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Volume Title: The Structure of Manufacturing Production: A Cross-Section View

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Volume Publisher: UMI

Volume ISBN: 0-87014-035-3

Volume URL: <http://www.nber.org/books/blis39-1>

Publication Date: 1939

Chapter Title: II Distribution of Productive Resources among Different Classes of Manufactured Goods

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Chapter URL: <http://www.nber.org/chapters/c6994>

Chapter pages in book: (p. 13 - 57)

II

Distribution of Productive Resources among Different Classes of Manufactured Goods

KNOWLEDGE of the utilization of economic resources in manufacturing may be gained by the appropriate classification of data relating to value of product and other measurable aspects of manufacturing operations. In this chapter these data are analyzed according to four major divisions of commodities. The first is based on the ultimate use of the manufactured product for capital or consumption purposes. Relatively heavy emphasis is placed upon this division throughout the study. Three other divisions of the manufactured product are also presented: 'finished' and 'unfinished' manufactured goods; durable and nondurable goods; farm, forest, and mineral products. Certain cross-classifications are also given. The division first discussed is that of capital-consumption goods.

CONSUMPTION GOODS AND CAPITAL GOODS

All manufacturing production, and all productive effort of any sort, is carried on to satisfy human needs, though in many instances the relationship between the good produced and its ultimate human use is not close. In the production of capital goods the path to ultimate consumers' use is indirect, for only as these goods are used by business agencies to increase the flow of consumption goods is their ultimate purpose served. Unfinished materials, also, are not always

clearly associated with consumer uses, although in the final analysis they are ultimately converted into goods for human consumption or contribute their services, as capital goods, to the speeding of the productive process. While from the broadest point of view all production is for consumption purposes, the less inclusive definition of consumption goods will be used in the following discussion.¹

In measuring the extent of productive activity in the creation of capital and consumption goods two approaches might be used. First, we might consider only those consumption goods turned out by manufacturers in finished form, ready to enter the distributive channels leading to final consumers—in other words, analyze the end-products of manufacturing. The second method (which has been employed in the preparation of this report) is to seek out the industries in which all or a part of the activity is associated with the production of goods destined for human consumption or for capital use and to cumulate the contributions to the creation of the finished product made at each stage. The methods are by no means identical, although changes from period to period revealed by each set of measures should not differ widely. Unfortunately the detail involved in the second method of analysis prevents the easy computation of year-to-year changes, a task made more difficult by the absence of much of the factual information essential to the analysis of

¹ The terms consumption goods and capital goods in this study are identical, as descriptive of broad classes, with the terms consumers' goods and producers' goods used by Simon Kuznets in the National Bureau's studies of capital formation. Dr. Kuznets defines his terms as follows: "*Consumers' Goods*—Commodities and services that, whether finished or unfinished, are, when finished and at their destination, used by households or large ultimate consuming units. Examples: flour, bread, raw wool, clothing. *Producers' Goods*—Commodities and services, whether finished or unfinished, that are, when finished and at their destination, used by business agencies in the process of production. Examples: industrial machinery; steel used therein." (*National Income and Capital Formation, 1919-1935*, National Bureau of Economic Research, 1937), p. 37, footnote.

In part the distinction turns on the ownership, as well as the function, of the goods. Thus materials used to construct a highway have been included with capital (producers') goods, but the automobile, which travels the highway, is considered a consumption good. On the other hand, a Pullman railroad car, which in function is not greatly different from an automobile, is considered a capital good. Obviously there are borderline instances where classification is difficult.

individual industries. However, our present interest lies in the relationships that existed at a particular point in time, not in annual changes.

The view of production afforded by examination of the end-products of manufacturing gives the figures of Table

Table 1
Value of the 'Finished' Products of
Manufacturing Industries

Economic Group	Millions of Dollars			Percentage of the Total		
	1919	1929	1933	1919	1929	1933
Consumption goods	25,773	28,597	14,917	69.6	68.8	79.6
Capital goods (producers' durable goods)	5,641	6,231	1,623	15.3	15.0	8.7
Construction materials	3,705	5,011	1,533	10.0	12.1	8.2
Servicing	1,899	1,705	658	5.1	4.1	3.5
Total	37,018	41,544	18,731	100.0	100.0	100.0

1.² The values of the finished products, at the manufacturing stage, are given for 1929, the year chosen as the base point for our survey, and also for an earlier and a later year, 1919 and 1933. These estimates provide a useful background for the measures yielded by the application of the second method, presented in subsequent tables.

The values of the end-products of manufacturing industries include, it should be remembered, payments for the contributions of nonmanufacturing agencies, chiefly those engaged in the production of the raw materials that enter into manufactures. For the most part these materials have come from domestic sources, though some come from foreign

² These are estimates of Simon Kuznets, made in conjunction with his study of capital formation (see *Commodity Flow and Capital Formation*, I, 99, 136-8 for annual values, 1919-33). The figures in Table 1 are estimates of the total value, at manufacturers' prices, of finished manufactured goods and construction materials. Construction materials are finished goods so far as manufacturing processes are concerned. Nonmanufactured consumers' goods (fruits, vegetables, dairy and poultry products, fresh fish, coal) are estimated by Dr. Kuznets at \$3,279 million; non-manufactured construction materials at \$204 million (*op. cit.*, pp. 128-32, 136, 349).

See Ap. IV for a comparison of these figures and estimates of net value of manufactured products derived in the course of the present investigation.

16 STRUCTURE OF MANUFACTURING PRODUCTION
areas. To the extent that the measures in Table 1 include the value of raw materials of foreign origin, they tend to overstate the value of the product flowing from the domestic productive structure. On the other hand, the values of exported raw materials and semimanufactured goods are excluded from these figures. It has been estimated that the cost of raw and semimanufactured materials of foreign origin used by all manufacturing establishments in 1929 was approximately \$4 billion.³ The value of semimanufactured goods exported in that year we estimate at \$0.9 billion (see Appendix Table IVb). The value of exported raw materials was of course much greater, and should not be overlooked in considering the output of both manufacturing and non-manufacturing operations.

Whereas these estimates of end-products summarize the productive activities of all agencies up to and including the manufacturing stage, the data presented in this report relate to manufacturing industries alone. (In Appendix IV a group-by-group comparison is made of estimates of total value with estimates of the value arising in manufacturing operations alone.) The method followed in our survey has been to examine each manufacturing industry separately, and to allocate the value of product (sales) of manufacturing establishments and the other measurable aspects of manufacturing described in Chapter I to four groups of commodities. The first three groups are similar to, though not identical with, the divisions in Table 1. The first division includes goods destined for human consumption. The products of the food industries, most textile products, portions of other industries, such as lumber or steel, are allocated to this group. At the other end of the classification scheme are the capital goods destined, when fully manufactured, for use by business agencies in the process of production. We have put into a separate group manufactured construction materials, which, although ultimately serving ends not unlike the products in the capital

³ See *Materials Used in Manufactures: 1929*, U.S. Bureau of the Census.

goods group, are differentiated because of the direct importance, from the consumers' point of view, of residential construction.⁴ Finally, there is a miscellaneous group of producers' supplies—nondurable commodities used by producers both inside and outside the manufacturing system for which no adequate accounting by ultimate product could readily be made.⁵

In order to group together all manufacturing operations having a common end, it was necessary to classify, according to the scheme just outlined, the products of the 326 industries recognized in the 1929 Census of Manufactures and to determine the proper percentage of the industry total associated with each division. In some industries there are many products with diverse uses; in others activity is centered on the production of a single commodity, intended for a single market. Industries producing materials of general use such as steel ingots, sulphuric acid, and alcohol presented special problems of allocation. Trade estimates of ultimate markets for various products were used in many instances. Studies by governmental agencies also helped to trace the destination of manufactured goods. However, the uses of certain products, containers, for example, are so widespread and associated with so many other manufacturing processes that accurate division of the total is impossible; for the most part these products have been classed as producers' supplies. The classification of the 326 individual manufacturing industries according to the

⁴ When a division between the two major groups is desired for rough comparisons, we have ascribed one-third of construction materials to consumption goods, two-thirds to capital goods.

⁵ We recognize three divisions of producers' supplies: (1) producers' fuels, etc., (2) containers, (3) other producers' supplies. The first group includes products that are used to facilitate the productive process; for example, a large portion of the gasoline and fuel oil produced, also that part of coke not consumed in the heating of houses, explosives used for productive purposes, fertilizers, etc. The second group includes tin cans, bags, boxes and crates, wrappings, etc. The third group includes general supplies such as writing paper, ink, stationery, factory and mill supplies of a nondurable character. The 1929 value of products in the first group is \$3,218 million, of which \$1,017 million is the value added by manufacture. The corresponding figures for the second and third groups are, in millions of dollars, 1,568 and 2,441 of value of products, and 714 and 1,378 of value added, respectively. Analysis of the various products included in the producers' supplies group suggests that 90 per cent ultimately appears in the form of consumption goods, 10 per cent as capital goods.

various divisions just described is shown in Appendix I. Where a fractional allocation to two or more groups was necessary, the percentages used are given.⁶

Table 2 summarizes measures relating to the distribution of productive resources between consumption goods and capital goods manufactured in 1929. The first part of the table gives the value of product and related costs, number of employees, volume of employment, and the capital investment associated with the manufacture of these classes of goods; the second part gives the same figures as percentages of the total for all manufactures.⁷ Measures for the more important subdivisions of consumption goods are presented in a later section.

Of the total sales of manufactured goods in 1929, 60 per cent related to goods clearly intended for human consumption. If, by way of rough approximation, we assume that a third of the value of construction materials represents residential building and that 90 per cent of producers' supplies eventuate in consumers' goods or services, the proportion of manufacturing associated with the making of consumption goods is increased to over 70 per cent (72.8).

In similar fashion the other measurable aspects of manufacturing operations can be identified with either capital or consumption goods. Of total value added by manufacture (a more precise measure of manufacturing activity than gross value of product) a smaller amount, 57.5 per cent, is directly associated with consumption goods, and when adjust-

⁶ A single set of allocation percentages has been applied to a given industry. Thus, the same set of ratios has been used to allocate the industry's value of product, the various elements of cost, number of wage earners, and other items as well. Usually the basic ratios have been derived from sales data, though occasionally from some other aspect of the industry's product. In the absence of other information it is assumed that the proper ratio in every instance is approximately this common ratio, or that within the aggregate of all industries the departures from the common ratios tend to offset one another. In interpreting the results presented in this chapter, the possible effect of this assumption should not be ignored. In general the result is probably to dull contrasts otherwise more clearly evident. The many instances where industry divisions are not required and variations in the size of the items analyzed help to minimize the effect of a method made necessary by the limited data at hand.

⁷ These figures are shown graphically in the series of summary charts in Ch. IV.

Table 2

Value of Product and Measurable Factors of Production
classified according to Ultimate Use of Product, 1929

	Consumption Goods	Capital Goods	Construc- tion Materials	Producers' Supplies	All Manufac- tures
<i>Elements of Value of Product (millions of dollars)</i>					
Gross value of product (sales)	42,504	13,920	6,784	7,227	70,435*
Cost of materials	24,162	6,865	3,405	4,118	38,550*
Value added by manufacture	18,342	7,055	3,379	3,109	31,885*
Wages	6,049	3,198	1,361	1,013	11,621*
Salaries	2,045	820	379	351	3,595*
Overhead costs other than salaries, plus profits	10,248	3,037	1,639	1,745	16,669
<i>Number of Employees (thousands)</i>					
All employees	5,681	2,437	1,161	919	10,198
Wage earners	4,900	2,132	1,021	786	8,839*
Salaried employees	781	305	140	133	1,359*
<i>Estimated Aggregate Man Hours (millions)</i>					
Man hours, total	14,015	6,136	2,917	2,359	25,427
Wage earners	12,087	5,365	2,566	2,019	22,037
Salaried employees	1,928	771	351	340	3,390
<i>Estimated Capital Investment (millions of dollars)</i>					
Total capital	27,367	9,761	6,443	6,642	50,213
Fixed capital	13,580	5,403	4,078	3,892	26,953
Circulating capital	9,579	3,374	1,763	1,640	16,356
<i>Horsepower of Primary Movers (thousands)</i>					
Horsepower	17,917	10,788	7,789	6,437	42,931*
<i>Elements of Value of Product</i>		<i>Percentage of All Manufactures</i>			
Gross value of product (sales)	60.3	19.8	9.6	10.3	100.0
Cost of materials	62.7	17.8	8.8	10.7	100.0
Value added by manufacture	57.5	22.1	10.6	9.8	100.0
Wages	52.1	27.5	11.7	8.7	100.0
Salaries	56.9	22.8	10.5	9.8	100.0
Overhead costs other than salaries, plus profits	61.5	18.2	9.8	10.5	100.0
<i>Number of Employees</i>					
All employees	55.7	23.9	11.4	9.0	100.0
Wage earners	55.4	24.1	11.6	8.9	100.0
Salaried employees	57.4	22.5	10.3	9.8	100.0
<i>Estimated Aggregate Man Hours</i>					
Man hours, total	55.1	24.1	11.5	9.3	100.0
Wage earners	54.9	24.3	11.6	9.2	100.0
Salaried employees	56.9	22.7	10.4	10.0	100.0
<i>Estimated Capital Investment</i>					
Total capital	54.5	19.5	12.8	13.2	100.0
Fixed capital	50.4	20.1	15.1	14.4	100.0
Circulating capital	58.6	20.6	10.8	10.0	100.0
<i>Horsepower of Primary Movers</i>					
Horsepower	41.7	25.1	18.2	15.0	100.0

* As reported by the Bureau of the Census, *Census of Manufactures, 1929*.

ment is made for the miscellaneous groups the total for all consumption goods is 70 per cent of value added. Apparently from 25 to 30 per cent of manufacturing activity was devoted in 1929 to the creation of capital goods, to be used either for the replacement and extension of existing capital equipment of the economy or for the development of new products and new processes.

One qualification that should be recognized, however, in the discussion of the relative emphasis upon capital construction in manufacturing industries in 1929 is that manufacturers in all industries, regardless of their products, give some attention to the maintenance and development of their capital plant. In some consumption goods industries capital goods may be constructed by members of the plant's working force and installed as operating units. Capital formation of this character, as well as the maintenance of existing capital, escapes detection in our analysis, since we associate such activity in consumer goods industries with the consumption good that it helps to produce. So far as this work is a continued, normal activity it may perhaps be properly identified with the industry's product, but the point should not be ignored in the interpretation of the above data on the distribution of productive resources.

On turning to the analysis of wage payments, we find that over \$6 billion was paid in 1929 to wage earners engaged in manufacturing processes resulting ultimately in consumption goods (not including the billion dollars of wages paid for the manufacture of producers' supplies). The making of capital goods accounted for over \$3 billion of wages, construction materials a billion and a third. The wages paid in the fabrication of capital goods constituted a significantly higher percentage of total wages (27.5) than either salaries or other overhead expenses in these industries contributed to their respective totals (22.8 and 18.2 per cent respectively). Overhead costs (other than salaries but plus profits) were relatively high in the making of consumption goods (61.5

per cent as against 52.1 per cent for wages). As our analysis of the constituent elements proceeds, some reasons for these differences will appear. For one thing, the heavy wage payments in capital goods industries are found to correspond with fairly high labor requirements. Chapter III traces the differences also to the overhead item and the inclusion of heavy distributive costs, taxes, and other expenses in the factory values of consumption goods.

Employment is measured by aggregate man hours, which is the composite of number of wage earners and estimates of average hours worked (Ap. II and III). While hours worked varied widely, there appears to be little association of a long or short work week with the industry divisions we here recognize; i.e., the differences between the percentages of number of employees and of man hours associated with the several divisions of Table 2 are minor.

If we summarize the figures relating to labor for the capital goods group (exclusive of construction materials) we have the following: wages, 27.5 per cent of the total; number of wage earners, 24.1 per cent; man hours of wage earners, 24.3 per cent; salaries, 22.8 per cent; number of salaried employees, 22.5 per cent; man hours of salaried employees, 22.7 per cent. Since the measures relating to wage earners in the capital goods group are higher than the corresponding percentage of total value added arising from these activities (22.1), we may conclude that, in comparison with the requirements of consumption goods manufacture, the manufacture of capital goods requires a relatively greater labor investment. The figures also suggest that while no greater effort in terms of per capita hours is required, wage earners in capital goods industries receive a relatively greater wage payment. No similar conclusion, however, can be reached concerning salaried employees.

Capital estimates for manufacturing industries based on the returns of over 90,000 corporations⁸ place the total

⁸ These estimates of capital investment are based on the capital assets appearing on

amount of capital invested in manufacturing at some \$50 billion. Almost 55 per cent is directly associated with the fabrication of consumption goods, while indirectly traceable to consumption purposes is most of the additional 13 per cent used in industries making producers' supplies, and approximately a third of a like 13 per cent invested in the making of construction materials. Approximately 70 per cent, therefore, of the capital invested in manufacturing industries is being used to make consumable goods and about 30 per cent to turn out new capital. It would appear that the portion of the capital structure of manufacturing industries devoted to the making of products for consumption purposes is fully as great as the portion of the total labor supply used for the same purpose. Indeed, it is greater if the relatively heavy capital requirements of the producers' supplies group are taken into consideration, for we estimate that most of these supplies are used in making consumption goods.

The capital invested in industries manufacturing capital goods is surprisingly small, relative to the use of other productive factors. Only 19.5 per cent of total capital is represented in these industries, in contrast to 27.5 per cent of all wages. For two items alone, cost of materials and overhead costs, were the ratios lower. It is notable also that this relatively low percentage for capital is not due to the absence of other than fixed capital items. It is rather to be explained by the exceptionally heavy fixed capital requirements in the construction materials (lumber, cement, etc.) and producers' supplies (petroleum refining) industries—in part invested in land and natural resources—and the relatively heavy investment in circulating capital in the consumption goods

the books of record of domestic corporations whose activities are chiefly in the manufacturing field as reported to the Bureau of Internal Revenue. What is here termed fixed capital is the recorded value of lands, buildings, and equipment, less depreciation. Circulating capital includes cash and inventories only, accounts receivable being excluded as a duplicating item since they are largely offset by accounts payable. Total capital includes the above items plus miscellaneous assets such as copyrights, formulas, goodwill, sinking funds, and guaranty deposits. The 1929 value of miscellaneous assets in manufacturing is approximately \$7 billion. See Ap. VI for a description of these capital estimates.

group. Fixed capital investment is not relatively heavy in the latter group, for the percentage of the total here represented (50.4) is the lowest ratio for all the items save one, horsepower of primary movers.

Relatively, the power capacity (horsepower) in consumption goods industries is very low (41.7 per cent of all power capacity); it is high for producers' supplies, and highest for construction materials manufacture. In this last named group is found 18.2 per cent of the capacity of all prime movers, although the value added by these industries in 1929 was but 10.6 per cent of the value added by all manufactures. Peculiar circumstances, such as the heavy power requirements of the cement industry, help to explain these concentrations. They provide reasons as well why the horsepower statistics cannot be used to measure the relative capital investment in manufacturing industries. For in general the horsepower statistics, while of interest in themselves, are too much influenced by occasionally heavy industrial requirements and too little representative of advanced technical processes to serve as adequate measures of the use of fixed capital equipment.⁹

Types of consumption goods

The largest of the four groups of ultimate products considered thus far is consumption goods; we proceed now to examine the various types of product within this aggregate.¹⁰

⁹ The residual item, 'value added less wages and salaries', will not serve as a measure of the relative capital investment, although this aggregate includes the service charge on the investment in the form of rent, interest payments, and dividends. The uncertainty and erratic behavior of the profit element plus many payments unrelated to capital needs, such as taxes and distributive expenses, make the total an unreliable measure of capital investment. In the next chapter some of the constituent elements of this residual are examined. We have already commented on the relatively large part of this aggregate for all industries that is associated with the making of consumption goods. If this measure were to be used as a criterion of investment, the effect would be to overstate capital investment in consumption goods industries and to understate capital, by increasing amounts, in the capital goods, producers' supplies, and construction materials groups.

¹⁰ Because there is no means by which the totals for producers' supplies can be allocated to these several divisions of consumption goods, that portion of such supplies as properly should be included with consumption goods has been ignored. Probably most of the containers included in this miscellaneous group are associated with the

Table 3
 Elements in the Manufacture of Goods destined for Human Consumption,¹ 1929

	Foods	Wearing Apparel, etc.	Household Goods	Transportation		Publications	Fuel (mfd.)	Other Consumption Goods ²	Total Consumption Goods
				Motor Cars	Supplies and Other				
<i>Elements of Value of Product (millions of dollars)</i>									
Gross value of product (sales)	12,868	11,395	5,416	6,429	1,884	2,752	677	1,953	42,504
Cost of materials	8,779	6,167	2,592	3,870	1,272	781	351	350	24,162
Value added by manufacture	4,119	5,228	2,824	2,559	612	1,971	326	703	18,342
Wages	977	2,111	1,080	979	188	493	64	157	6,049
Salaries	328	542	336	208	50	416	36	129	2,045
Overhead costs other than salaries, plus profits	2,814	2,575	1,408	1,372	374	1,662	226	417	10,248
<i>Number of Employees (thousands)</i>									
All employees	997	2,144	1,005	713	142	464	63	153	5,681
Wage earners	857	1,953	879	639	122	288	44	118	4,900
Salariat employees	140	191	126	74	20	176	19	35	781
<i>Aggregate Man Hours (millions)</i>									
Man hours, total	2,568	5,158	2,515	1,764	344	1,130	166	371	14,015
Wage earners	2,268	4,698	2,202	1,581	294	702	115	288	12,087
Salariat employees	360	460	313	183	50	428	51	83	1,928
<i>Capital Investment (millions of dollars)</i>									
Total capital	7,235	6,755	4,062	3,418	2,026	1,879	794	1,198	27,367
Fixed capital	3,652	3,016	2,078	1,801	1,240	940	373	480	13,580
Circulating capital	2,434	2,896	1,467	1,317	529	374	192	370	9,579
<i>Horsepower of Primary Movers (thousands)</i>									
Horsepower	4,219	4,036	3,304	3,317	786	1,349	573	333	17,917

Percentage of All Consumption Goods³

Elements of Value of Product

Gross value of product (sales)	30.4	26.8	12.7	15.1	4.4	6.5	1.6	2.5	100.0
Cost of materials	36.4	25.5	10.7	16.0	5.2	3.2	1.5	1.5	100.0
Value added by manufacture	22.5	28.5	15.4	13.9	3.3	10.7	1.8	3.9	100.0
Wages	16.2	34.9	17.8	10.2	3.1	8.1	1.1	2.6	100.0
Salaries	16.0	26.5	16.4	10.2	2.5	20.3	1.8	6.3	100.0
Overhead costs other than salaries, plus profits	27.5	25.1	13.7	13.4	3.7	10.4	2.2	4.0	100.0

Number of Employees

All employees	17.5	37.7	17.7	12.6	2.5	8.2	1.1	2.7	100.0
Wage earners	17.5	39.9	17.9	13.0	2.5	5.9	0.9	2.4	100.0
Salaries employees	17.9	24.5	16.1	9.5	2.6	22.5	2.5	4.4	100.0

Aggregate Man Hours

Man hours, total	18.3	36.8	17.9	12.6	2.5	8.1	1.2	2.6	100.0
Wage earners	18.3	38.9	18.2	13.1	2.4	5.8	0.9	2.4	100.0
Salaries employees	18.7	23.8	16.3	9.5	2.6	22.2	2.6	4.3	100.0

Capital Investment

Total capital	26.4	24.7	14.8	12.5	7.4	6.9	2.9	4.4	100.0
Fixed capital	26.9	22.2	15.3	13.3	9.1	6.9	2.8	3.5	100.0
Circulating capital	25.4	30.2	15.3	13.8	5.5	3.9	2.0	3.9	100.0

Horsepower of Primary Movers

Horsepower	23.6	22.5	18.5	18.5	4.3	7.5	3.2	1.9	100.0
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¹ Both finished and unfinished goods are included in the aggregates here presented. Thus the entries for motor vehicles represent activity not only in the automobile industry but also in industries making upholstery cloth, lumber, and steel. Publications cover both printing and the preceding operations such as ink and paper making. So it is in all

groups. For a detailed description of the groups it is necessary to examine the industry classification of Ap. I.

² Drugs, medicines, sundries, and recreation goods.

³ For total consumption goods as a percentage of all manufactures, see Table 2.

Gross value of products and the other items in Table 2 are allocated according to the eight subgroups of consumption goods in Table 3.

The subdivision of the major group consumption goods provides us with additional information, useful for an understanding of the peculiarities of the aggregate. The food industries comprise the group with largest value of product. Cost of materials is an unusually large item in these industries, but even measured in terms of value added the food group accounts for nearly one-fourth of the total for all consumption goods. On this criterion, however, an even greater percentage (28.5) arises in the making of clothing and other personal goods. Domestic transportation including supplies contributes 17 per cent to the total of all consumption goods; the fabrication of household goods adds 15 per cent. In order of importance in manufacturing the groups thus read: personal goods, foods, transportation, household goods, publications, fuels. But this is the order in terms of their rank by value added alone. Other criteria suggest different rankings.

In terms of wage payments, for example, notable shifts in distribution occur from the ranking based on value added. The group of wearing apparel and allied products remains the most important, but the food industries drop in importance. Wage payments in the food industries account for no more than 16.2 per cent of total wage payments in all consumption goods industries, which is the same percentage as automobiles and less than that for household goods. When we turn to salary payments, the figure for the clothing group falls to more nearly the average figure for other items; the spectacular gain that offsets this decline is in publications,

food industries; the other supplies are more generally distributed. We have previously estimated that one-third of the construction materials were used in residential building.

Unfortunately, subdivision of the capital goods group is not feasible. There is little possibility of tracing the various important raw materials, for example steel, to their final capital products; it is even difficult to approximate the division of resources involved in the final manufacturing stage among the various capital goods. Most machinery is reported by the Census of Manufactures under one great industrial grouping: Foundries and machine shops.

where the value added percentage is almost doubled. Of course, it is well known that a large proportion of the employees of the publishing industries are on a salary basis. But it is no less striking to find that 22.5 per cent of all salaried employees of consumption goods industries are associated with this relatively small group in contrast to 6.5 per cent of value of product, or 10.7 per cent of value added. Before leaving this item, it is of interest to observe that in industries producing motor vehicles the number of salaried employees is notably low.

Still further changes in distribution occur when the aggregate capital for the consumption goods industries is divided among these subgroups. Although fixed capital in the consumption goods industries is relatively small (50.4 per cent of the total against 57.5 per cent of value added) over a fourth is in food processing industries. Wearing apparel, household goods, and motor vehicles follow in order. But when the estimates of circulating capital for the same subgroups are examined, the clothing group is well to the fore with 30.2 per cent of the total allocated to consumption goods. The increase is not enough, however, to displace the food industries from the first rank for all capital combined. The same group leads in the use of power equipment, though the amount used is not disproportionate to the value added by these food industries. Relative to the distribution of the value added total among these groups it is in the household goods, motor vehicles, and manufactured foods groups that the greatest horsepower is utilized. In the wearing apparel and other personal goods industries (chiefly textiles) the proportionate power investment is small. There, as would be supposed, it is the wage earner who is the major contributor to the finished product.

We have thus far discussed the distribution of productive resources used in manufacturing among the classes of consumption and capital goods as reflected in the various measurable aspects of manufacturing operations. We identified the

output of every manufacturing industry with the use to which the products would ultimately be put. The next sections continue this analysis of ultimate use, presenting it against the background of certain other classifications we now proceed to explore. The first of these new groupings classifies manufactured goods according to the stage of manufacturing activity; the second, according to durability in use of the manufactured product; the third, according to the source of the basic raw materials.

FINISHED AND UNFINISHED GOODS

In introducing the preceding section on capital and consumption goods, certain estimates of the value of the end-products of manufacturing industries were given (Table 1). Being the final products of the manufacturing process, these goods are of particular significance for the consuming group at large. In business cycle theory the relative volume of fully manufactured consumers' goods (or, as we term them, finished consumption goods) plays an important role. The present figures throw light on these final manufacturing processes. Equally important, they indicate the extent of resources consumed in intermediate manufacturing activities.

Manufacturing processes are not readily classified by stage of fabrication. We have considered as 'finished' the products of the last manufacturing enterprise to handle a particular good prior to its entering the hands of the distributing agent for the ultimate consumer or capital user. At least the goods are finished so far as the manufacturer is concerned. In general this means that while the value of these goods will increase before reaching the consumer, their form will not be altered. There are exceptions to this rule, notably in the construction industry, where changes in form occur beyond the manufacturing process. Our procedure has been to group with finished products those construction materials that do not reappear in the products of other manufacturing industries. The tables are given in sufficient detail, however, to

make possible the ready exclusion of construction materials from the finished goods total, should any reader so desire.¹¹

From the viewpoint of the productive process as a whole, only goods destined for human consumption are properly defined as 'finished'. While our immediate distinction includes some capital goods among finished goods, subclassification makes possible their separation. We have therefore four major groups of manufactured commodities: (a) finished consumption goods; (b) finished capital goods (including all 'finished' construction materials regardless of ultimate use in residential building); (c) unfinished consumption goods; (d) unfinished goods destined to become finished capital equipment (or final stage construction materials). The first of these groups is the familiar classification 'consumers' goods'; the other three comprise the group usually defined as producers' goods.

Although we set up the classes of finished and unfinished manufactured goods, we cannot with full assurance interpret the industry data as representing a particular stage in manufacturing activity. The value of these 'finished' goods is the value of the end-products of manufacturing—at cost to the consumers and agencies once removed from manufacturers. But, though relating to end-products, these values need not represent the terminal stages of manufacturing processes as such, for they may well include activities that under other circumstances would be considered preliminary to a final manufacturing stage. In the making of rubber tires, for example, a succession of processes carries forward the basic materials, chiefly crude rubber and twisted cotton cords, to the

¹¹ In general, decisions whether particular products are to be termed finished (so far as manufacturing is concerned) have paralleled similar decisions made in the National Bureau's capital formation study. Unlike that study, however, this investigation considers within its purview the character of manufacturing processes whose products are termed 'unfinished'. A further distinction is that this study has made the 'industry' rather than the 'commodity' the unit, in order to use the various industry statistics, though industry divisions, wherever they seem necessary, are based upon value figures for the product. Certain of the discrepancies between the capital formation figures and those presented here arise from this fact; differences in definition and scope account for the rest.

finished product—pneumatic tires—all within the same industry. Some of the wage earners in the rubber tire industry are engaged in activities on a level with workers in cotton goods factories or steel rolling mills. In the case of rubber tires, we associate all the workers with a finished good; in the other instances cited the wage earner's product is for the most part unfinished. However, when an industry sees the goods it makes in shape for final consumption there is a measure of unity in the entire process. Each step is articu-

Table 4

Finished and Unfinished Goods in
Manufacturing Production, 1929

(the unit is \$1 million, except as indicated)

	Unfinished Goods	Finished Goods	Finished as a Percentage of All Manufactures
Value of product*	21,930	48,505	68.9
Cost of materials	12,616	25,934	67.3
Value added by manu- facture	9,314	22,571	70.8
Wages	3,805	7,816	67.3
Salaries	961	2,634	73.3
Overhead costs other than salaries, plus profits	4,548	12,121	72.7
Wage earners (thousands)	2,894	5,945	67.3
Salaried employees (thou- sands)	344	1,015	74.7
Horsepower of primary movers (thousands)	19,675	23,257	54.2

* The total value of product (sales) of all finished products exceeds by a considerable margin a similar total based on data from Dr. Kuznets' study of capital formation (cf. Table 1). The discrepancy is explained chiefly by differences of definition. For example, the present estimates include manufactured gas, motion pictures, producers' supplies such as business stationery, and gasoline, and also the full value of publications, including receipts for advertising. In Dr. Kuznets' study an effort was made to exclude all producers' supplies that would appear in the distributive mark-up at later stages of production. In addition, we have used the 'industry' rather than the 'commodity' tables of the Census and have therefore included some items omitted by Dr. Kuznets. In general the estimates differ as they do because they are designed to serve different purposes. Ap. IV discusses some of the reasons for the difference.

lated with the next in a technological order; there is no recourse to exchange in the public market. The demand for the product of all workers is direct and no part of it is derived through a secondary industrial process. To this extent the distinction we make is real from the point of view of the manufacturing structure.¹²

Subject to the qualifications on definition of finished and unfinished products noted above, we have in Table 4 the division into these two groups of the elements of value of product, the number of employees, and the horsepower of primary equipment in manufacturing industries in 1929.

Approximately 70 per cent of manufactured products are in final form, or at least are at the final manufactured stage. The percentage varies somewhat, but of all value added by manufacture, 29.2 per cent relates to unfinished commodities, 70.8 per cent to what we term finished goods. The percentage is higher for salaries and overhead, lower for wages and number of wage earners. It is lowest for horsepower, since only 54 per cent of the total horsepower in manufactures is in the finished goods industries. It is in the earlier stages of manufacture that the application of power is so important.¹³

The manner in which the items of Table 4 are distributed according to stage of output varies with the type of product. We learn, therefore, more about finished and unfinished goods if we study them against the divisions of ultimate use already established (Table 5). That we learn more, in turn, about these capital-consumption goods is a double gain. For

¹² Much integration of industrial activity is accomplished, however, by the common ownership of establishments in different industries. Where this occurs the industries we list as at the 'unfinished' stage are somewhat closer to their final market than their classification as unfinished suggests. On the other hand, there is some intra-industry transfer of manufactured products, much of it relating to what we have termed finished products. The total amount paid for contract work was not reported in 1929, but was \$601 million in 1925, the last year the data were compiled (p. 1301 of *Census of Manufactures, 1925*). In addition, the purchase and resale of merchandise swells the Census totals; it was estimated that all such sales were \$534 million in 1929 (*Distribution of Sales of Manufacturing Plants, 1929*, p. 52).

¹³ For example, in the iron and steel, pulp and paper, cotton goods, and lumber industries, power equipment in 1929 was rated at 14.8 million horsepower. This is 34 per cent of all horsepower used in manufacturing, though these industries contributed but 11.2 per cent of all value added.

Table 5

Value of Product and other Items relating to Manufacturing Production, 1929
Divided according to Stage of Production and Ultimate Use of Product

Stage of Production and Ultimate Use	Gross Value of Product	Cost of Materials	Value Added (millions of dollars)	Wages	Salaries	Overhead Costs other than Salaries, plus Profits	Wage Earners	Number of Salaried Workers (thousands)	Horse-power
<i>Division of All Manufactures</i>									
Unfinished goods	21,930	12,616	9,314	3,805	961	4,548	2,894	344	19,675
Consumption goods	10,976	6,472	4,594	1,870	466	2,168	1,515	163	8,369
Capital goods	6,552	3,710	2,833	1,211	296	1,326	824	105	6,581
Construction materials	1,511	778	733	319	59	355	241	23	2,150
Producers' supplies	2,891	1,647	1,244	405	140	699	314	53	2,575
Finished goods	48,505	25,934	22,571	7,816	2,634	12,121	5,945	1,015	23,257
Consumption goods	31,528	17,690	13,838	4,180	1,579	8,079	3,385	617	9,549
Capital goods	7,368	3,146	4,222	1,987	524	1,711	1,398	201	4,207
Construction materials	5,273	2,627	2,646	1,041	320	1,285	780	117	5,639
Producers' supplies	4,336	2,471	1,865	608	211	1,046	472	80	3,862
<i>Division of Consumption Goods</i>									
Unfinished consumption goods									
Foods	1,323	1,043	280	57	27	196	47	11	731
Wearing apparel, etc.	3,061	2,322	1,639	609	163	777	641	54	2,349
Household goods	1,000	871	729	306	77	346	282	28	1,602
Transportation	3,287	1,886	1,401	626	133	642	422	49	2,684
Publications	751	321	430	175	64	191	117	1	964
Other	54	29	25	7	2	16	6	1	39

Finished consumption goods

Foods	1,575	7,736	3,839	920	301	2,618	810	128	3,488
Wearing apparel, etc.	7,434	3,845	3,580	1,413	378	1,708	1,312	137	1,687
Household goods	3,816	1,722	2,094	773	259	1,062	597	98	1,703
Transportation	5,025	3,255	1,770	541	126	1,103	339	46	1,419
Publications	2,001	460	1,541	319	352	870	171	155	385
Other	1,677	672	1,005	214	163	628	156	53	867

Percentage of Unfinished or Finished Manufactures

Unfinished goods	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Consumption goods	50.0	51.3	48.4	49.2	48.5	47.7	52.4	47.4	42.5
Capital goods	29.9	29.5	30.4	31.8	30.8	29.1	28.5	30.5	33.5
Construction materials	6.9	6.2	7.9	8.4	6.1	7.8	8.3	6.7	10.9
Producers' supplies	13.2	13.0	13.3	10.6	14.6	15.4	10.8	15.4	13.1
Finished goods	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Consumption goods	65.0	68.2	61.3	53.5	60.0	66.7	57.0	60.8	41.1
Capital goods	15.2	12.1	18.7	25.4	19.9	14.1	22.0	19.8	18.1
Construction materials	10.9	10.2	11.7	13.3	12.1	10.6	13.1	11.5	24.2
Producers' supplies	8.9	9.5	8.3	7.8	8.0	8.6	7.9	7.9	16.6

Percentage of Unfinished or Finished Consumption Goods

Unfinished consumption goods	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Foods	12.1	16.1	6.2	3.0	5.8	9.0	3.1	6.7	8.7
Wearing apparel, etc.	36.1	35.9	36.4	37.4	35.0	35.8	42.3	33.1	28.1
Household goods	14.6	13.5	16.2	16.4	16.5	16.0	18.6	17.2	19.1
Transportation	29.9	29.1	31.1	33.5	28.6	29.7	27.9	30.1	32.1
Publications	6.8	5.0	9.5	9.3	13.7	8.8	7.7	12.3	11.5
Other	0.5	0.4	0.6	0.4	0.4	0.7	0.4	0.6	0.5
Finished consumption goods	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Foods	36.7	43.7	27.8	22.0	19.1	32.4	23.9	20.7	36.5
Wearing apparel, etc.	23.6	21.8	25.9	22.3	23.9	22.3	38.8	22.2	17.7
Household goods	12.1	9.7	15.1	18.5	16.4	13.1	17.6	15.9	17.8
Transportation	15.9	18.4	12.8	13.0	8.0	13.6	10.0	7.5	14.9
Publications	6.4	2.6	11.1	7.6	22.3	10.8	5.1	25.1	4.0
Other	5.3	3.8	7.3	5.1	10.3	7.8	4.6	8.6	9.1

purposes of presentation it has been deemed advisable to consolidate the measures into a single table, in order that comparisons for all groups can be most easily made.

Capital goods comprise a greater percentage of the unfinished goods group than they do of the finished goods group; the opposite is true for consumption goods. The significance of this relationship probably rests in the low unfinished total for consumption goods, and the explanation, or at least part of the explanation, is that few of the manufactured food products change hands at the unfinished manufacturing stage. Chief of the unfinished consumption goods are wearing apparel and transportation equipment and supplies, groups where the method of manufacture requires a succession of production processes. There is some variation in the extent of the unfinished area in the manufacture of construction materials and producers' supplies. On the whole, a relatively small percentage of total construction goods are called unfinished, but a relatively large percentage of producers' supplies are so termed.

Careful scrutiny of the various measures reveals interesting differences. For example, the amounts paid as wages in industries making finished capital goods (25.4 per cent of the total for all finished goods) is markedly higher than the corresponding percentage for value added (18.7) or overhead plus profits (14.1). But when we examine the same ratios for the unfinished capital goods, the differences are by no means as marked: 31.8 per cent for wages as against 30.4 for value added and 29.1 for overhead. (Of course it is the relative size of these ratios that concerns us here; their magnitude was commented upon in the preceding paragraph.) The counterpart of these relationships is the low percentage of wages for finished consumption goods, the high figure for overhead.

Table 5 shows the divisions of the finished-unfinished groups according to the capital-consumption goods division. Table 6 reverses this procedure and indicates the finished

Table 6
 Relative Importance of Finished Manufactures, 1929,
 Classifications based on Ultimate Use of Product
 Finished as a Percentage of Finished plus Unfinished

Ultimate Use	Gross Value of Product	Cost of Materials	Value Added	Wages	Salaries plus Profits	Overhead Costs other than Salaries, plus Profits	Number of Wage Earners	Salaries	Employees	Horse-power
<i>Divisions of All Manufactures</i>										
Consumption goods	74.2	73.2	75.4	69.1	77.2	78.8	69.1	79.1	53.3	
Capital goods	52.9	45.8	59.8	62.1	63.9	56.3	61.4	65.6	39.0	
Construction materials	77.7	77.2	78.3	76.6	84.4	78.3	76.4	83.6	72.4	
Producers' supplies *	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	
All manufactures	68.9	67.3	70.8	67.3	73.3	72.7	67.3	74.7	54.2	
<i>Divisions of Consumption Goods</i>										
Foods	89.7	88.1	93.2	94.2	91.8	93.0	94.5	92.1	82.7	
Wearing apparel, etc.	65.2	62.3	68.6	66.9	69.9	69.8	67.2	71.7	41.8	
Household goods	70.5	66.4	74.2	71.7	77.1	75.4	67.9	77.8	51.5	
Transportation	60.5	63.3	55.8	46.4	48.4	63.2	44.5	47.9	34.6	
Publications	72.7	58.9	78.2	64.5	84.6	82.0	59.4	88.6	28.5	
Other	90.9	95.9	97.6	96.8	98.8	97.5	96.3	98.1	95.7	

* A constant percentage of the items relating to producers' supplies has been assumed to refer to finished goods. The figure, 60 per cent, is based on a survey of the items included in the group.

goods part of four divisions of the capital-consumption goods classification. The entries are finished goods as percentages of the sum of the finished and unfinished goods for the 1929 value of product, elements of cost, employment, and horsepower capacity.

Finished products comprise varying percentages of the totals. Among all consumption goods approximately one-fourth are unfinished and three-fourths finished—that is, three-fourths of the sales of these products enter at once the distribution channels leading to ultimate consumers. On the other hand, the sales value of finished capital goods represents little more than one-half of all capital goods. (The amount paid for materials in the finished capital goods industries is only about 45 per cent of that paid in all industries making capital goods, though the value added by these industries is 60 per cent.) The extent to which products pass from industry to industry is accordingly much greater in the case of capital goods than in that of goods destined for human consumption.

Certain theoretical implications are suggested by the more numerous exchanges that mark the course of capital goods manufacture. For it seems reasonable that where the exchanges between the primary and the final stages of manufacture are more numerous, errors in business judgments have a greater chance to creep in. Not only are more exchanges involved, but also a large part of the demand is further and further removed from the ultimate user. This derived demand becomes less certain, duplications of orders during expansion more frequent, and the surging influence of transmitted demand more evident under circumstances such as we have described for the capital goods industries. There are of course factors that weaken the influence we suggest. For one thing, the integration through common ownership of plants engaged in successive manufacturing operations tends to dispense with some portion of the exchanges that

concern us. Nevertheless the point seems worthy of comment.¹⁴

In the food industries \$12 billion out of \$13 billion of product are sold for immediate distribution to ultimate consumers.¹⁵ In the making of transportation goods for domestic use, however, we find almost as high a concentration of unfinished goods as was observed above in the case of capital goods. In some respects the attenuation of the manufacturing process is here greater than in capital goods, for the value of product criterion is not altogether satisfactory. The relative number of employees engaged in the preliminary manufacturing processes is greatest in transportation goods industries at least one stage of manufacture removed from the buying public. In the transportation goods group 55.5 per cent are in the 'unfinished' subgroup as against 38.6 per cent in the unfinished subgroup of capital goods. This is a relative situation only, of course, for the number of wage earners engaged in the preliminary stages of capital manufacture is twice the number of workers whose ultimate products are passenger automobiles or related commodities.¹⁶

The estimates of capital investment presented in the preceding section cannot be divided between unfinished and

¹⁴ Wesley Mitchell observes that Thorstein Veblen placed considerable importance on what he called "interstitial adjustments" in the industrial process (*Theory of Business Enterprise*, Ch. I and II). Dr. Mitchell suggests, however, that the relative number of individual enterprises engaged in making exchanges rather than the relative volume of sales at different productive levels is more important in affording chances for errors in business judgment, and further that where the number of enterprises is large, the chances of errors offsetting one another will be greater and the disturbing effect on general business stability less. The errors in business judgment contemplated in the text discussion would in all probability not tend to offset one another but rather to cumulate the effects of expansion or contraction.

¹⁵ Examples of the exceptions are sales of sugar and flour to bakeries.

¹⁶ Because of the ramifications of corporate control in the automotive industry and the extent of vertical integration of the processes leading to the finished product, the opportunity for maladjustment of demand and supply suggested in the preceding paragraph is probably not so great as our figures might indicate. On the other hand, the figures relating to the unfinished stages of automobile manufacture are probably underestimated, for it is impossible to pick up all the industries that in some way contribute to the finished automobile. We believe, however, that the important contributing industries are included (see Ap. I) and that no great understatement exists. Indeed, as measures of the total resources utilized in making goods for personal use some overstatement probably exists because of an insufficient allowance for the use of passenger automobiles for productive (capital) purposes.

finished goods industries, since they are based upon the broad groupings of the Treasury statistics. Some evidence on the use of capital in the major stages of manufacture is to be had from the detailed tabulations of capital investment in the Pennsylvania and Massachusetts State Censuses of Manufactures.¹⁷ The median ratio of capital to sales for industries making unfinished goods was 61.8 per cent as against 66.8 per cent for finished goods. These figures suggest a relatively higher capital investment at the finished stages of production. If we turn to the horsepower statistics of Table 5 for a confirmation of this tentative conclusion, we find none. For, as was remarked earlier, clearly the greater relative power investment (though not the greater absolute amount) is in the first manufacturing stages. Table 6 makes this clear: whereas from 67.3 to 74.7 per cent of various items (other than horsepower) relating to all manufactures appear in the 'finished' group, only 54.2 per cent of the horsepower total is in these finished goods industries. If allowance is made for the heavy power requirements of the two quasi-finished groups, construction materials and producers' supplies, the contrast is even more striking.

DURABLE, SEMIDURABLE, AND TRANSIENT GOODS¹⁸

The manufacture of durable goods has come to play a more and more important role in all manufacturing activity.¹⁹ As standards of living generally have risen there has been an accompanying increase in the output of nontransient goods. In large part the simpler wants relate to nondurable articles—food, heat, and clothing. Of the basic wants, the need for

¹⁷ More extended analysis of these records is made in the latter part of Ch. III.

¹⁸ We return here to a variation of our first classification, that of capital and consumption goods. By definition, all capital goods are durable; indeed, all durable goods may be considered for some purposes to be capital goods. We here subdivide the durable goods total into two groups: (1) durable consumption goods, (2) capital goods and construction materials.

¹⁹ The relative advance in the output of durable goods for both consumption purposes and use as capital equipment is demonstrated in two reports of the National Bureau of Economic Research: *Economic Tendencies in the United States* by F. C. Mills (1932), Ch. 6, and *Commodity Flow and Capital Formation*, Vol. I, by Simon Kuznets (1938).

shelter alone requires the creation of durable goods. As the average levels of economic consumption have risen, including a wider variety of economic goods, durable goods have increased in importance.

Durable goods have increased in importance in manufacturing for yet another reason: the advance in machine technology and the replacement of labor as a direct productive agent by durable capital goods. This has meant the growth of the capital goods industries and the increasing output of producers' durable goods. From two sides, then, we have had forces shifting the balance of the productive structure toward the making of goods of continued use.

Changes in the relative output of durable goods reflect more than long run, structural changes. Here, particularly, we should expect to find alteration in the various relationships in manufacturing production as we shift our base of observation from period to period. In other words, rather marked effects of the fluctuating conditions of business should be expected in our measures. Accordingly, we must repeat, with added emphasis, that the relationships revealed in the study of the 1929 data must be interpreted with reference to the business conditions prevailing in that year. The measures we present are no less important because this is so; the reader simply must not demand from them what they cannot furnish.

Cyclical fluctuations in the output of durable goods are to be expected. The peculiar characteristic of durable goods is that their purchase by a prospective user results in the transfer of a stock of services from the productive agency to the point of consumption. This is true whether the user is an ultimate consumer or a producer expanding the scale of his operations through the installation of a new machine; for in the purchase of a durable good, it is a fund of future services for the most part that is obtained. The inventory of such future services in the hands of consumers, fixed in amount by no definite rule but available in diminishing degree into the

future, is important from the viewpoint of the productive structure, not because of the stability in the usable services enjoyed by the holders of the inventory, but rather because of the instability in the demand on producers of these products for the replacement and replenishing of the stock. The demand for these goods is postponable, yet at times it becomes urgent. In periods of recession both the usefulness of new durable goods and consumer purchasing power are diminished; in periods of more favorable business circumstances the desire and the power to make this demand effective coincide. A powerful contributing influence to cyclical fluctuations in the output of durable goods is the result.

During periods of reduced demand, the usefulness of additional capital goods is obviously less than during periods when wider markets are to be found. Occasionally new capital goods will be found useful even in depression if their installation will replace more costly methods of production. But this usefulness depends on continued output and a prospective customer demand. Even though funds are available for investment the business man will be wary of the future, and there is none, save the producers of the capital goods, who will urge on him the new investment.

Similarly, the consumer finds his demand for durable goods reduced during periods of depression. Expansion in durable consumption goods carries with it in almost every instance a correlative demand for service. Where such service can be rendered by the consumer himself, there need be no deterrent to the purchase of the new durable good, but usually the services are rendered by outside agencies and therefore entail additional costs during periods when such costs cannot readily be carried. During depressions relatively less use is made of automobiles than during more prosperous times, in part because of the costs of gasoline and oil, garage and repair services, taxes and insurance. In less degree there are charges for house service, for gas and electricity, and so forth, that tend to restrict the demand for durable consump-

tion goods. But of course the immediate cause of reduced demand during depression is lower consumer purchasing power. The demand for consumers' and producers' durable goods during depression differs in that the chief restriction on the former is the absence of purchasing power, on the latter it is the limitation of the usefulness, at the moment, of the good in question.

The extended service requirements occasioned by the growth of durable goods have had profound effects on the production structure of the economy. A host of new occupations have been created—the gasoline salesman, the automobile mechanic, and the garage attendant, many employees of the ever widening area of public service (especially that part which is the resultant of the growth of the automobile), the radio repairman, the labor involved in servicing electric and gas appliances. All these nonmanufacturing activities and others correlative with them can be traced to the rise of durable goods.²⁰ Some services are replaced, such as those attendant upon the use of the horse as a means of travel, but the requirements of the new far exceed the savings on the old. The structure of production expands to draw into its sphere these new producers, and though they have their origin in the durable products of manufactures, they withdraw from manufacturing and similar basic activities a considerable portion of the available productive resources. No analysis of the use made of these resources should overlook this fact.

Within the structure of manufacturing production, however, the growth of durable goods has meant the increasing importance of particular industries. These changes are described elsewhere; the data here presented indicate the relative importance, at a fixed date, of the activity in the manufacture of goods of varying time usefulness. Tables 7 and 8 indicate the distribution of productive resources among dur-

²⁰ The familiar roadside business venture depends on the automobile for its existence, though in part it replaced, in a different form, a service formerly located in the community. And the entire radio broadcasting industry would not exist if the public did not buy and operate radio receiving sets.

42 STRUCTURE OF MANUFACTURING PRODUCTION
able, semidurable, and transient goods,²¹ with cross reference to the consumption-capital goods classification discussed previously.

Analysis of the sales of manufacturing establishments (Table 7) indicates that of all goods, durable goods are of chief importance, comprising some 43 per cent of total factory sales. Semidurable goods, chiefly textiles and finished textile products, are 20 per cent of the value of all commodities. Manufactured transient goods account for the rest.²² Approximately the same percentage distribution holds for value added, though the transient goods are a smaller percentage of the total, the durable capital goods more. The percentages relating to durable consumption goods and to semidurable goods are about the same for both value added and value of product.

An even greater relative concentration in the making of durable goods holds for wage payments, the increase being chiefly for durable capital goods. Fifty-five per cent of all wage payments go to wage earners engaged in the processing of durable goods; 38 per cent relate to durable capital goods industries alone. The significance of the relatively high wage payments in the production of these durable goods rests, of course, on the peculiarly sensitive character of the demand for durable goods. With a relatively larger area to influence, the cyclical fluctuations in the demand for durable goods

²¹ In Tables 7 and 8 durable goods include all capital goods, all construction materials, and those consumption goods whose normal service life is estimated at over two years. Transient goods are presumed to have a momentary service life. Semidurable goods are products with an intermediate service life; for the most part they are textile products and other articles of clothing.

In fitting our various data into the rather simplified classification scheme of the text tables, certain rather arbitrary groupings have been made. Almost all producers' supplies were considered transient, though many contribute ultimately to the production of commodities not so classified. Similarly, there are some construction materials, such as paint, that should properly be considered nondurable. In Ap. VII exceptions to the general classifications are shown in such detail as is possible.

²² As usual, in order to arrive at these estimates, it has been necessary in certain instances where a given commodity has several uses, not all of which fall in a single category, to divide the value of product or the particular element of cost among the several classes. As before, a common industry ratio was used in these circumstances, based in general on the proportions governing value of product. The divisions for the 34 industries affected are recorded in Ap. I.

Table 7

Elements in the Manufacture of Durable, Semidurable, and Transient Goods, 1929

	Durable Goods			Semi-durable Goods	Transient Goods ²	All Manufactures
	Total	Capital Goods ¹	Consumption Goods			
<i>Elements of Value of Product (millions of dollars)</i>						
Gross value of product	30,311	19,576	10,735	14,459	25,665	70,435
Cost of materials	15,396	9,564	5,832	7,939	15,215	38,550
Value added by manufacture	14,915	10,012	4,903	6,520	10,450	31,885
Wages	6,341	4,430	1,911	2,599	2,681	11,621
Salaries	1,641	1,144	497	678	1,276	3,595
Overhead costs other than salaries, plus profits	6,933	4,438	2,495	3,243	6,493	16,669
<i>Number of Employees (thousands)</i>						
All employees	4,967	3,455	1,512	2,669	2,562	10,198
Wage earners	4,357	3,030	1,327	2,427	2,055	8,839
Salaried employees	610	425	185	242	507	1,359
<i>Horsepower of Primary Movers (thousands)</i>						
Horsepower	23,376	17,933	5,443	6,581	12,974	42,931

Percentage of All Manufactures

<i>Elements of Value of Product</i>						
Gross value of product	43.1	27.8	15.3	20.5	36.4	100.0
Cost of materials	39.9	24.8	15.1	20.6	39.5	100.0
Value added by manufacture	46.8	31.4	15.4	20.4	32.8	100.0
Wages	54.5	38.1	16.4	22.4	23.1	100.0
Salaries	45.6	31.8	13.8	18.9	35.5	100.0
Overhead costs other than salaries, plus profits	41.6	26.6	15.0	19.5	38.9	100.0
<i>Number of Employees</i>						
All employees	48.7	33.9	14.8	26.2	25.1	100.0
Wage earners	49.3	34.3	15.0	27.5	23.2	100.0
Salaried employees	44.9	31.3	13.6	17.8	37.3	100.0
<i>Horsepower of Primary Movers</i>						
Horsepower	54.5	41.8	12.7	15.3	30.2	100.0

¹ Includes all capital goods and all construction materials.² All producers' supplies are considered transient except for a portion (\$347 million value of product) classed as consumers' durable. Probably many more of these products are consumed in durable goods industries. In Ap. VII certain modifications of this table are presented, taking account of exceptions to the general classifications.

have an amplified effect upon the stability of receipts by workers in manufacturing. One must remember that not only are the durable goods industries subject to wide cyclical movements because of the capriciousness of demand, but also that the effect of these fluctuations on the manufacturing structure and the entire economy is magnified because of the proportionately large wage payments typical of these industries.

Because of relatively higher wage rates, the percentage of wage earners attached to durable goods industries in 1929 fell below the corresponding figure for wage payments. Nevertheless, roughly half the wage earners in manufacturing in 1929 were engaged in the production of durable goods, and over two-thirds of these made capital goods or construction materials. More than half the rest (27.5 per cent of all wage earners) were employed in the semidurable goods industries. Of all salaried employees, on the other hand, many more were making transient goods, relatively fewer were employed in semidurable goods industries.

When the horsepower statistics are examined, the great power capacity of the durable capital goods and construction materials group is outstanding. Despite the heavy investment in these industries the total for the transient goods group remains high; it is in durable consumption goods and semidurable goods that the horsepower investment is relatively low.

Still another point of interest in Table 7 is the distribution of aggregate overhead expenses other than salaries (plus profits) among the several groups. The distribution pattern is very similar to that of cost of materials. That is, a large proportion of the total, relative to the proportions that obtain for other items, occurs in the transient goods group (38.9 per cent as against 23.2 per cent for wage earners and 32.8 per cent for total value added). Correspondingly a relatively low proportion of both overhead and materials for all manufactures appears in the combined capital goods-construction

materials group. Durable consumption goods and semidurable goods show no markedly different ratios. Plausible explanations of these differences are not hard to find. The food industries stood out, it will be remembered, as one group in the consumption goods total in which overhead costs were high. Since the fabricating process is relatively simple, the number of wage earners is not large. Expenditures on materials and overhead, on the other hand, are heavy. Also the burden of certain distributive expenses probably helps to swell the overhead costs of these and perhaps other consumer products; the lightness of such expenses might well account for the lower overhead charges in capital goods. These interrelations among elements of cost are discussed at much

Table 8

Value Added by Manufacture of Consumption Goods, 1929, classified according to Durability in Use

Ultimate Consumer Use	Durable Goods (millions of dollars)	Semi-durable Goods (millions of dollars)	Transient Goods (millions of dollars)	Durable Goods (per cent)	Semi-durable Goods (per cent)	Transient Goods (per cent)
Foods	..	..	4,119	..	..	53.8
Wearing apparel, etc.	308	4,790	130	6.5	81.2	1.7
Household goods	1,935	553	335	40.4	9.4	4.4
Transportation	2,432	463	276	50.8	7.8	3.6
Publications	..	..	1,971	..	..	25.7
Other consumption goods	111	92	827	2.3	1.6	10.8
Total*	4,786	5,898	7,658	100.0	100.0	100.0

* Excludes any part of producers' supplies and construction materials.

greater length, however, in Chapter III where all the data are brought together.

The subgroups of consumption goods do not coincide nicely with the division according to durability. All foods are classified as transient, of course, but many groups have both durable and nondurable subgroups. Table 8 indicates the extent of these subdivisions for the single item 'value added'. Almost all consumers' durable goods fall into two groups:

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household goods and private transportation goods. Of the two the automotive group is the greater. Wearing apparel and personal goods are chiefly semidurable, as would be expected; transient products are mostly foods and publications.

GOODS CLASSIFIED ON BASIS OF CHIEF MATERIAL

Manufacturing industries draw upon a variety of sources for the materials they process. From the forest and the mine, the farm and the range, streams of materials flow through the manufacturing process. Iron, wood, and vegetable fibres are the most important, but they are supplemented by a great variety of products not yet in usable form. The final manufactured product is almost always a combination of these materials, but if we select the basic material in each industry we may roughly classify the products of manufactures according to their principal origin.²³

Certain materials used in manufacturing are purely contributory. They lose their character completely in the manufacturing process, and cannot be identified in the final product. Chief of these materials are the fuels used in manufacturing. Similar is the coke used in smelting iron ore, and the various chemicals used in vulcanizing and processing rubber products. Yet for our purpose the only distinctions that can be made are those that are evident in the final products—which means, of course, a classification based on the dominant, basic material of the industry.

The larger part of manufacturing activity is concerned with nonagricultural materials. Less than one-third of all wage earners manufacture products whose basic materials

²³ In Ap. I the 326 manufacturing industries of 1929 are classified (or divided) according to the various groups discussed in this section (in general the classifications follow those used by the Census of Manufactures). Textiles are classed as vegetable or animal products despite the chemicals used in their manufacture; automobiles are considered metal products despite the textiles and other products necessary to the finished product. To some extent errors arising from such arbitrary classification offset one another in the totals. Where secondary materials are important, the industry totals are allocated in the approximate proportions indicated.

come from the farm. From industry to industry these relationships differ, but in the total the mineral materials predominate. This does not mean that the value of the mineral materials entering the manufacturing system exceeds the value of farm materials used. On the contrary, the total value of agricultural raw materials used in manufacturing industries in 1929 has been estimated at \$8,541 million, and the value of nonagricultural materials at \$4,135 million.²⁴ But if we take the estimates of value added of Table 9 to measure the increase in the values of these materials in manufacturing industries, then farm materials were doubled in value through processing while the values of nonfarm materials were increased sixfold.²⁵

It is not surprising that farm products should have under-

²⁴ Estimates of the U.S. Bureau of the Census, *Materials used in Manufactures* (1929), p. 4. Semimanufactured goods imported into the United States for further manufacture are not included though imported raw materials are (agricultural \$1,778 million, nonagricultural \$426 million). The figures are the "reported or estimated costs of the materials at the factories, . . . which in general combine the values at the farm, mine, etc., with those for such distribution charges as transportation, sales, insurance, and in some cases, middlemen's profits".

The values of different raw materials used in manufacture in 1929 may be contrasted with similar figures for 1899 (*Census of Manufactures, 1900*, VII, cxxxv). Differential price movements of farm and nonfarm products, as well as the changing scope of the Census of Manufactures, affect the figures somewhat. The great increase in the importance of mineral products is obvious, nonetheless.

Raw Materials Used in Manufacturing, 1899 and 1929

Source of Material	1899		1929	
	Millions of dollars	Per cent	Millions of dollars	Per cent
Farm	1,941	81.2	8,541	67.4
Forest	119	5.0	477	3.7
Mines	320	13.4	3,494	27.6
Sea	9	0.4	39	0.3
Hunting and trapping	not reported		125	1.0
Total	2,389	100.0	12,676	100.0

²⁵ See Ap. IV for a comparison of the relative contribution of manufacturing industries and raw material producers to the production of manufactured goods, classified by use. Manufacture accounts for only 39 per cent of the final value (at manufacturers' prices) of foods, but 68 per cent of the final value of wearing apparel, 71 per cent of the value of automobiles and supplies, 79 per cent of household goods, 76 per cent of the value of manufactured construction materials, and 86 per cent of the value of capital goods. These percentages are much smaller if related to the values at the point of consumption. For measures of net value at this stage, see *Commodity Flow and Capital Formation*, Vol. I, Simon Kuznets.

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gone less processing than nonfarm products. With the exception of cotton and wool fibres, most farm products are not subjected to extensive fabrication. Minerals, on the other hand, must be considerably modified in order to meet man's uses. They must be refined and reshaped; frequently they must be assembled at great expense into elaborate forms.

Of agricultural products used as manufacturing materials, farm crops are approximately half again as important, when

Table 9

Number of Wage Earners and Value Added by
Manufacture, 1929

Industries classified according to Basic Material

Basic Material	Number of Wage Earners		Value Added by Manufacture	
	Thousands	Per cent	Millions of dollars	Per cent
Agricultural				
Farm	1,691	19.1	5,533	17.3
Animal	1,002	11.3	3,082	9.7
Nonagricultural				
Forest	1,621	18.3	5,689	17.8
Minerals, metallic	3,292	37.3	11,990	37.6
Minerals, other	529	6.0	2,446	7.7
Mixed	704	8.0	3,145	9.9
Total	8,839	100.0	31,885	100.0

considered in the light of the labor required to fabricate them, as are animal products. We estimate that the processing of farm crops—grains, cotton, vegetables, and miscellaneous products—required in 1929 approximately 1.7 million workers. Animal products, destined chiefly for consumption as foods but also for other purposes, including wool textiles, were fabricated by one million wage earners. The value added in these processes varies in like proportion and totals some eight and one-half billion dollars for the two groups combined.

In the processing of forest materials some 1.6 million manufacturing wage earners were employed in 1929.²⁶ Twice this number, and over one-third of all wage earners, were engaged in making goods whose primary materials were metals. Another 529 thousand wage earners processed other mineral products; for example, brick, cement, coke, petroleum. In the fabrication of all minerals some \$14 billion were added to the value of the materials and of this total roughly \$12 billion were associated with metal products.

A final group consists of products so complex or groups so heterogeneous that no allocation according to origin of the basic material was attempted; for example, musical instruments, sporting and athletic goods, chemicals not elsewhere classified. Our estimate is that 704 thousand wage earners were engaged in making these products, with a value added of approximately \$3 billion.

The present classification can be crossed with the classification according to ultimate use. Because of the number of variables, the comparison must be simplified, as it is in Table 10. The chief materials in the manufacture of foods are, of course, vegetable and animal products. Vegetable products are likewise important in the manufacture of wearing apparel and personal goods, especially when measured in terms of number of wage earners employed. Animal products (chiefly wool and silk) are also important materials for this group, and in terms of the value added in their manufacture are even more important than other farm products. Of all the materials used in making consumption goods, vegetable products stand first in rank in terms of the processing to which they are subject; metals are second. Metals are of greatest relative importance in the group of capital goods manufacture. Of the wage earners engaged in making capital goods, 84 per cent work on products of which metal is the primary material.

²⁶ The Census of Manufactures classifies sawmills as manufacturing establishments. Accordingly, the processing of forest materials is merged with much activity frequently considered nonmanufacturing.

Table 10

Number of Wage Earners and Value Added, 1929
 Industries classified according to Source of Material
 and Ultimate Use of Product

Ultimate Use	Source of Basic Material
<i>Division of All Manufactures</i>	(percentage distribution)
<i>Consumption goods</i>	
Employment	Vegetable, 33; metals, 20; animal, 20; forest, 13; other, 14
Value added	Vegetable, 29; metals, 21; animal, 16; forest, 16; other, 18
<i>Capital goods</i>	
Employment	Metals, 84; forest, 10; other, 6
Value added	Metals, 87; forest, 8; other, 5
<i>Construction materials</i>	
Employment	Metals, 43; forest, 34; other minerals, 21; other, 2
Value added	Metals, 49; forest, 23; other minerals, 22; other, 6
<i>Producers' supplies</i>	
Employment	Forest, 51; other minerals, 20; other, 29
Value added	Forest, 43; other minerals, 27; other, 30
<i>Total</i>	
Employment	Metals, 37; forest, 19; vegetable, 19; animal, 11; other, 14
Value added	Metals, 38; forest, 18; vegetable, 17; animal, 10; other, 17
<i>Division of Consumption Goods</i>	
<i>Foods</i>	
Employment	Vegetable, 74; animal, 23; other, 3
Value added	Vegetable, 76; animal, 21; other, 3
<i>Wearing apparel, etc.</i>	
Employment	Vegetable, 40; animal, 37; other, 23
Value added	Animal, 38; vegetable, 34; other, 28
<i>Household goods</i>	
Employment	Metals, 35; forest, 26; vegetable, 15; other, 24
Value added	Metals, 41; forest, 22; vegetable, 9; other, 28
<i>Transportation</i>	
Employment	Metals, 75; forest, 12; other, 13
Value added	Metals, 75; forest, 11; other, 14
<i>Publications</i>	
Employment	Forest, 83; other, 17
Value added	Forest, 89; other, 11

A somewhat more detailed classification than that in Table 10 recognizes the character of the material, separating, for example, other vegetable products from vegetable fibres used in textiles.²⁷ The application of this scheme of classification is more difficult, for the detailed groups make a rigorous division of complex manufactured products a troublesome task. But the results are more informative, in that they distinguish the more important materials. The eight groups are shown in Table 11.

Iron is the chief material used in manufacturing. In some form or other it is probably included among the materials or

Table 11

Number of Wage Earners and Value Added by
Manufacture, 1929

Industries classified according to Basic Material

Basic Material	Number of Wage Earners		Value Added by Manufacture	
	Thousands	Per cent	of dollars	Per cent
Vegetable products, other than fibres	689	7.8	3,358	10.5
All fibres	1,456	16.4	3,440	10.8
Animal products	548	6.2	1,818	5.7
Wood	1,620	18.3	5,689	17.8
Iron	2,729	30.9	9,873	31.0
Nonferrous metals	563	6.4	2,117	6.6
Nonmetallic minerals	530	6.0	2,445	7.7
Mixed	704	8.0	3,145	9.9
Total	8,839	100.0	31,885	100.0

supplies of almost every manufacturing industry. In many industries it is the basic material of manufacture, the material that gives form and character to the product. Over two and a half million workers, that is, over 30 per cent of all manufacturing labor, were employed in 1929 in making goods out of this basic material. This labor expenditure in manufacturing is one of the requirements of an 'iron age'.²⁸

²⁷ This classification is similar to that used in the Canadian Census of Manufactures.

²⁸ In some degree, this cost arises from the manufacture of products for export for which other goods and services are received in exchange. In terms of value, the exports of various iron and steel products in 1929 exceeded imports of similar products by \$1,258 million.

The changing structure of manufacturing production has been marked by the increasing importance of the fabrication of iron. In 1929, 82 per cent of all pig iron was converted into steel; in 1899, 72 per cent. The value added in manufacturing iron and steel products was \$9 billion in 1929; \$1 billion in 1899. In contrast to this ninefold increase, the value added by all other manufactures in 1929 was but six times that of 1899.²⁹ In 1899 the manufacture of iron and steel products contributed 21.5 per cent of all value added. By 1929 the relative advance of steel production had raised this ratio to approximately 30 per cent.

The manufacture of products from wood required in 1929 over one and one-half million wage earners, and about the same labor force was engaged in manufacturing processes whose raw materials are fibres, chiefly of course the textile industries. Only one-half million wage earners processed other vegetable materials, for the most part foodstuffs, though the increase in value through this processing was almost as great as that resulting from the manufacture of products from fibre. In part this relatively greater value in foodstuffs probably arises from distribution costs borne by the manufacturer.³⁰

As mentioned above, the character of our comparison tends to overemphasize the importance of major materials. Where a material plays a secondary or minor role in the manufacture of a given commodity, it is not associated with that product in the compilation just made. For example, chemical products are perhaps the most widely used of all materials, though in value they may be relatively minor. Hardly an industry

²⁹ The value added figure of \$9 billion here cited is slightly less than that given in Table 11 because of the omission of several small industries. Since the Bureau of Labor Statistics index of the wholesale prices of metal and metal products increased but slightly over this period (4.4 per cent) we may conclude that changing price levels have no serious effect on the comparison. In physical volume terms pig iron output in the United States increased threefold between 1899 and 1929, the output of steel ingots and castings fivefold.

³⁰ Total overhead costs plus profits (including salaries) per wage earner were \$3,300 in 1929 in the Food and Kindred Products Group of the Census as against \$1,400 for Textiles and their Products. Per capita wages also were lower in the textile industries.

exists but employs these products either directly or indirectly. They spread throughout the entire range of manufacturing operations. Like the fuels, they do not give the dominant character to a product; they are contributory. Frequently the least expensive of the raw materials of manufacturing, they are just as frequently among the most essential. Without them, much manufacturing activity would cease. Although these chemicals are of such prime importance to manufacturing, our methods of classification tend to subordinate them. Their true significance must be measured against other standards.

SUMMARY

To create the manufactured product of 1929 required the combined effort of many men, working with an accumulated capital supply of many years' contriving. Men, machines, and basic materials comprise the economic resources that make manufacturing production possible. The present survey has been concerned with the allocation in 1929 of these productive resources among four classes of manufactured goods. The method of analysis has called for the division, according to these groups, of data on certain measurable aspects of manufactures: (1) gross value of product and elements of cost, (2) factors relating to labor supply, (3) factors relating to capital supply. The analysis of these data tells us the directions in which productive energies were expended, how these resources were allocated in the creation of various types of goods, what types of materials required more processing and what were the costs of processing, and at what stages of manufacturing these resources were utilized.

In 1929 by far the greater part, approximately 70 per cent, of productive activity can be associated with the manufacture of goods destined for human consumption. The other 30 per cent was devoted to making goods eventually used for capital purposes.

In the analysis of the manufactured product we designate

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approximately 10 per cent of the total (the percentage varies with the criterion chosen) as manufactured construction materials, another 10 per cent as producers' supplies. These two groups are considered to be mixtures of capital and consumption goods. The rest, approximately 80 per cent of the total, can be clearly identified as destined either for capital or for consumption use. Operations contributing to the manufacture of these clearly identified consumption goods are reflected in measures of 60.3 per cent of total gross value of product and 57.5 per cent of total value added by manufacture. The corresponding figures for the capital goods group (other than construction materials) are 19.8 per cent of value of product, 22.1 per cent of value added. The differences reflect the more important role played by materials in the total sales of consumption goods.

One general conclusion from the measures presented in the tables of this chapter is that there is much similarity in the allocation of economic resources among the types of goods studied. In general, the ratios for the various items do not differ widely.

If we are to summarize some of the more outstanding distribution patterns we should recall the relative importance of the capital goods share of aggregate wages and relatively low percentage of total overhead other than salaries plus profits. Of number of wage earners and man hours of employment a larger share (relative to output) falls to the capital goods group. On the other hand, in the allocation of fixed capital, the minor groups, construction materials and producers' supplies, have the greater percentage of the total relative to their share in other items. This is a gain won not at the expense of the capital goods group, but largely by a reduction in the percentage identified with consumption goods. Only one-half of total fixed capital is identified with this group. In the total of all circulating capital, however, the consumption goods group has its usual share, if not more. The share of the capital goods industries in aggregate capital

is unusually low. In the total of all horsepower capacity of primary movers, however, the percentage associated with the capital group is high. Even then the share is not increased over the usual ratio by as much as are the shares of construction materials and producers' supplies. The lowest relative ratio for horsepower is in the consumption goods group. Indeed, of all the items for the consumption goods group studied, the relative share of total horsepower is the lowest.

When we analyze these several groups in further detail we find that of the various types of manufactured consumption goods considered, foods and personal goods (clothes and equipment) are the largest items, with household supplies and transportation goods of almost equal importance. Striking differences in the allocation of different productive resources are revealed in these smaller groups, for there is less of the offsetting of opposite relationships that serve to dampen the contrasts in the broader groups.

About 65 to 70 per cent of manufacturing activity is centered in industries that may be classified as 'final stage'—industries whose products receive no further processing within the manufacturing structure.³¹ Again this percentage varies from item to item: it is highest for salaries paid and number of salaried employees, lowest for horsepower investment. A much higher percentage of consumption goods manufacture comes from final-stage industries, particularly in the food subgroup. Capital goods, on the other hand, appear less frequently as finished products. Among consumption goods, transportation products have a similarly extensive background within the manufacturing system.

Capital goods, construction materials, consumers' transportation goods, and a few others are durable goods. These products of long service life, taken together, account for some 47 per cent of all value added, 55 per cent of total wages. Durable consumption goods are about one-third of

³¹ In certain industries only a portion of the products are classified as finished (see Ap. I).

all durable goods, but less than the total of semidurable (consumption) goods. Transient goods are approximately equal to the other two consumer divisions combined except for the items wages and number of wage earners.

Finally we have examined the products of manufacturing industries according to the source of the basic raw materials. As might be supposed, the basic materials of most manufactured goods are minerals. Particularly is this true of capital goods. Approximately 43 per cent of all manufacturing wage earners are engaged in fabricating mineral products; the ratio is 84 per cent for capital goods alone. The processing of agricultural products of all kinds required 30 per cent of all wage earners; forest products some 18 per cent, mixed products the rest. Nonfarm materials receive the relatively greatest degree of fabrication. We estimate that in 1929 farm products entering the manufacturing system were approximately doubled in value through processing (values at the factory stage) whereas nonfarm products increased in value some six times.

The purpose of this chapter has been to appraise the budgeting of the nation's productive resources in the manufacturing field. This task has been approached with hesitation. To provide the figures for 1929 alone has meant the forecast of the use made of commodities unfinished at the time the Census records were compiled. It has required certain assumptions as to equivalence of cost within given industries. It has presupposed the easy identification of consumption and capital goods, of finished and unfinished goods, durable and nondurable, farm and mineral. These and other problems have been considered with as much care as possible. Close inspection and very often extensive calculations have provided the industry divisions (Ap. I) that in turn support the totals presented above. Despite the inexactness of the estimates they remain our best approximations to the aggregates we wish to determine. As such, they help to define the

roles of capital and consumption goods and related products in the manufacturing structure.

The second phase of the analysis of the structure of manufactures is to determine, as of 1929, the importance of various elements of manufacturing cost and the relative use of labor or capital, and to examine the industrial differences in these relationships. The measures described thus far contribute materially to this analysis, but we shall also present in the next chapter measures constructed for the purpose of exploring industrial variations in these aspects of the manufacturing structure. Taken together we believe the measures add materially to existing information about the interrelations of productive factors in manufacturing activity.