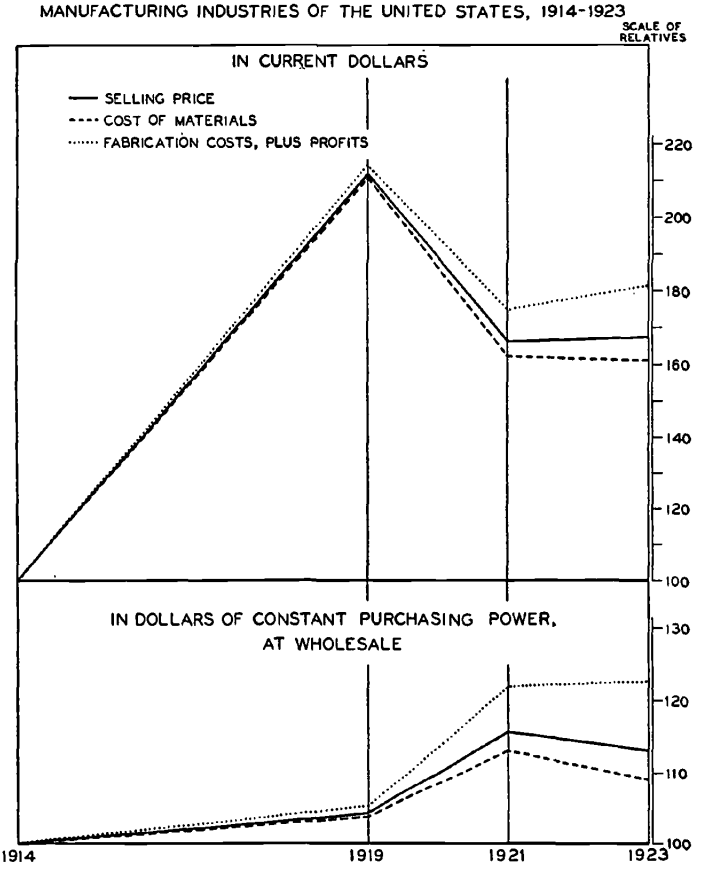
The picture is clearer if we trace the changes in dollars of constant purchasing power. Here we may see manufacturing industries as a whole, and the two elements distinguished above, against the background of general market changes. As already observed, the

[1] Reduction to dollars of constant purchasing power has been effected through division by the wholesale price index of the U. S. Bureau of Labor Statistics. Since this is not a perfect deflator in the present case, attention should be paid to the relative movements of the different index numbers, rather than to absolute figures.

FIGURE 40

CHANGES IN AVERAGE SELLING PRICE, COST OF MATERIALS AND FABRICATION COSTS, PLUS PROFITS, PER UNIT OF PRODUCT

MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923



effect of war-time and post-war developments was to reverse the trend toward steadily cheapening manufactured goods which had prevailed before the war. The purchasing power of manufactured goods, per unit, stood very much higher in 1921 than in 1914, and this advantage was only slightly impaired by 1923. Sellers of materials (and these, it must be remembered, include not only sellers of raw materials proper, but sellers of semi-processed goods, fuel, supplies, etc., for use in manufacturing) gained also, though the index numbers relating to this group are lower throughout than those de-

fining selling price changes. It is fabrication costs which show the most pronounced divergence from their pre-war tendencies. These costs (in dollars of constant purchasing power) declined steadily from 1899 to 1914, being in 1914, 19.8 per cent lower, per unit of manufactured product, than in 1899. The record of changes after 1914 is one of unbroken advance. The liquidation of 1920-21 was much less severe for fabricating agents than for most other economic elements, and the net result was a very high level of real fabrication costs in 1921. These costs, which here include profits, rose fractionally during the remarkable spurt of activity between 1921 and 1923.

§ *Material costs and fabrication costs, individual industries.*—We shall do well at this point to note the diversity of cost movements among manufacturing industries between 1914 and 1923. Space considerations preclude extended comment, but the reader will find it enlightening to trace the changes in material costs and in fabrication costs among the manufacturing industries listed in the two following tables.

TABLE 100

CHANGES IN MATERIAL COSTS, MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of cost of materials, per unit of product			
	1914	1919	1921	1923
Hats, wool-felt	100.0	271.6	284.8	363.8
Lime	100.0	234.5	306.2	269.3
Coke, not including gas-house coke	100.0	229.2	249.6	249.4
Knit goods	100.0	256.4	224.7	237.6
Lace goods, cotton	100.0	259.0	258.7	228.8
Cars, steam and electric railroad, not built in railroad repair shops	100.0	250.8	262.8	227.0
Lumber and timber products	100.0	183.9	177.5	221.0
Silk manufactures	100.0	202.3	192.6	213.7
Worsted goods	100.0	277.6	170.9	213.7
Sand-lime brick	100.0	186.0	248.3	211.1
Oil, cake, and meal, cottonseed	100.0	329.5	178.9	208.7
Sugar, cane, not including products of refineries	100.0	289.6	115.6	208.6
Cotton goods	100.0	276.9	166.4	208.5
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	229.5	198.0	205.4
Wood distillation and charcoal manufacture	100.0	244.1	190.6	203.0

TABLE 100—*Continued*

Industry	Index numbers of cost of materials, per unit of product			
	1914	1919	1921	1923
Woolen goods	100.0	279.8	170.6	200.9
Hats, fur-felt	100.0	230.1	175.3	199.0
Sugar refining, cane	100.0	236.4	143.0	194.9
Clay products (other than pottery) and non-clay refractories	100.0	209.5	222.2	194.1
Cast-iron pipe	100.0	214.0	181.9	190.7
Iron and steel: steel works and rolling mills	100.0	195.1	193.9	185.8
Paper and wood pulp	100.0	183.4	206.4	183.0
Oilcloth	100.0	275.2	182.5	183.0
Salt	100.0	179.8	257.0	182.4
Iron and steel: blast furnaces	100.0	179.6	188.8	179.9
Musical instruments: organs	100.0	112.4	172.5	179.4
Paints and varnishes	100.0	192.9	181.1	177.9
Wire, drawn from purchased bars or rods	100.0	172.8	198.8	172.8
Sugar, beet	100.0	214.4	210.0	171.3
Wool shoddy	100.0	254.4	150.4	169.8
Gas, manufactured, illuminating and heating	100.0	151.9	205.7	163.7
Carpets and rugs, wool, other than rag	100.0	183.7	141.9	159.2
Turpentine and rosin	100.0	372.0	121.9	156.4
Motorcycles, bicycles, and parts	100.0	159.8	139.2	154.2
Butter and cheese	100.0	204.2	133.0	153.4
Cement	100.0	164.2	201.4	153.2
Ice, manufactured	100.0	176.6	187.2	149.4
Soap	100.0	211.2	147.5	147.4
Petroleum refining	100.0	197.1	183.8	138.4
Condensed and evaporated milk	100.0	216.8	125.2	137.0
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	190.8	172.8	136.5
Fertilizers	100.0	186.7	195.8	136.0
Musical instruments: pianos	100.0	145.2	158.8	134.6
Jute and linen goods	100.0	168.2	145.0	134.6
Cordage and twine	100.0	223.0	140.5	130.0
Flour and other grain-mill products	100.0	227.0	145.9	123.1
Motor vehicles, including bodies and parts	100.0	135.0	132.3	117.8
Rice cleaning and polishing	100.0	232.2	97.6	113.6
Explosives	100.0	141.9	135.8	112.5
Linoleum and asphalted-felt-base floor coverings	100.0	143.6	122.8	112.4
Slaughtering and meat packing, wholesale	100.0	199.2	118.9	109.9
Rubber products	100.0	127.2	106.0	83.3
Average [a]	100.0	200.6	163.3	174.1

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on cost of materials, averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

TABLE 101

CHANGES IN FABRICATION COSTS, PLUS PROFITS, MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of cost of fabrication, plus profits, per unit of profit			
	1914	1919	1921	1923
Oilcloth	100.0	470.3	384.0	370.2
Hats, wool-felt	100.0	228.5	298.4	349.7
Jute and linen goods	100.0	383.3	339.9	343.0
Musical instruments: organs	100.0	139.7	218.9	319.2
Cast-iron pipe	100.0	364.6	270.6	298.3
Wood distillation and charcoal manufacture	100.0	293.9	159.5	278.9
Worsted goods	100.0	308.7	294.4	276.7
Lime	100.0	226.7	254.3	264.6
Coke, not including gas-house coke	100.0	216.4	178.2	263.3
Carpets and rugs, wool, other than rag	100.0	241.9	239.7	262.3
Cement	100.0	206.5	208.1	259.4
Woolen goods	100.0	299.4	249.3	257.6
Lace goods, cotton	100.0	243.7	252.5	249.5
Cotton goods	100.0	323.7	236.6	241.4
Lumber and timber products	100.0	237.0	164.1	236.7
Knit goods	100.0	224.7	223.2	233.9
Cordage and twine	100.0	293.0	235.6	226.7
Linoleum and asphalted-felt-base floor coverings	100.0	186.9	195.1	226.4
Sugar, beet	100.0	298.8	58.0	224.3
Cars, steam and electric railroad, not built in railroad repair shops	100.0	266.6	331.1	217.3
Wool shoddy	100.0	251.4	172.5	214.5
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	182.5	207.5	211.6
Clay products (other than pottery) and non-clay refractories	100.0	201.7	189.2	199.4
Soap	100.0	157.6	200.7	198.9
Hats, fur-felt	100.0	202.7	146.3	195.9
Iron and steel: blast furnaces	100.0	250.7	153.1	195.1
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	197.8	182.9	194.1
Paper and wood pulp	100.0	225.5	183.7	190.8
Butter and cheese	100.0	190.5	171.9	189.2
Salt	100.0	194.7	212.0	182.1
Iron and steel: steel works and rolling mills	100.0	240.2	165.7	181.8
Wire, drawn from purchased bars or rods	100.0	221.5	262.1	179.0
Oil, cake, and meal, cottonseed	100.0	332.6	119.3	177.2
Sand-lime brick	100.0	190.8	193.5	177.0
Sugar, cane, not including products of refineries	100.0	250.6	115.6	174.1

TABLE 101—*Continued*

Industry	Index numbers of cost of fabrication, plus profits, per unit of profit			
	1914	1919	1921	1923
Paints and varnishes	100.0	169.5	168.4	171.7
Silk manufactures	100.0	206.0	185.1	166.1
Rice cleaning and polishing	100.0	345.6	171.0	164.8
Explosives	100.0	233.2	204.9	164.0
Petroleum refining	100.0	277.8	210.0	163.7
Turpentine and rosin	100.0	369.2	118.6	161.0
Ice, manufactured	100.0	161.0	163.3	156.6
Slaughtering and meat packing, wholesale	100.0	167.3	145.2	141.9
Fertilizers	100.0	231.5	114.1	139.8
Flour and other grain-mill products	100.0	192.3	164.5	136.1
Sugar refining, cane	100.0	256.4	139.9	132.3
Musical instruments: pianos	100.0	121.7	124.2	122.3
Condensed and evaporated milk	100.0	181.0	173.6	122.1
Gas, manufactured, illuminating and heating	100.0	89.6	113.4	118.4
Motorcycles, bicycles, and parts	100.0	161.3	166.6	118.1
Rubber products	100.0	137.6	108.5	89.8
Motor vehicles, including bodies and parts	100.0	100.9	90.1	83.2
Average [a]	100.0	230.2	175.9	187.6

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on 'value added', averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

The weighted averages at the foot of each of these tables, averages designed to measure changes in typical manufacturing industries, without giving excessive weight to the fortunes of exceptionally circumstanced industries, differ from the index numbers of costs which appear in Table 99. Material costs, per unit of product, are shown as somewhat lower in 1919, somewhat higher in 1923, than appears from the first set of index numbers. Fabrication costs appear to have been much higher in 1919 for the average manufacturing industry than the weighted index of all industries suggests. For the two later census years the differences are not great.

Changes in two major elements of fabrication costs—labor costs and a composite which includes overhead, salaries and profits—may be traced separately. Index numbers of these costs, which are given in the following table, are plotted in Figure 41.

Both elements of fabrication costs advanced rapidly between 1914 and 1919, but they diverged markedly during the two years following. In 1921 labor costs, per unit of product, were approxi-

TABLE 102

CHANGES IN TOTAL FABRICATION COSTS, LABOR COSTS AND OVERHEAD COSTS PLUS PROFITS, 1914-1923

Manufacturing Industries of the United States

(All measurements relate to changes per unit of product)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	In current dollars			In dollars of constant purchasing power		
Year	Fabrication costs, plus profits	Labor costs	Overhead costs plus profits	Fabrication costs, plus profits	Labor costs	Overhead costs plus profits
1914	100.0	100.0	100.0	100.0	100.0	100.0
1919	214.2	210.8	216.4	105.2	103.6	106.3
1921	174.9	197.9	158.4	122.0	138.1	110.5
1923	181.2	186.9	176.9	122.7	126.5	119.8

mately 98 per cent higher than in 1914, while overhead costs plus profits, per unit of product, were only 58 per cent higher. The subsequent revival brought some reduction in labor costs but carried the composite of overhead costs and profits to a much higher level.

Here, again, index numbers expressed in dollars of constant purchasing power are perhaps more illuminating. In using these, we may think of the community as paying in goods for the services of the different productive agents. Between 1914 and 1919, there was an advance of about 5 per cent in the cost of the services of fabricating agents. The subsequent recession, in which wages suffered a smaller decline than those recorded for most other prices, brought a sharp increase in real labor costs, per unit of product. In 1921, these costs were 38 per cent above the 1914 level. The reduction in labor costs that followed the business advance from 1921 to 1923 left these costs still high, more than 26 per cent above the 1914 standard.[1]

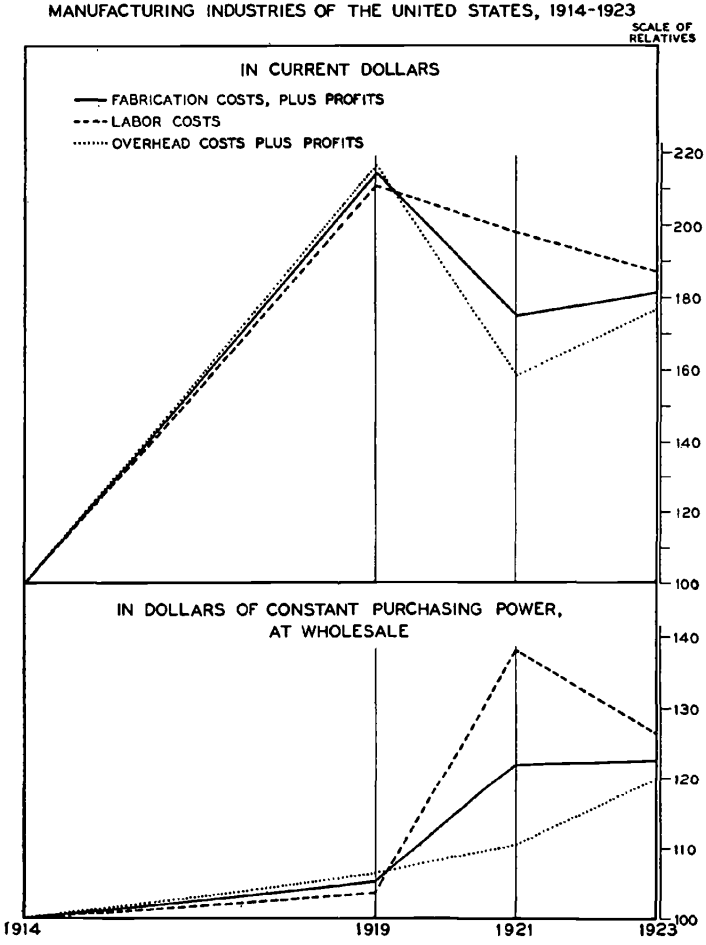
Overhead costs and profits show no such great advance as labor costs between 1914 and 1921. There was a substantial increase,

[1] When we speak of the community as paying in goods for the services of fabricating agents, we are referring to goods as priced in wholesale markets. Changes in the real rewards of labor are not here in question, for labor's income is not spent in wholesale markets. Since manufactured goods are first disposed of in wholesale markets, however, it seems proper to measure changes in these various costs in terms of purchasing power at wholesale.

FIGURE 41

CHANGES IN AVERAGE FABRICATION COSTS, LABOR COSTS AND OVERHEAD COSTS PLUS PROFITS, PER UNIT OF PRODUCT

MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923



however, carrying overhead costs plus profits in 1921 to a level 10 per cent higher, in terms of dollars of constant purchasing power, than in 1914. Recovery in 1922 and 1923 advanced these costs (including profits) to a level about 20 per cent above that of 1914.[1]

[1] The advance in 'overhead costs plus profits' between 1914 and 1921 was due, in part, to increasing taxes during this period. Data published by the Bureau of the Census, supplemented by estimates based on compilations of the Bureau of

It is unfortunate that we cannot separate overhead costs and profits, for it is certain that during some of this period these two elements moved in different directions. In 1921 overhead costs proper were relatively high, per unit of product, while profits, per unit, were low. Increasing production from 1921 to 1923 probably lowered overhead costs, per unit, but brought distinctly higher profits, per unit of product.

It is of interest to compare the changes in production costs which were occurring during the fifteen years from 1899 to 1914 with those which took place from 1914 to 1923. During the decade and a half which preceded the war there was a substantial decline in both elements of fabrication costs, as measured in dollars of constant purchasing power. The community was giving progressively less, in terms of goods at wholesale, for the contributions of labor

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Internal Revenue, may be used in measuring changes in certain of the component elements of 'overhead costs plus profits'. The following percentages relate to all manufacturing industries in the United States.

Item of cost	Percentage of total 'overhead cost plus profits'			
	1914	1919	1921	1923
Taxes, total	7.6	14.3	9.2	7.5
Salaries	22.0	19.9	25.3	18.9
Payments for contract work	3.4	3.2	4.5	4.2
Elements other than taxes, salaries and contract work	67.0	62.6	61.0	69.4
Overhead costs plus profits, total	100.0	100.0	100.0	100.0

Payments for contract work constituted a fairly constant proportion of the total during this period. Salaries constituted a smaller proportion of all overhead costs plus profits during the prosperous years 1919 and 1923 than during the depressed years 1914 and 1921. The advance of this item in 1921 is particularly marked. Taxes almost doubled in relative importance between 1914 and 1919, and remained relatively high in 1921.

The index of overhead costs plus profits, per unit of product, reflects, of course, the increase in tax payments. If taxes be excluded from overhead costs plus profits, the index numbers in column (4) of Table 102 will be modified somewhat. A corrected index follows. This relates to costs in current dollars.

Year	Overhead costs plus profits per unit of product, manufacturing industries (excluding all taxes)
1914	100
1919	201
1921	156
1923	177

We are not dealing with accurately measurable quantities here, but the differences between the original and the revised measurements indicate the relative importance of war-time and post-war taxes, as factors in overhead costs. The elimination of taxes reduces the 1919 index of overhead costs plus profits, per unit of product, from 216 to 201. In subsequent years the differences between the original and the corrected measurements are slight.

and of management to each unit of manufactured goods. In 1914 real labor costs, per unit of product, were 16 per cent below the 1899 level, while the composite of overhead costs and profits was 22 per cent below that level. The steady cheapening of manufactured goods which was a characteristic tendency of the pre-war period was due, of course, to the declining unit cost of fabrication. We had come to think of this steady cheapening of manufactured goods as an invariable accompaniment of an increasing volume of fabrication and of improving technical methods. One of the most striking results of the changes which came with the economic revolution occurring between 1914 and 1923 was the reversal of this persistent pre-war tendency. The ability of fabricating agents to resist liquidation, their greater flexibility in the face of changed market conditions, and the weakness of raw material producers in the face of liquidation were factors in this reversal. This change involved a momentous shift in purchasing power, a major modification of the relations among important elements of our economic structure. It is a fact of very considerable importance that this change occurred and that, as a result, we entered upon the period of post-war expansion with manufacturing labor, management and ownership in such strong strategic positions.

§ *Labor costs and other fabrication costs, individual industries.*— Turning from the average changes in labor and overhead costs defined by the above index numbers to the detailed figures for individual industries, we again find wide differences. Labor costs and overhead costs, per unit of product, advanced sharply for certain industries and but slightly, or not at all, for others. The actual changes in all their diversity are shown by the measurements in the two following tables.

TABLE 103

CHANGES IN LABOR COSTS, MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of labor costs, per unit of product			
	1914	1919	1921	1923
Oilcloth	100.0	317.8	281.6	286.9
Hats, wool-felt	100.0	166.2	255.9	267.5
Worsted goods	100.0	222.3	241.6	243.1
Jute and linen goods	100.0	235.2	277.5	240.4

TABLE 103—*Continued*

Industry	Index numbers of labor costs, per unit of product			
	1914	1919	1921	1923
Cast-iron pipe	100.0	296.7	239.4	234.0
Lime	100.0	224.1	266.4	233.2
Woolen goods	100.0	225.0	235.0	229.3
Cordage and twine	100.0	227.8	243.7	229.0
Carpets and rugs, wool, other than rag	100.0	190.4	233.5	227.7
Musical instruments: organs	100.0	134.3	206.3	227.4
Lumber and timber products	100.0	232.8	181.3	226.0
Cars, steam and electric railroad, not built in railroad repair shops	100.0	177.4	277.8	224.0
Cement	100.0	195.9	193.5	215.9
Wood distillation and charcoal manufacture	100.0	274.9	227.7	213.4
Cotton goods	100.0	227.6	228.1	212.9
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	205.2	244.1	208.8
Lace goods, cotton	100.0	197.3	232.2	207.0
Knit goods	100.0	184.7	202.5	203.0
Wire, drawn from purchased bars or rods	100.0	252.1	289.1	197.3
Wool shoddy	100.0	210.4	212.2	196.5
Slaughtering and meat packing, wholesale	100.0	256.1	226.0	196.5
Soap	100.0	206.9	204.0	194.5
Paper and wood pulp	100.0	213.2	235.4	193.5
Sugar refining, cane	100.0	273.6	220.2	193.4
Salt	100.0	171.3	232.7	187.0
Paints and varnishes	100.0	186.4	214.3	185.9
Clay products (other than pottery) and non-clay refractories	100.0	190.9	189.3	183.4
Iron and steel: steel works and rolling mills	100.0	232.5	196.9	182.0
Flour and other grain-mill products	100.0	199.7	197.5	180.7
Fertilizers	100.0	262.8	222.4	178.7
Oil, cake, and meal, cottonseed	100.0	292.4	241.5	178.2
Sugar, cane, not including products of refineries	100.0	269.4	161.1	176.8
Turpentine and rosin	100.0	294.4	121.4	174.7
Hats, fur-felt	100.0	158.0	148.9	174.7
Silk manufactures	100.0	172.9	198.7	173.7
Sand-lime brick	100.0	177.8	195.9	170.6
Petroleum refining	100.0	237.6	228.0	169.0
Coke, not including gas-house coke	100.0	209.4	170.7	164.1
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	187.0	167.1	163.0
Motorcycles, bicycles, and parts	100.0	181.0	154.9	158.2
Sugar, beet	100.0	245.6	244.7	153.2
Butter and cheese	100.0	160.8	163.9	150.8
Iron and steel: blast furnaces	100.0	247.6	178.4	148.8
Explosives	100.0	220.9	167.4	148.3

TABLE 103—*Continued*

Industry	Index numbers of labor costs, per unit of product			
	1914	1919	1921	1923
Gas, manufactured, illuminating and heating	100.0	145.9	155.6	146.5
Musical instruments: pianos	100.0	126.1	143.8	141.3
Linoleum and asphalted-felt-base floor coverings	100.0	133.2	149.1	141.0
Condensed and evaporated milk	100.0	166.7	148.8	137.0
Ice, manufactured	100.0	168.0	143.6	135.0
Rice cleaning and polishing	100.0	186.7	155.6	124.3
Rubber products	100.0	153.1	128.1	111.7
Motor vehicles, including bodies and parts	100.0	118.1	102.8	101.9
Average [a]	100.0	225.1	205.1	188.6

[a] An arithmetic average of the central items of a weighted frequency distribution, with weights based on wages, averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

TABLE 104

CHANGES IN OVERHEAD COSTS PLUS PROFITS, MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1914-1923

Index Numbers for 52 Industries

Industry	Index numbers of overhead costs plus profits, per unit of product			
	1914	1919	1921	1923
Jute and linen goods	100.0	688.2	468.6	554.4
Hats, wool-felt	100.0	333.2	370.0	487.8
Cast-iron pipe	100.0	546.0	354.4	470.2
Musical instruments: organs	100.0	146.4	234.3	431.3
Oilcloth	100.0	578.0	456.3	429.0
Coke, not including gas-house coke	100.0	222.6	185.0	352.6
Wood distillation and charcoal manufacture	100.0	309.7	102.7	333.3
Worsted goods	100.0	417.4	360.8	318.9
Carpets and rugs, wool, other than rag	100.0	304.5	247.2	304.4
Lime	100.0	230.0	239.1	303.9
Woolen goods	100.0	412.3	271.0	300.6
Lace goods, cotton	100.0	283.2	269.8	285.8
Linoleum and asphalted-felt-base floor coverings	100.0	224.2	226.9	285.5
Cement	100.0	212.6	216.5	284.3
Cotton goods	100.0	465.8	249.3	283.6
Knit goods	100.0	270.2	246.7	269.1
Sugar, beet	100.0	322.9	—— [a]	256.5
Lumber and timber products	100.0	242.0	143.9	249.4

TABLE 104—*Continued*

Industry	Index numbers of overhead costs plus profits, per unit of product			
	1914	1919	1921	1923
Iron and steel: blast furnaces	100.0	253.0	134.0	229.8
Wool shoddy	100.0	283.5	141.4	228.7
Hats, fur-felt	100.0	267.5	142.5	226.7
Cordage and twine	100.0	342.8	229.5	224.9
Clay products (other than pottery) and non-clay refractories	100.0	217.0	189.2	222.0
Canning and preserving: fish, crabs, shrimps, oysters, and clams	100.0	171.7	190.2	212.9
Butter and cheese	100.0	205.6	176.0	208.7
Canning and preserving: fruits and vegetables; pickles, jellies, preserves, and sauces	100.0	202.7	190.1	208.4
Cars, steam and electric railroad, not built in railroad repair shops	100.0	438.0	433.2	204.6
Soap	100.0	144.8	199.8	200.1
Paper and wood pulp	100.0	235.4	141.7	188.5
Sand-lime brick	100.0	203.6	191.2	183.2
Iron and steel: steel works and rolling mills	100.0	250.8	123.7	181.5
Rice cleaning and polishing	100.0	403.3	176.5	179.5
Salt	100.0	209.8	199.0	179.1
Oil, cake, and meal, cottonseed	100.0	347.7	73.5	176.9
Sugar, cane, not including products of refineries	100.0	243.6	98.4	173.0
Explosives	100.0	238.2	219.8	170.3
Paints and varnishes	100.0	165.9	158.5	168.7
Ice, manufactured	100.0	157.3	173.7	168.0
Wire, drawn from purchased bars or rods	100.0	198.0	241.5	165.0
Petroleum refining	100.0	292.8	203.2	161.7
Silk manufactures	100.0	230.9	174.8	160.4
Turpentine and rosin	100.0	458.1	115.2	144.6
Fertilizers	100.0	222.0	81.4	128.1
Flour and other grain-mill products	100.0	190.5	156.6	125.4
Slaughtering and meat packing, wholesale	100.0	130.1	111.4	119.1
Condensed and evaporated milk	100.0	186.3	182.9	116.5
Gas, manufactured, illuminating and heating	100.0	75.3	103.8	112.0
Musical instruments: pianos	100.0	117.8	107.0	105.8
Sugar refining, cane	100.0	248.7	104.0	105.0
Motorcycles, bicycles, and parts	100.0	147.1	175.1	89.1
Rubber products	100.0	130.2	99.2	79.5
Motor vehicles, including bodies and parts	100.0	90.8	82.6	72.4
Average [b]	100.0	235.8	164.8	187.5

[a] 'Value added', less wages, was a negative quantity for this industry in 1921.

[b] An arithmetic average of the central items of a weighted frequency distribution, with weights based on overhead costs plus profits, averaged for the base year and the given year. The central one-fifth of the items, by weight, were included in computing the average.

Summary of Price Changes, 1913-1922

The period under review ends in 1922 with the level of wholesale prices approximately 40 per cent above that prevailing in 1913. But all price elements did not rise in the same degree, as we have seen. These inequalities may be most effectively described if we measure the degree of change in purchasing power, or in command over goods in general, at wholesale, among the several commodity groups.

Raw materials lost approximately 10 per cent in purchasing power, per unit, between 1913 and 1922, while the average unit of manufactured goods gained 4 per cent. (The index of selling prices of manufactured goods derived from census data reveals an even greater advance in the per-unit purchasing power of manufactured goods.)

Raw products of American farms lost 8 per cent in purchasing power per unit during this period; raw non-farm products lost 14 per cent. Processed products of American farms gained 2 per cent, while processed non-farm products gained over 6 per cent in purchasing power, per unit.

Foods lost approximately 9 per cent in purchasing power per unit, while non-foods gained correspondingly. (The gain was restricted to processed non-foods.)

Perhaps more important, with reference to the possibilities of profit on the part of manufacturers, were the changes in the relations of producers' and consumers' goods. Producers' goods experienced a drop of 3 per cent in their real value, per unit, while goods in shape for consumption became some 4 per cent more expensive, in terms of commodities in general. Those producers' goods which were intended for ultimate human consumption or direct use lost 12 per cent in purchasing power, while consumers' goods which had passed through processes of fabrication gained 4 per cent.

The brief recital of these changes between 1913 and 1922 does not sufficiently emphasize their profound importance. At one extreme we have a sharp fall in the real value, per unit, of raw materials, at the other, a sharp rise in the real cost to consumers of the goods they require. The intervening margin, which defines the cost

to the country at large of the contribution of agents of fabrication, was materially widened. These measurements indicate that raw material producers were receiving less, per unit of goods produced, while consumers were paying distinctly more, the net result being a great increase in the real cost of manufacturing. This is the more remarkable because it represents a reversal of the steady cheapening of the services of agents of fabrication which had prevailed before the war.

An analysis of the statistics compiled by the Census of Manufacturers bears out the conclusions of the preceding survey. The average selling price of products of manufacture, when expressed in dollars of constant purchasing power, was approximately 13 per cent higher in 1923 than in 1914.[1] Tracing constituent elements of selling price (expressed in dollars of constant purchasing power at wholesale) we find that in 1923 fabrication costs were 23 per cent higher, per unit, than in 1914. Labor costs were 27 per cent higher, and overhead costs plus profits were 20 per cent higher.

Making full allowance for the possible margin of error in each of these results, they may be accepted as furnishing confirmation and explanation of certain of the important shifts noted on earlier pages. The price changes which occurred between 1914 and 1923 had the effect of increasing substantially the cost to the consumer of the services of agents of fabrication. Which way the causal influences ran—whether prices of manufactured goods were high because fabrication costs were high, or whether the price advantage enjoyed by manufactured goods permitted the payment of high wages, high salaries, and high profits—we do not here inquire. We are concerned only with the final effect, which was to offset the cheapening tendency prevailing in earlier years and to add a considerable amount to the prices paid by buyers everywhere for the services rendered by fabricating agents.

[1] This figure is appreciably higher than that for 1922, which was secured in the analysis of annual data. The two measurements are, of course, independently derived, and different deflators have been used in reducing the original measurements to purchasing power form. We should emphasize, in particular, that the deflating index employed on the census materials is that of the Bureau of Labor Statistics and that the prices of manufactured goods which enter into that index are not those derived from the census data. The actual figure of 13 per cent which we have given above should not, therefore, be looked upon as possessing absolute accuracy; but there is no reason to doubt that the general movement of the prices of manufactured goods, with reference to all prices, was in the direction shown by this index.

The effects of these price changes were felt over a wide range of economic activity. An economy habituated to slowly changing relations among its elements was first stimulated by the sharp price advance occurring between 1915 and 1920 and then subjected to a violent shaking up which, in the course of less than two years, profoundly modified relations established through decades of slow growth. Looking backward now we can see that the shaking-up process did not prevent, and perhaps stimulated, a notable economic advance. There remains a question as to whether anything approaching complete adaptation to the new order was attained before or during this advance.