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## CHAPTER I

### CONSUMPTION AND THE STANDARD OF LIVING

BY LEO WOLMAN

#### I. THE STANDARD OF LIVING

The surprising sequence of events in the United States since 1922 has placed notions of the standard of living at almost the center of current economic thinking. The observed revolution in the things people buy and use in this country has directed attention to the neglected problems of consumption and has revived in a new guise traditional theories of economic progress. There are many now who are not content to describe changing standards but who find in them the source and mechanism of still further improvement. Although this way of looking at economic processes has had its widest currency here and is unquestionably in large measure a reflection of American conditions, it has had its repercussions abroad as well, and has in other countries won not only interest but also some assent.

In response to this persistent curiosity regarding the level of material well-being, considerable ingenuity has been employed in devising comparative measures of the rise or decline in prevailing standards of comfort. Since all inquiries of this nature do not proceed from precisely the same problem, they do not yield indexes of the same type. Those which are concerned with the relative changing status of the various classes of the population produce charts and tables showing the distribution of wealth and income among those who receive income and hold property. Others start with the question of the sufficiency of prevailing incomes of certain classes in the community to support a minimum, decent, or an American standard of life, and end with comparisons between the well-known ideal budgets, procurable at specified costs, and the incomes available for their purchase. Still others limit themselves to tracing the changing relation between income and the prices of the commodities people buy.

Measures of this last type are commonly known as real earnings, or money earnings corrected for changes in prices. They may be further described as measures of the purchasing power of money earnings. They purport, usually, to show the amount of a fixed budget that can, from time to time, be purchased with a given money income. They reveal the degree to which money income lags behind changing prices or precedes them, and are, accordingly, regarded as indicative of the losses

or gains in material standards sustained by the members of various income groups.

Two elaborate recent indexes of real earnings in the United States illustrate the character and results of this type of measurement. Both cover the period beginning long before the war and ending somewhere in the postwar years. One<sup>1</sup> is limited to real earnings in manufacturing industries, the other<sup>2</sup> includes manufacturing, transportation, ministers, teachers, and public employees. While these two measures of real earnings differ radically in method of construction and in the materials they contain, both indicate the existence of a much higher level of real earnings after 1922 than had existed before, the new postwar level exceeding the heights of such peak years as 1916 and 1920.

Among individual manufacturing industries there are, as is to be expected, great variations in real earnings. Such variations as are shown are far from easy to explain and can probably be understood only in connection with the details of the economic and financial history of these industries during the period under discussion. For 20 of the 29 years, in the period from 1899 to 1927, the workers of the automobile industry, for example, were presumably below their 1914 level of real annual earnings, while both the steel and woolen goods workers were nearly always above that level. The rise of 38 per cent over 1914, achieved by the automobile workers in 1924, was exceeded by the woolen workers in 1923 and 1916, by the men's clothing workers in 1923, and frequently by the steel workers, notably in 1920, 1923, and since 1924. The discovery of variations of this nature may easily throw doubt on the validity of index numbers of real earnings as they are currently constructed and used.

There are, of course, many technical problems involved in sound discussion of measures of real earnings. But aside from that aspect of the matter there remains probably the more important question of the adequacy of such measures for the purpose in hand. It is certainly true that under some conditions, at least, the movements in real earnings are not a satisfactory barometer of the changes in the material standards of the people of a community. In the form in which it is generally used, the measure of real earnings represents the arithmetical relation between per capita or individual income and prices or the cost of living. While this relationship is unquestionably a significant one, both elements of the equation may be, and often are, defective.

The prevailing unit of economic life in the United States, and nearly everywhere else, is the family. The relation between individual earnings

<sup>1</sup> See Chap. VI, Labor, sect. 2, p. 433 and Chap. XII, National Income, p. 771. See also forthcoming census monograph by Paul F. Brissenden on real earnings in American manufacturing industries.

<sup>2</sup> Paul H. Douglas, "The Movement of Real Wages and Its Economic Significance," Supplement, *American Economic Review*, Vol. XVI, No. 1, March, 1926, p. 17.

and family income is not known and is consequently not allowed for in most indexes of real earnings. This relation is, moreover, a variable one that has changed in the past and is likely to change in the future. No method has yet been discovered for combining the various known individual incomes into a satisfactory family income, except that of the direct study in the field of the incomes of a limited number of families. Both individual and family incomes are in a large number of instances supplemented by other income, either from property or in the form of what are sometimes known as free goods—services furnished wholly or partially without cost by the state. It is, as will be noted later,<sup>3</sup> almost impossible to estimate accurately the flow of labor's income from property, but it is believed to be a substantial and increasing item, particularly in this country.

Free income provided out of public expenditures, and also in increasing measure by private endowment, has become in modern times a factor of fundamental importance. In nearly all of Europe, state contributions to family income in the form of health and unemployment insurance, old age pensions, family allowances, and other gratuities of the same kind have grown to such proportions that it is no longer feasible or accurate to discuss real earnings without making proper allowance for these additions to private income.<sup>4</sup> While the United States has lagged behind other countries in this respect, the amount of such expenditure has without doubt risen in this country as well. Estimates of its volume cannot pretend to be complete, but they indicate the trend and the character of services so furnished.

**Public Expenditures for Social Services.**<sup>5</sup>—The data on public expenditures here included are in the main limited, by necessity, to the expenditures by the state and local governments whose financial statistics are contained in the reports of the United States Bureau of the Census on the financial statistics of states and of cities with a population of over 30,000. Some Federal appropriations, expended through the states and cities, are included in these figures. Certain types of private expenditures, particularly in the field of education, are, where they can be segregated and measured, also included. No hard and fast line can be drawn between public services that are social, and contribute to the well-being of the masses of the people, and those that are not. A case might, for example, be made for the inclusion of expenditures on highways, which in the 48 states rose from 23 cents per capita in 1915 to \$1.35 in 1926 and in the cities with a population of over 30,000 from \$2.06 in 1915 to

<sup>3</sup> See Chap. VI, Labor.

<sup>4</sup> For a most interesting discussion of this point see Henry Clay, "The Authoritarian Element in Distribution," *Economic Journal*, March, 1927, p. 1.

<sup>5</sup> The material for this section was prepared by Isador Lubin, of the Institute of Economics of the Brookings Institution.

\$3.73 per capita in 1926. The total expenditure for this purpose from these two sources in 1926 was nearly \$300,000,000 and it is steadily mounting. These figures were, however, omitted. Expenditures, likewise, for sewers and sewage disposal, street cleaning, refuse collection and disposal were omitted, although they amounted for the cities in 1925-26 to \$124,000,000. The expenditures included in this discussion are those incurred for education, charity, recreation, and health and sanitation.

Of these social services, education not only absorbs the greatest income but it appears to be growing at a much more rapid rate than the rest. The gross expenditures for this purpose are estimated to have increased from three-quarters of a billion in 1913-14 to two and three-quarters billions in 1925-26. The details are shown in Table 1.

TABLE 1.—ESTIMATED EXPENDITURES FOR EDUCATION IN THE UNITED STATES  
(In thousands of dollars)

	1913-14 <sup>a</sup>	1914-15 <sup>b</sup>	1917-18 <sup>c</sup>	1921-22 <sup>d</sup>	1925-26 <sup>e</sup>
Public elementary schools (including kindergartens).....	486,167	530,320	599,383	1,163,374	1,328,396
Public high schools.....	68,911	75,141	162,876	417,297	697,912
Private elementary schools.....	52,042	51,683	54,989	77,398	135,680
Private high schools.....	14,572	14,590			
Other private and public secondary schools.....	13,501	12,746	34,025	32,808	54,909
Universities and colleges:					
Public.....			65,316	128,117	174,481
Private.....	95,154	101,753	71,739	144,698	232,919
Normal schools.....	15,086	15,885	20,415	20,649	28,437
Teachers colleges.....	<sup>k</sup>	<sup>k</sup>	<sup>k</sup>	18,145	33,374
Commercial and business schools.....	8,403	9,164	24,572	<sup>k</sup>	<sup>k</sup>
Reform schools.....	8,654	9,039	10,158	18,953	22,304
Schools for deaf.....	4,169	4,235	5,135	9,530	8,053
Schools for blind.....	2,477	2,618	2,932	2,894	3,838
Schools for feeble-minded and subnormal.....	8,753	11,209	4,567	15,094	18,364
Government schools for Indians.....	3,818	3,852	3,328	5,894	5,392
Total.....	781,707	842,235	1,054,851	2,054,851	2,744,059

<sup>a</sup> Data from United States Department of Interior, Bureau of Education, *Report*, 1916, Vol. II, p. 9.

<sup>b</sup> *Ibid.*, 1917, Vol. II, p. 9.

<sup>c</sup> Data from United States Department of Interior, Bureau of Education, *Bulletin*, 1920, No. 31. *Statistical Survey of Education*, 1917-18, p. 5.

<sup>d</sup> *Ibid.*, 1924, No. 38, p. 2.

<sup>e</sup> *Ibid.*, 1928, No. 12, p. 8.

<sup>f</sup> Includes schools for feeble-minded.

<sup>g</sup> Includes city normal schools, city schools for deaf, city schools for feeble-minded and subnormals, and city evening schools.

<sup>h</sup> Includes city schools for deaf and city schools for feeble-minded and subnormal.

<sup>i</sup> Includes kindergartens.

<sup>j</sup> Includes professional schools.

<sup>k</sup> Data not available.

<sup>l</sup> Year 1927.

Some of this does not represent free education. American universities and professional schools spent in 1925-26, \$407,400,000, of which \$101,499,000 was returned to them in the form of tuition and fees.<sup>6</sup> Of the \$190,589,000 spent by private elementary and high schools it can only be estimated that from one-third to one-fourth was not covered by tuition receipts. What evidence there is appears to indicate that roughly \$2,500,000,000 of the total spent on public and private education in the United States in 1925-26 represents free education. The per capita expenditures for pupils in the public elementary schools in 1926 were \$63.31; in public high schools, \$195.74; and in universities and colleges, \$423. Total expenditure for education increased by 250 per cent between 1913-14 and 1925-26.

Almost half of this increase was for free elementary schools. At the same time enrollment in elementary schools rose from 17,934,000 in 1913-14 to 20,984,000 in 1925-26, or about 17 per cent. There has consequently been a great increase in the expenditure per child.<sup>7</sup> The striking increase in expenditure for education, however, took place in the appropriations for high-school education. They increased tenfold from \$68,911,000 in 1913-14 to \$697,912,000 in 1925-26, while the total enrollment increased by more than 200 per cent from 1,218,000 to 3,757,000. The number of college and university students likewise grew with great rapidity from 325,219 to 822,895 during the same period. It is estimated that the expenditure for free college and university education increased in little more than a decade by nearly 350 per cent.

Compared to the amount spent on education, the expenditures on libraries, exclusive of buildings, were very small and amounted, according to estimates of the Library Association, to \$35,347,156 in 1926. Estimates of the United States Bureau of Education place the amount spent on libraries in 1913 at \$15,780,000, so that per capita expenditures for this purpose have risen 87 per cent since before the World War.

Recreation accounted for public expenditures in 1926 of more than \$50,000,000 which represented an increase over 1913 of 146 per cent. In the conservation of health, including outlays for the prevention and treatment of communicable diseases, particularly tuberculosis, for the conservation of child life, and for such sanitary and health work as the provision of free antitoxins, the known public expenditures of states and cities rose from \$22,000,000 in 1915 to \$57,000,000 in 1926. The greatest increase in this category was in the appropriations for the conservation

<sup>6</sup> Estimate of the Bureau of Education, United States Department of Interior.

<sup>7</sup> One item in the rapid increase in the total expenditures of recent years has been the increase in the amount expended for grounds and buildings and contents. Annual capital outlay per pupil in average daily attendance amounted only to \$7 from 1916 to 1918. By 1925 this amount had increased to \$21.86 and stood in 1926 at \$20.47. United States Department of Interior, Bureau of Education, *Bulletin*, 1928, No. 12, *Statistical Survey of Education, 1925-1926*.

of child life. It should be pointed out, however, that these figures do not include all Federal appropriations for sanitation and public health. Federal expenditures in 1926 for all health purposes amounted to \$131,000,000,<sup>8</sup> but of this \$118,000,000 went to the United States Veterans' Bureau.

The combined expenditures by the larger cities and the 48 states for hospitals were \$144,819,000 in 1926, of which the states spent \$106,000,000 and the cities \$39,000,000. But this amount covers a relatively small fraction of the total spent on free hospital service in the United States. An estimate made by Dr. Louis I. Dublin<sup>9</sup> places the aggregate cost of maintaining general hospitals for the physically ill in the United States at about \$500,000,000 a year. The income of these hospitals from patients is estimated to cover roughly two-thirds of their total expenditures. The sum of \$166,000,000, therefore, measures the free services of these hospitals. It is estimated further that, of the total expenditures by states and cities, \$42,000,000 were spent for general hospitals and more than \$100,000,000 for institutions for the insane. Something more than \$120,000,000, therefore, of the income of general hospitals must have come from private endowments and contributions.

Public expenditure for charity is, in this country, not large. The statistics are again limited to the 48 states and larger cities, but, within this group, include the cost of caring for orphaned children and the blind, deaf, and mute, together with expenditures for outdoor poor relief, the support of poor in institutions, and other charities. The total amount so spent was \$34,000,000 in 1915 and \$58,000,000 in 1926. Small as this total is, it is not surprising, since the distribution of charity is, in the United States, almost exclusively the function of private agencies.

The remaining item, mothers' pensions, is reminiscent of European practice. Almost the newest form of public social service, the total expenditure for this purpose was nearly \$13,000,000 in 1926; of which more than \$2,500,000 was made by the states and slightly more than \$10,000,000 by the larger cities of the country. Nearly 80 per cent of all outlays for mothers' pensions is made by cities with a population of over 500,000. The statistics for cities do not include this item previous to 1919, but the cost before that time was slight, since the total expenditure by the 48 states for this purpose amounted in 1915 to only \$108,000.

It has already been pointed out that these measures of expenditure for social services are, in the main, limited to the outlays by the 48 states and the larger cities of the country. Except for education and libraries, no attempt has been made to estimate either the expenditure of the smaller cities or the amount of free services that flow from private sources.

<sup>8</sup> James A. Tobey, *The National Government and Public Health*, Studies in Administration, The Institute for Government Research, 1926, p. 353.

<sup>9</sup> "What Price Doctors?" *Harper's Magazine*, November, 1927.

It is highly probable, therefore, that these figures grossly underestimate not only the absolute amount of such free services but also the rate of increase during the past decade. Even with these omissions, however, the total expenditures, shown in Table 2, appear to be an item of great significance in the income of the citizens of the country.

TABLE 2.—TOTAL EXPENDITURES FOR FREE SOCIAL SERVICES BY 48 STATES AND CITIES WITH A POPULATION OF OVER 30,000

Service	Expenditure	
	1915	1926
Education.....	<sup>a</sup> \$708,164,000	<sup>a</sup> \$2,499,000,000
Libraries.....	<sup>a</sup> 15,467,000	<sup>a</sup> 35,874,000
Recreation.....	21,295,000	53,969,000
Conservation of health.....	21,950,000	56,357,000
Hospitals.....	58,005,000	144,819,000
Charities.....	34,347,000	58,211,000
Mothers' pensions.....	<sup>b</sup> 108,000	12,705,000
<b>Total.....</b>	<b>\$859,336,000</b>	<b>\$2,860,935,000</b>

<sup>a</sup> These figures include estimates of expenditures from private sources, after deducting for the payment, in the case of educational institutions, of tuition and fees.

<sup>b</sup> This figure does not include city expenditures, for which there are no 1915 data.

This imperfect estimate of the amount spent for free social services shows a rate of increase over ten years much greater than either the rate of growth of the total population or of the national income. The estimates of expenditures for free services constitute 2.4 per cent of the estimated national income in 1915 and 3.4 per cent in 1926.<sup>10</sup>

**Hospital Facilities.**<sup>11</sup>—The great advances constantly made in this country in the facilities serving the interests of health, only noted in passing in the preceding discussion, are strikingly described in the available statistics of hospital service.<sup>12</sup> The record of growth of the number of hospitals and beds, presented in Table 3, shows an increase in these facilities far more rapid than the increase of population. While these total facilities are not free, there is no reason to believe that the proportion of free service has not increased *pari passu* with the growth of total facilities. The marked growth in the number of state and Federal hospitals and in the number of beds added would appear to confirm this belief.

<sup>10</sup> The estimates of national income here used are those made by the National Bureau of Economic Research.

<sup>11</sup> The material for this section was prepared by Homer F. Sanger, of the Council on Medical Education and Hospitals of the American Medical Association.

<sup>12</sup> Unless otherwise indicated, the statistics in this section are based on reports of the Council on Medical Education and Hospitals of the American Medical Association.



TABLE 3.—GROWTH OF HOSPITALS, 1909 TO 1927<sup>a</sup>

Year	Federal hospitals		State hospitals		Other hospitals		Total	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
1909.....	71	8,827	232	189,049	4,056	223,189	4,359	421,065
1914.....	93	12,602	294	232,834	4,650	287,045	5,037	532,481
1918.....	110	18,815	303	262,254	4,910	331,182	5,323	612,251
1923.....	220	53,869	601	302,208	6,009	399,645	6,830	755,722
1927.....	301	60,444	592	354,786	5,914	438,088	6,807	853,318

<sup>a</sup> These statistics regarding hospitals include the hospital departments that are sometimes maintained by institutions, such as prisons and custodial homes, for the care of sick or injured inmates or occupants. In 1923 there were 767 such hospital departments with an average census of 24,926; by 1927 they had been reduced to 530 departments having an average census of 21,930 patients.

From the date of earliest record, the number of hospitals has increased rapidly and with remarkable regularity until 1923, after which there appears a slight decrease in the number of hospitals but the usual increase in capacity. Taking into account the decrease of 237 hospital departments from 1923 to 1927, there must have been a gain in the number of actual hospitals. Measuring the growth by the number of beds added annually, the rate has been almost uniform, or a net gain of roughly 25,000 beds a year, at least from 1909 to 1927.

Not all hospitals are available alike to all the sick and injured of the community. Some are restricted to Government or other limited classes of beneficiaries, such as those of the Veterans' Bureau, the Army, Navy, and Marine hospitals, or the state nervous and mental institutions. The growth of community hospitals, institutions that are open to the whole community, is a more useful index of the available hospital capacity of the country. The number of such hospitals has increased from 4,013 in 1920 to 5,639 in 1928, and their capacity in the same period from 311,159 to 442,913 beds. The important feature of this growth is that it has been widespread and has progressively meant the creation of hospital facilities where none existed before. Thus, the percentage of the 3,076 counties in the United States that have hospital facilities increased from 44.0 in 1920 to 57.4 in 1927. Much of this development has occurred in what were probably the backward areas of the country. In 1920, 25.4 per cent of the counties of Alabama had hospitals and by 1927 this percentage had risen to 53.7; in Arkansas the rise was from 24.0 to 42.6 per cent; in Georgia from 18.4 to 30.4 per cent; in Mississippi from 26.8 to 45.2 per cent; in Oklahoma from 35.0 to 51.9 per cent.

Probably the most illuminating index of the growth of hospital facilities is the ratio of population to the number of beds for community use. This ratio in the country as a whole and in the main geographical divisions is shown in Table 4. In 1920 there were 340 persons per bed

TABLE 4.—RATIO OF POPULATION TO BEDS

Geographical division	1920	1925	1927
Total United States.....	340	291	270
North Atlantic.....	242	216	198
South Atlantic.....	508	407	430
North Central.....	355	301	267
South Central.....	705	544	508
Western.....	211	218	209

as contrasted with 270 in 1927.<sup>13</sup> It is interesting to note that Wisconsin has the lowest ratio of population to beds, closely followed by Nevada, Colorado, and California, and by New York, Massachusetts, and New Jersey. The states showing the highest ratio are South Carolina, Oklahoma, Georgia, Arkansas, Mississippi, Alabama, and Kentucky.

The growth in the number and capacity of American hospitals has been accompanied by a marked increase in their efficiency. Measured by such intangibles as the improvement in medical education and the rise in the standards of the medical profession, the progress in efficiency has unquestionably been great. But measured, also, by such objective factors as the amount of hospital equipment, the advance has been equally great. The following tabulation shows the increase in the past five years in the number of clinical laboratories and of X-ray departments in hospitals:

	1922	1927	Per cent increase
Hospitals reporting clinical laboratories.....	3,035	4,357	43
Percentage of all hospitals.....	44	64	
Hospitals reporting X-ray departments.....	2,841	4,387	54
Percentage of all hospitals.....	42	64	

There were at the same time 2,091 physical therapy departments reported in hospitals in 1927, the total beds in those hospitals numbering 354,019. Equal progress has marked the introduction of occupational therapy, social service, dietary, and other departments.

The acquiring of these facilities means more than the buying and setting up of so much machinery. It means the planning and construction of new buildings; the remodeling and enlargement of existing plants; and the addition of thousands of scientifically trained persons

<sup>13</sup> Estimates of state population were based on estimates of the United States Bureau of the Census. Wherever available, figures from state censuses were used, since the state figures are of later date.

to operate these departments. And the growth has been not only in the new facilities, but also in the expansion and improvement of departments already in use.

**The Cost of Living.**—The second element in the formula of real earnings is the cost of living. The ordinary measure of the cost of living is the weighted average of the retail prices of the many commodities and services that constitute the budget of the persons or group whose income is being studied. As such it is inevitably composed of many arbitrary elements. It is by its nature a rigid index, not sensitive to changes in people's ways of living, and like all indexes of prices or of production it cannot allow for such changes in quality as are frequently tantamount to reduced or increased expenditure. Such measures have their rough uses. But the conclusions to be drawn from them require confirmation from other and different sources.

Aside from these technical reflections on the nature of measures of real earnings, there remains still the fundamental methodological problem, whether simple arithmetical formulæ of this sort can always be expected to throw light on radical changes in material standards within a single country, or on the differences between prevailing standards in two or more countries essentially unlike in their manner of living. The problem has confronted many investigators and has frequently been settled by resorting to new devices of observation and measurement. In general, these devices have consisted in picking objective standards of living such, for instance, as housing facilities and in noting changes in the quality and amount available for specified groups of wage earners, salaried workers, or unskilled laborers;<sup>14</sup> or in studying directly the facts of consumption; or in discovering phenomena that are easy to find and measure and that are suspected of reflecting improved or lowered material standards.

In their survey of conditions in England, the Committee on National Debt and Taxation was faced with a problem of precisely this nature. Their method of stating their conclusions is, consequently, of interest in this connection. "Pure statistics as to resources on the one side . . . and as to savings on the other," the committee writes,<sup>15</sup> "might lead to a tentative inference that, if anything, rather less was being spent on the average; this would imply that . . . the average standard of living was lower than before the war . . . It is easy to let the comparative figures for rates of wages . . . have too much influence on the mind . . . Further, if adequate statistics as to consumption were available, it seems likely that they would be quite inconsistent with any lower standard of

<sup>14</sup> See in this connection A. L. Bowley and M. H. Hogg, *Has Poverty Diminished*, London, 1925, and L. Houghteling, *The Income and Standard of Living of Unskilled Laborers in Chicago*, Chicago, 1927.

<sup>15</sup> Cmd. 2,800, London, 1927, pp. 11ff.

living . . . Altogether, in the present rather conflicting state of the evidence to be drawn from the statistics, we find ourselves thrown back, as a matter of common sense, upon the evidence of our own and other people's observations . . . For our part, we think that the signs of improvement, which have impressed many observers, are convincing, although it is doubtless possible to rate them too high."

TABLE 5.—DEATH RATES PER 100,000 FOR TUBERCULOSIS OF THE RESPIRATORY SYSTEM

Year	U. S. Registration states of 1900		Metropolitan Life Ins. Co., Industrial Dept.			
	Males		White males		White females	
	Age 25 to 44 years	Age 45 to 64 years	Age 25 to 44 years	Age 45 to 64 years	Age 25 to 44 years	Age 45 to 64 years
1900	275.4	249.5	.....	.....	.....	.....
1910	248.5	242.5	.....	.....	.....	.....
1911	"	"	481.1	408.4	264.8	145.8
1912	"	"	455.8	387.8	239.8	135.8
1913	"	"	447.2	414.2	222.2	132.2
1914	"	"	445.0	434.5	218.1	136.6
1915	"	"	410.2	401.1	211.0	135.0
1916	"	"	390.4	397.3	205.2	122.4
1917	"	"	389.9	408.4	195.7	121.6
1918	"	"	356.0	393.0	203.7	119.6
1919	"	"	275.4	308.0	184.6	109.3
1920	154.1	165.6	209.5	244.3	162.2	97.3
1921	128.6	146.4	172.6	203.0	130.8	81.8
1922	126.1	143.9	174.9	217.2	127.0	80.8
1923	123.6	142.5	176.5	211.1	124.5	81.4
1924	118.5	132.6	157.8	197.2	113.2	74.0
1925	112.9	134.4	149.6	189.0	106.5	67.0
1926	112.1	137.2	148.7	198.6	101.0	67.4

" Data not available.

Many students of the standard of living have noted the persistent connection between prevailing economic conditions and the ebb and flow of mortality and morbidity rates. The specific cases of diseases arising out of undernourishment are well known.<sup>16</sup> The relation between infant mortality and economic insufficiency may not have been proved beyond a reasonable doubt, but its existence is generally conceded by students of the subject. Likewise the astonishing drop in the American death rate for tuberculosis after 1917, shown in Table 5,<sup>17</sup> is regarded by many as convincing evidence of the existence of improved material standards

<sup>16</sup> See section on Food Consumption, pp. 24-51.

<sup>17</sup> Prepared by Dr. A. J. Lotka, of the Metropolitan Life Insurance Co.

among American workingmen in the form of better housing, fuller nourishment, greater leisure, and a higher level of medical care.<sup>18</sup>

**Consumption.**—The use of statistics of consumption as measures of changing material standards also involves problems of great complexity. It is not always possible to find a satisfactory unit of consumption, since monetary units involve difficulties here as elsewhere. The problem of dating changes is, as will be seen later, not always soluble. Nor can statistics of consumption be so classified as to permit the allocation of the total amount of any commodity used by everybody among the various economic classes in the community. The best that can be done, under the circumstances, is to judge, from the sheer magnitude of the recorded change in consumption, how far it could have occurred without general participation in it. Making such judgments is often practicable; but where it is not, there is no easy way out.

The following brief and tentative surveys of the use of food, manufactured goods, automobiles, and housing in this country point at least to one useful and important conclusion. They all indicate such radical modifications in the habits of American consumption in recent years as to invalidate the results obtained from budgetary studies made before these changes had become effective. It is clear that fresh studies of family consumption would not only correct erroneous impressions, but might also, if properly made, throw light on the sources and magnitude of prevailing family incomes, a matter with regard to which we are still much in the dark.

## II. FOOD CONSUMPTION<sup>19</sup>

National statistics of food production, stocks, consumption, and wastes are limited, defective, and difficult to interpret. Still more so is the information bearing on different groups within the population, and on the psychological factors in food consumption. Accordingly it is necessary, in discussing recent economic changes in respect to food requirements and consumption, to speak mainly in terms of trends and tendencies.

**The Problem of Malnutrition.**—A fundamental question is the extent and trend of malnutrition or undernourishment. These terms, here used interchangeably, apply to a condition which may be due to physical defects, disease, methods of eating, or psychological factors. Much of it is owing either to ingestion of too little food or to diets that are

<sup>16</sup> For a discussion of this problem see "Economic Status and Health," *Public Health Bulletin*, No. 165, Treasury Department, Washington, 1927, particularly pp. 10, 13, 15, 67.

<sup>19</sup> This section is printed substantially as it was written by Joseph S. Davis, director of the Food Research Institute, Stanford University, California, assisted by Dr. Alonzo E. Taylor and other colleagues.

qualitatively unsatisfactory for proper nutrition. Certain well-known diseases (beri-beri, scurvy, and rickets) are caused, wholly or in part, by dietary deficiencies. Even where these do not result, malnutrition tends to increase the incidence of disease, to raise the mortality rate, to impede normal physical growth and development, and to reduce ability to work.

No country is without its ill-nourished class, which is by no means restricted to the poor; but the extent of the class and the degree of subnormality vary greatly from country to country. Judged by either test, the United States has probably never ranked low among the nations. But we have no means of measuring either the present extent of malnutrition or the degree to which it has increased or declined. It would appear, in the light of our present knowledge of nutrition in its relation to health, to be much more prevalent than had formerly been supposed. It is especially prevalent, and often especially serious, among pregnant and nursing mothers, and in infancy and childhood. With periodic health examinations, especially among children, increasingly common, more frequent, and more searching, more malnutrition is detected than formerly. Nevertheless, there is reason to believe that, on the whole, the trend has been downward in recent years until the present extent is smaller than before the war. But one must be content with inferences and indications; conclusive evidence is not readily available.

According to the newer knowledge of nutrition, dietary deficiencies resulting in malnutrition and disease are more largely due, at least in the United States,<sup>20</sup> not to calculable inadequacy in total calories or to shortage in intake of either proteins, carbohydrates, or fats, but rather to more insidious defects that have but recently been analyzed.<sup>21</sup>

<sup>20</sup> This is not universally true. J. B. S. Haldane, a prominent biochemist, may be right in saying, in his recent essay on "Vitamins" in *Possible Worlds and Other Papers* (New York and London, 1928), p. 59: "as a matter of fact, about half the human race at the present moment is suffering from partial starvation, and the first requisite for them is to eat more of the cheapest food they can get, vitamins or no vitamins."

<sup>21</sup> Studies of farm diets were made by Funk in 1912-1914, covering 950 families in 14 states, and by the United States Department of Agriculture in 1922-23, covering 1,331 families in Kansas, Kentucky, Missouri, and Ohio, and in 1923-24, covering 86 families in Vermont. These all showed that, on the average, food consumption apparently exceeded liberally calculated requirements by much more than probable wastage. This was true of each of the five elements separately calculated—energy, protein, calcium, phosphorus, and iron. Cf. preliminary report on the second study, by Edith Hawley, (mimeographed), United States Department of Agriculture, *Average Quantity, Cost, and Nutritive Value of Food Consumed by Farm Families*, August, 1925, and her preliminary report on the Vermont material, January, 1927. Dr. Hawley's analysis of the data collected for urban diets in workingmen's families, by the United States Bureau of Labor Statistics in 1918-19, showed, on the contrary, a substandard average in total calories and in all the elements studied except protein. Closer analysis of the wastes, the number of meals bought in restaurants, and other factors, however, might yield different results.

The body requires food proteins out of which it can reconstruct the proteins of which it is largely composed. Many diets contain too little protein, or proteins of inferior quality. The lack of sufficient quantities of certain mineral salts in appropriate combinations is another insidious cause of ill nourishment, resulting in impairment of health or fertility. Common methods of protection against infestation and decomposition reduce the vitamin content of foods, and higher standards of palatability often make for a constipating diet.

It is clear that the causes and corrections of malnutrition are by no means wholly economic. However, certain economic tendencies of the past century, such as increased congestion of population, the decline in home gardens, and the increased availability of cereals, potatoes, and sugar, have tended in the direction of dietary deficiencies in minerals and vitamins. With increased income per capita, moreover, there has been a decreased demand for those portions of cereal grains and animal carcasses which possess nutrients of the greatest dietetic value. The corrections lie partly in making generally available the foods that contain certain elements of which shortages tend to occur, and partly in more widespread understanding of the body's requirements as obtainable from foods.

In both these respects there have been notable gains in recent years. Our knowledge of nutrition has greatly increased, and the knowledge is much more widespread than ever before. Instruction in food values, proper diets, and related phases of home economics, together with physical examinations and advice in schools and clinics, tend to reduce the amount of undernourishment that can be avoided by proper use of available resources. The increased availability, throughout the year, of fresh milk, fresh vegetables, and fresh fruits (which are excellent sources of essential but often slighted food elements), together with higher levels of income which have brought these within reach of nearly all classes, have contributed greatly to more adequate consumption of the "protective" foods and the consequent improvement of the diet in the nutritional sense. Improved sanitation and inspection, together with wider knowledge, have reduced the prevalence of germ transmission by food. Higher incomes have also reduced the prevalence of insufficient food. The gains have inured most to the urban populations, among whom dietary deficiencies have been most common, but they have been shared by considerable portions of the rural population as well. For the most part, such ill nourishment as persists is owing proximately to mismanagement of income, through ignorance or otherwise, or to low income as such.

Subnormal nutrition has probably been commonest among recent immigrants from countries with low food standards, in rural and urban

negro population groups, in large families of the lower-income groups of wage earners and salaried employees, and where a large proportion of low incomes was spent for liquor. Immigration restrictions, negro migration to the North,<sup>22</sup> lower birth rates, and prohibition combined have tended to reduce these causes making for inadequate or unbalanced food consumption. The increasing mechanization of manufacture, transport, agriculture, and construction has reduced the demand for unskilled labor, and increasing opportunities for education and training have made it possible for the younger generation of these groups to move into higher wage classes.

**Declining Food Requirements per Capita.**—For many years there has been a significant and practically continuous trend toward smaller food requirements per capita—in the physiological sense, not the economic. This has been especially the case in the United States, and the tendency has become more pronounced in recent years.

This decline has occurred largely in energy-producing foods, and chiefly in the quantities needed to maintain body heat and furnish energy for active work. There are no indications of appreciable change in the individual requirements for mineral salts, vitamins, and proteins for tissue replacement, or in the energy requirements for carrying on the simple bodily functions. The physiological requirements for growing children have not changed, except as they may be affected by increased activity in sports and by changes in clothing and heating.

Some change in the national per capita requirement for maintenance and growth may have occurred through alterations in the age and sex distribution of the population. Declining rates of infant and child mortality tend proximately to increase the proportion of growing children, but declining birth rates and increasing average longevity of adults tend to increase the proportion of more elderly persons. The net effect of these and other factors may be to decrease the proportion of persons in the age groups (over 11 and under 45) which require more than the average amount of food for purposes other than heat and activity. This was probably true between 1910 and 1920, judging from the census data, but it may not prove equally true for the decade 1920-1930. A decline in the proportion of males to females, such as occurred between 1910 and 1920, makes for reduced per capita food requirements, since in general the female requirement is lower than the male; but the change shown by the census of 1920 was probably owing mainly to reduced immigration and the outflow of former immigrants in connection with

<sup>22</sup> It is reported that the diet of negro workers on southern plantations has been improved in consequence of higher pay and better conditions, established in the effort to resist depletion of the labor force. Cf. *Journal of Home Economics*, September, 1926, Vol. XVIII, pp. 523-525.



the war, and the postwar net inflow of immigrants, despite immigration restrictions, may have prevented a continuance of this decline.<sup>23</sup>

There is probably some reduction in characteristic body weights, to judge from observations of physicians, life insurance companies, and clothing manufacturers and sellers, and the well-known vogue of the slender figure in the case of women. Since it takes less food to attain and maintain lighter body weights, this has probably had some influence in reducing food requirements for storage of fat in adults and for maintaining body weights.<sup>24</sup>

The net effect of these factors has probably been to reduce per capita requirements. It seems clear, however, that the major influence has been exerted by factors making for reduced intake of food-fuel required to furnish working energy and maintain body heat. These factors have arisen out of changes in the conditions of labor and methods of living of the American population, which have been particularly in evidence during the past decade. A few of these factors require special emphasis. The changing proportion of labor in exposed and sheltered occupations, which has been under way for generations, continues now with the movement out of agriculture into the clerical and professional occupations. The progressive mechanization of industry and agriculture has in this latest period revolutionized those occupations requiring the greatest physical exertion. Since 1914 the reduction in the hours of work has been made at more rapid rate than ever before. The widespread use of the automobile, with the rising popularity of the closed car, has hardly been offset by the growing disposition of Americans to indulge in outdoor sports. Finally there has been a decided improvement in the equipment of both industrial and domestic housing that has tended to effect a material conservation of body heat in colder regions and in colder

<sup>23</sup> The following tabulation, from the population census of 1920 (Vol. II, p. 155), is of interest in these connections:

Age group	Percentage distribution, both sexes		Males to 100 females	
	1910	1920	1910	1920
Under 5 years.....	11.6	10.9	102.5	102.5
5-14 years.....	20.5	20.8	102.0	101.9
15-24 years.....	19.7	17.7	101.0	96.8
25-34 years.....	16.5	16.2	109.0	102.1
35-44 years.....	12.7	13.4	111.8	108.9
45-54 years.....	9.1	9.9	115.7	116.7
55-64 years.....	5.5	6.2	112.4	112.8
65 years and over.....	4.3	4.7	101.1	101.3

<sup>24</sup> The reverse has apparently occurred in Germany, where, under stress of restricted food supplies, average body weights declined during the war, and where in postwar years there has been a noticeable tendency to return to the former heavier weights.

weather.<sup>25</sup> The only significant offsetting factor has been the tendency toward lighter clothing.

As a result, the reduction in per capita requirements of food, though not susceptible of calculation, must clearly have reached substantial amounts. While the various factors mentioned have been operative for many years, there have probably been few decades, if any, in which they have exerted a greater influence than in the ten years since the end of the World War.

**Measurement of Food Consumption.**—It is out of the question, at present, to arrive at an accurate measure or even, for most commodities, a convincing statistical demonstration of the reduction in calories consumed per capita, to say nothing of following its course year by year. In tracing foodstuffs from origin to final consumption, enumeration and measurement are lacking to a surprising extent.<sup>26</sup>

Even if food production could be measured, it would not afford an effective measure of ingestion. The caloric content of certain foods, such as meats, varies somewhat with the character of the product—the relative weight of bones, fat, etc. Despite important improvements in recent years, statistics of stocks are far from adequate and dependable. The proportion of waste is variable to a material extent, and a large element of variation occurs in the household itself as well as in channels of distribution; and on food wastes our information is extremely limited and defective. Conclusions as to dietary changes must rest, in large measure, upon skillful observation and inference as well as upon carefully interpreted quantitative data. The conclusions here expressed, even when not

<sup>25</sup> See Housing, Chap. III, Construction, p. 233; and Chap. V, Marketing p. 324.

<sup>26</sup> Even with respect to production, the censuses of agriculture and manufacture have been incomplete or otherwise untrustworthy, and in different degrees from census to census and from commodity to commodity. The agricultural censuses before the war were almost primitive in character. The decennial census of 1920 was taken during a period of transition from war to peace. The biennial censuses of manufacture since the war have been unsatisfactory in respect to many classes of food supplies. The agricultural census of 1925 was incomplete and unreliable at many points, chiefly because of excessive stinting in expenditures. Official and trade estimates of annual production have been greatly improved in recent years, but many rest on quite insecure foundations. Our knowledge of meat production is faulty, especially on account of lack of information on important classes of Federally non-inspected slaughter; of fruits and vegetables, because commercial production is not segregated from noncommercial, and very little is known of the output of home gardens; of milk production, especially because of wide variations in annual outturn per cow and the lack of trustworthy sampling to secure a representative average. The growing multiplicity of food products increases the difficulty of obtaining comprehensive production data. The movement of produce by automobile truck affects the usefulness of data on car-lot shipments. On the other hand, the increasing scope of statistical endeavor, and the growing extent to which food moves through commercial channels, tend to show spurious indications of per capita increase.

explicitly tentative, must be regarded not as definitive but as subject to modification.

**Changing Content of the Diet.**—Raymond Pearl, statistician of the Food Administration, computed the annual average food consumption of the United States, for the six years 1911-12 to 1916-17, at approximately 130 trillion calories. Expressing the population in terms of equivalent adult men (by a rough procedure open to certain criticisms), he calculated that this was equivalent to 4,290 calories per day per adult man, or, after allowances for edible wastage, to about 3,424 calories.<sup>27</sup> Pearl's elaborate calculations have not been continued beyond 1916-17. A revision of them in the light of fuller knowledge, and their extension forward and backward, would be of great interest; but the closer one gets to the data the larger the problems of estimate and assumption appear. On the basis of the foregoing discussion it would seem probable that corresponding figures for 1921-1928 would show an appreciable reduction in per capita intake, though not necessarily a reduction in intake plus edible wastage, for the latter may have increased.

Pearl's calculations showed the percentage distribution of calories contributed by various classes of foods as given in Table 6, for the period 1911-12 to 1916-17. Of outstanding importance, on this basis, appear wheat and corn among the cereals, pork (including lard) and beef among the meats, dairy products, and sugars. These foodstuffs alone con-

TABLE 6.—PERCENTAGE OF TOTAL FOOD VALUE FURNISHED BY VARIOUS FOODSTUFFS, AVERAGE 1911-12 TO 1916-17, ACCORDING TO RAYMOND PEARL<sup>a</sup>  
(In terms of calories)

Commodity	Per cent	Commodity	Per cent
Wheat.....	25.90	Sugars.....	13.24
Corn.....	7.03	Potatoes.....	3.36
Rye.....	0.45	Legumes.....	0.83
Rice.....	0.60	Other vegetables.....	1.13
Other cereals.....	0.69	Total vegetables.....	5.32
Total cereals.....	34.67	Apples.....	1.08
Pork (and lard).....	15.74	Bananas.....	0.40
Beef.....	5.30	Oranges.....	0.11
Mutton and lamb.....	0.61	Other fruits.....	0.62
Fish.....	0.41	Total fruits.....	2.21
Dairy products.....	15.26	Nuts.....	0.92
Poultry and eggs.....	2.02	Cocoa.....	0.29
Oils.....	3.62	Total miscellaneous.....	1.21
Oleomargarin.....	0.42		
Total meats, fish, poultry and dairy products, and oils.....	43.38		

<sup>a</sup> *The Nation's Food*, 1920, p. 236. These figures make no allowance for edible wastage, which Pearl roughly estimated at 5 per cent for proteins, 25 per cent for fats, and 20 per cent for carbohydrates.

<sup>27</sup> *The Nation's Food*, Philadelphia and London, 1920, pp. 247-248. See also Chap. V, Marketing.

tributed nearly five-sixths of the total calories consumed. It is pertinent to inquire what changes, if any, have taken place in the content of the diet in the periods since the one which Pearl treated.

Certain tendencies are fairly clear. Consumption of cereals, notably wheat and corn, has declined, while consumption of dairy products, vegetable oils, sugar, and miscellaneous vegetables and fruits, has increased. Official estimates for meats and lard point to a decline up to about 1917, and a subsequent recovery to a higher level about 1924, such that the average for 1921-1927 would be above the average for 1911-1917; but the basic data on meats and lard are so untrustworthy that the case is not entirely clear.

*Cereals.*—Cereals furnish a large proportion of the carbohydrate in the diet and are among the cheapest foods in terms of calorie yield. Wheat, the most important single food of a large part of the civilized world, contains some protein and fat and limited amounts of several mineral salts and vitamins A, B, and E. The wheat germ and other parts of the berry which are largely removed in milling are especially rich in the best wheaten proteins, oil, minerals, and vitamin B, and contain a good deal of vitamin E. Hence common white flour, which is commercially preferred because of its keeping qualities and is best liked by consumers, contains much reduced amounts of protein (and those of poor quality), of vitamin A, B, and C, and of calcium, sodium, chlorin, iron, and phosphorus. As compared with whole wheat flour, therefore, it requires more supplementation from other foods to insure a complete diet. Rice, the most important cereal in the diet of half the human race, is broadly similar to wheat; but polished rice, the ordinary commercial product, has lost even more of the valuable elements of the entire kernel. Corn also is similar in character to wheat, though it contains more oil and its proteins are of poorer quality.

The per capita use of cereals in the United States—notably corn meal and wheat flour—has tended downward for many years. Corn meal is to-day the mainstay of the diet only among a limited and decreasing fraction of the population, and bread has become less and less the staff of life. Holbrook Working has made careful calculations as to the per capita consumption of these cereals from 1889 forward for each year in which a census of manufactures was taken. According to his figures, summarized in Table 7, the daily average consumption of these two major cereal foods fell from 1,537 calories in 1889 to 901 in 1919, a reduction of over 40 per cent in 30 years. The decline was fairly continuous, though not at a uniform rate. The reduction in consumption of corn meal was most pronounced between 1899 and 1904, when flour consumption was declining slowly. Throughout the 30-year period ended in 1919, shifts from corn meal to flour as a basic staple of the diet, among classes previously accustomed to use corn meal extensively,

tended partially to offset declines in flour consumption among other classes. The reduction in the two cereal foods combined was greatest in the five-year period 1914-1919, implying that under war conditions the secular trend was accelerated. From 1919 to 1923 the data indicate a slight recovery, rather than a continuance of the decline. This is probably to be interpreted as a temporary interruption of the downward trend, for the combined figure for 1925 was slightly lower than that of 1919. But it may well be that further declines, if and when the trend reappears, will be much more gradual than those which occurred between 1899 and 1909 or between 1914 and 1919. There are no present indications, however, that the cereals will regain the higher position which they formerly held in the American diet.

Several factors combine to account for the per capita decline in the use of cereals in the United States. Dietary studies of families in different income groups at a particular time almost invariably show that the higher the income, the lower the place of cereals (which are usually the cheapest foods) in the diet.<sup>28</sup> With a rising level of per capita incomes, the same tendency has been at work over a period of time. Moreover, the brunt of the decline in energy requirements has apparently been borne by the cereals, chiefly wheat flour and corn meal. They have suffered in competition with cheap sugar, another carbohydrate, and also with meats and other more expensive foods as the national diet has become increasingly diversified. This competition has been very real, though largely indirect and unnoticed. Even bread, as commercially baked in this country, now contains a smaller proportion of wheat

<sup>28</sup> Cf. the following percentages (slightly recalculated) shown by a study of 391 families by R. C. Chapin, *The Standard of Living among Workingmen's Families in New York City*, New York, 1909, p. 140:

Income group	Percentage spent for					
	Cereals	Meats and fish	Eggs, milk, etc.	Sugar, etc.	Vegetables and fruits	Alcohol
\$600- \$699.....	21.0	29.2	21.5	7.9	13.8	6.6
700- 799.....	19.9	31.4	19.8	8.3	13.9	6.7
800- 899.....	19.0	31.6	20.2	8.5	13.2	7.4
900- 999.....	17.6	30.7	23.3	8.0	14.4	6.1
1,000-1,099.....	17.3	32.1	21.2	8.0	14.2	7.2

In many countries with very low per capita incomes, the tendency with increased prosperity is toward increasing per capita use of wheat and rice, and decreasing use of corn, barley, millets, and pulses. Up to a certain point, rising standards of living involve continuous substitution of the more esteemed cereals for the less esteemed, and perhaps absolute increase in cereal consumption. After a certain point is reached, however, further advance in standards of living leads to decline in cereal consumption, as in this country in recent years.

flour and a much larger proportion of milk, fats, sugar, and other ingredients than was true a generation ago. It is exceedingly difficult to say what has been the net effect of such influences as war-time propaganda for economy in flour, general discontinuance of the practice of serving free portions of bread with meals in public eating places, criticism of white flour as deficient in important nutrients and roughage, extensive advertising of bread as the "best and cheapest food," and changing proportions of waste.

TABLE 7.—AVERAGE PER CAPITA CONSUMPTION OF CORN MEAL AND WHEAT FLOUR, CENSUS YEARS 1889 TO 1925, ACCORDING TO HOLBROOK WORKING<sup>a</sup>

Year	Barrels of 196 pounds per annum		Equivalent in calories per day		
	Corn meal	Wheat flour	Corn meal	Wheat flour	Both products
1889.....	0.597	1.142	531	1,006	1,537
1899.....	.527	1.148	468	1,011	1,479
1904.....	.390	1.133	346	995	1,341
1909.....	.295	1.077	262	948	1,210
1914.....	.210	1.036	187	912	1,099
1919.....	.129	.893	115	786	901
1921.....	.130	.896	116	789	905
1923.....	.139	.902	124	794	918
1925.....	.115	.902	102	794	896

<sup>a</sup> For corn meal, 1889-1923, from *Wheat Studies*, Food Research Institute, July, 1926, Vol. II, p. 279; for wheat flour, revised figures for per capita consumption in barrels as given in his later study in *ibid.*, December, 1927, Vol. IV, p. 86. Other figures computed by Working's method.

*Meat and Lard.*—Meats furnish the major portion of the proteins of the diet, in a readily assimilable form; and meats and animal fats furnish a considerable but declining proportion of the fats. The fats largely serve as fuel, in a form easily converted into energy. As sources of fat, animal products are often more expensive than vegetable oils at present, except in countries where animal products are extensively produced for export and where vegetable fats are not produced in considerable amounts. The proteins serve primarily for building and rebuilding body tissues, but surpluses are converted into energy, with somewhat less economy than in the case of fats and carbohydrates. As sources of protein, meats hold a preferred position so far as the proteins are needed for rebuilding of tissue, but as sources of energy they are usually much more expensive than fats or carbohydrates.

The demand for meat is quite elastic: when meat prices are relatively low or times are prosperous, consumption tends to be high; when prices rise or purchasing power diminishes, consumption declines. In hard times much greater economy is practiced in utilizing meats and especially their fats. The yield of grease from garbage is said to afford a fair index of the state of employment. Changes in relative prices of different cuts

TABLE 8.—PER CAPITA CONSUMPTION OF MEATS AND LARD, 1900-1927, ACCORDING TO ESTIMATES OF THE BUREAU OF ANIMAL INDUSTRY<sup>a</sup>

Calendar year	Beef	Veal	Lamb and mutton	Pork excluding lard	All meats <sup>b</sup>	Lard	Meats and lard
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
1900.....	67.8	3.5	6.8	64.7	142.8	13.2	156.0
1901.....	69.0	3.9	6.9	63.0	142.8	12.9	157.7
1902.....	68.5	4.4	7.0	57.8	137.7	11.7	149.4
1903.....	76.0	4.7	7.2	59.3	147.2	11.8	159.0
1904.....	73.6	5.1	6.8	62.8	148.3	12.4	160.7
1905.....	73.0	5.4	6.5	58.8	143.7	10.0	153.7
1906.....	72.6	5.4	6.5	59.7	144.2	11.2	155.4
1907.....	77.5	6.7	6.4	64.4	155.1	13.5	168.6
1908.....	71.5	6.4	6.3	66.1	150.3	13.5	163.8
1909.....	75.4	6.9	6.6	60.1	149.2	11.5	160.7
1910.....	71.1	6.8	6.4	57.1	141.6	11.4	153.0
1911.....	67.7	6.4	7.8	64.5	146.5	11.3	157.8
1912.....	61.1	6.3	8.1	61.8	137.4	11.2	148.6
1913.....	60.6	5.1	7.5	63.0	136.3	11.4	147.7
1914.....	58.4	4.6	7.4	62.3	132.9	12.2	145.1
1915.....	54.5	4.3	6.3	59.5	124.8	12.9	137.7
1916.....	56.0	5.3	6.1	60.1	127.7	13.6	141.3
1917.....	59.5	6.5	4.6	49.3	120.1	11.7	131.8
1918.....	63.0	7.4	4.7	54.8	130.1	13.3	143.4
1919.....	61.6	7.7	5.8	54.8	130.0	12.3	142.3
1920.....	63.1	7.6	5.5	60.5	136.8	13.3	150.1
1921.....	56.9	7.0	5.9	63.5	133.3	11.3	144.6
1922.....	60.4	7.3	5.0	66.1	138.8	14.2	153.0
1923.....	61.3	7.7	5.2	74.7	148.9	15.3	164.2
1924.....	61.5	8.2	5.2	74.7	149.6	15.4	165.0
1925.....	62.1	8.7	5.2	67.6	143.6	13.2	156.8
1926.....	63.4	8.2	5.5	65.7	142.8	13.5	156.3
1927.....	58.0	7.4	5.4	68.5	139.3	13.8	153.1

<sup>a</sup> U. S. Department of Agriculture, Bureau of Animal Industry, *Meat Production, Consumption, and Foreign Trade in United States, Calendar Years 1900-1927*, p. 9.

<sup>b</sup> Including very small quantities of goat meat in certain years.

also afford some indication of the purchasing power of the mass of consumers. On the whole, meats constitute one of the most flexible elements in the diet; not only the total quantity purchased, but the proportions of the different meats, the choice of cuts, and the degree of utilization, vary from time to time as prices and purchasing power change.

Consumption of meats tends to vary also with conditions of production and transportation. It is distinctly heaviest in pioneer countries where cattle and sheep are extensively raised for export, as in Argentina, New Zealand, and Australia. As new countries pass out of the frontier stage in which grazing is a leading industry, the cattle and sheep industries decline in relative importance, their meats tend to become relatively expensive, and per capita consumption of beef and veal, mutton

and lamb, tends to decline. This has been true in the United States. On the other hand, pork consumption is commonly light in new countries; and as agriculture becomes more intensive the proportion of pork in the diet tends to rise while other meats tend to decline.

In the United States the long-term changes in production conditions have tended, on the whole, to make for reduced per capita consumption of beef,<sup>29</sup> mutton, and lamb, and increased consumption of pork and lard, which we produce extensively for export. According to official estimates, which are by no means trustworthy,<sup>30</sup> this is what has actually occurred since the war as compared with a period before the war, as shown by Table 8. But there has apparently been a substantial recovery in beef and veal consumption from a low point in 1917, to a level not far below the prewar, and with a still greater increase in pork consumption, the total meat consumption per capita has ranged above rather than below prewar levels. So far as one may trust these figures, it would appear that increased purchasing power of classes who formerly ate little meat has more than offset tendencies to reduced consumption on the part of other classes. It does not follow, however, that there is increased ingestion. The wastes are heavier in pork, which now represents a larger fraction of the total, than in other meats; wastes tend to be higher in all meats when they are more freely purchased; and more of the less prized portion of the animal tends to go to inedible uses to-day than before the war. It is not improbable that ingestion of meats and animal fats has declined in recent years while "consumption" in terms of pounds has increased.

*Poultry and Eggs.*—Consumption of poultry, to judge by the imperfect index of receipts at great urban markets, increased substantially between 1920 and 1924, as shown in the following figures in millions of pounds:<sup>31</sup>

Year	New York	Chicago	Boston	Philadelphia	Four markets
1920.....	101.1	57.3	34.1	21.6	214.1
1921.....	124.6	65.0	39.9	22.9	252.4
1922.....	138.2	73.7	44.6	21.3	277.8
1923.....	163.9	90.3	56.0	24.6	334.8
1924.....	179.3	88.5	61.3	27.6	356.7
1925.....	170.3	72.1	46.7	29.3	318.4
1926.....	192.9	77.6	53.2	32.1	355.8
1927.....	188.1	63.7	53.3	31.8	337.0
1928.....	.....	.....	.....	.....	349.0

<sup>29</sup> A counteracting factor in the past fifteen or twenty years has been the tendency to market younger and lighter beef cattle.

<sup>30</sup> A recent criticism of the estimates is expressed in a forthcoming work by L. B. Zapoleon on *Inedible Fats in the United States* (Fats and Oils Studies of the Food Research Institute, No. 3).

<sup>31</sup> *Yearbook of Agriculture*, 1927, p. 1093.



The increase in the first half of the period 1920-1928 doubtless reflects first the recovery from war-time restriction and subsequently the passing of the depression, as well as growth of urban population. Since 1923 there has been no sustained advance, in spite of continued growth in urban population. Average prices received by producers of chickens show a more substantial advance from prewar years than has been secured for most farm products.<sup>32</sup> This fact lends support to an inference of increased per capita demand for and consumption of poultry, at least up to 1923.

Receipts of eggs at the four markets named above, and San Francisco, show a marked increase from a low point in 1920 to a high point in 1923 but rather lower levels since then.<sup>33</sup> If 1920 and 1923 are ignored, the upward trend appears to be slight, and no greater than the increase of population in the territory served. Prices of eggs to producers have risen rather less than prices of farm products in general, and much less than prices of poultry; and prices of fresh firsts in New York and Chicago have risen less than prices of foods in general.<sup>34</sup> This lends support to the view that demand for eggs has not kept pace with growth of population; but there may have been offsetting increases in smaller towns which can be supplied from farming regions near by. Certainly the farmers' wives have been under stress in recent years to make the most of the income they derive from their poultry. Exports of eggs in the shell have increased greatly since before the war, but imports of eggs not in the shell (mainly from China) have risen much more.<sup>35</sup>

*Dairy Products.*—From a nutritive standpoint, milk is the most satisfactory single article of food consumed by man. Though not a complete food, it is the ideal food for compensating for deficiencies in other foodstuffs and is the one food for which there is no effective substitute. Along with 87 per cent water, it contains mainly proteins and fats of high quality, and milk sugar. It is unique in its calcium content, in good balance with phosphorus, but is poor in iron. Milk fats are the most important sources of vitamin A, and milk also contains vitamins B and C. Pasteurization largely eliminates vitamin C and may adversely influence the availability of its inorganic content, but does not otherwise affect its good qualities.<sup>36</sup>

The human consumption of dairy products in the United States has tended upward since the war, at least from 1920. Earlier data are unsatisfactory, and even the official estimates now available are by no

<sup>32</sup> *Ibid.*, p. 1097.

<sup>33</sup> *Ibid.*, pp. 1098-1099.

<sup>34</sup> *Ibid.*, p. 1105.

<sup>35</sup> *Ibid.*, pp. 1103-1104.

<sup>36</sup> Based on E. V. McCollum and Nina Simmonds, *The Newer Knowledge of Nutrition*, third edition, New York, 1927, pp. 152-156.

means highly dependable, but all the evidence supports the stated inference. Production of milk has increased, not because of increased herds of dairy cows<sup>37</sup> but because, with improved breeds, selection, and feeding, yields per cow have risen. According to the official estimates as shown by Table 9, milk production increased from about 90 billion pounds in 1919 to over 120 billion pounds in 1926; thus production increased about one-third while the population increased about 11 per cent. The amount fed to calves has remained fairly constant, tending to constitute a declining fraction of 4 per cent or less, while waste, loss, and unspecified uses are estimated at around 3 per cent. The official estimates indicate an increase of nearly 50 per cent in the total consumption of fresh milk, and of nearly one-third in the per capita consumption of fresh milk,

TABLE 9.—PRODUCTION OF MILK AND MILK PRODUCTS, 1919-1926, ACCORDING TO OFFICIAL DATA AND ESTIMATES<sup>a</sup>  
(Millions of pounds)

Year	Estimated production	Manu- factured	Used for household purposes	Fed to calves	Waste, loss, etc.
1919.....	90,058	45,352	38,619	3,500	2,587
1920.....	89,657	43,652	39,090	4,202	2,713
1921.....	98,862	46,493	45,143	4,260	2,966
1922.....	102,562	48,478	46,673	4,335	3,077
1923.....	109,736	51,830	50,440	4,174	3,292
1924.....	114,666	53,811	52,772	4,642	3,440
1925.....	116,505	54,637	54,326	4,047	3,495
1926.....	120,766	56,785	56,417	3,942	3,623

Year	Principal manufactured products				Whole milk used in other manu- factured products
	Butter	Cheese	Condensed and evaporated milk	Ice cream <sup>b</sup>	
1919.....	1,560	420	1,925	230	128
1920.....	1,539	362	1,578	260	198
1921.....	1,705	356	1,464	244	116
1922.....	1,778	375	1,431	264	177
1923.....	1,862	399	1,775	295	242
1924.....	1,956	418	1,700	286	277
1925.....	1,951	447	1,758	322	348
1926.....	2,067	427	1,734	325	311

<sup>a</sup> Data from *Yearbook of Agriculture*, 1927, p. 1067, and similar tables in earlier issues.

<sup>b</sup> Million gallons.

<sup>c</sup> Amount used in "chocolate" not given. In later years it is the largest item.

<sup>37</sup> The statistics, such as they are, appear in the *Yearbook of Agriculture*, 1927, p. 1061. They suggest no material increase in the number of dairy cows between 1920 and 1928, and indeed a decline in 1925 and 1926.

between 1919 and 1926. There has been a general improvement in standards of quality, particularly as respects purity and cleanliness, and probably also in respect to fat content. Such an increase in milk consumption implies material improvement in the diet of children and of the poorer classes generally, and, especially in connection with improvements in quality, a higher degree of safeguarding of health besides.

The increase in consumption of milk products has apparently been less marked than the increase in consumption of fresh whole milk. According to the official estimates, the percentage of total output consumed as such for household purposes rose from 42.9 per cent in 1919 to 46.7 per cent in 1926; while the percentage manufactured declined from 50.4 per cent to around 47 per cent. Nevertheless the quantity manufactured has risen rather steadily in per capita amounts as well as in total. Per capita figures for consumption of butter, ice cream, condensed and evaporated milk, and cheese, given in Table 10, show fairly continuous upward trends since 1919. The increase between 1919 and 1926 was about 23 per cent in the case of butter, 27 per cent in cheese, 32 per cent in condensed and evaporated milk, and over 45 per cent in ice cream.

TABLE 10.—APPARENT PER CAPITA CONSUMPTION OF PRINCIPAL MANUFACTURED DAIRY PRODUCTS AND OLEOMARGARIN, 1919-1927<sup>a</sup>

Calendar year	Condensed and evaporated milk (pounds per annum)	Cheese (pounds per annum)	Ice cream (gallons per annum)	Butter (pounds per annum)	Total four products	Oleomargarin (pounds per annum)
1919.....	10.88	3.43	2.11	14.50	.....	3.32
1920.....	10.10	3.53	2.32	14.60	.....	3.38
1921.....	11.37	3.51	2.25	15.92	.....	1.94
1922.....	12.46	3.72	2.39	16.37	.....	1.64
1923.....	13.13	3.85	2.74	16.75	.....	2.03
1924.....	13.82	4.12	2.67	17.42	.....	2.03
1925.....	13.75	4.24	3.11	17.35	.....	2.02
1926.....	14.34	4.37	3.07	17.87	.....	2.08
1927.....	14.54	4.11	.....	16.84	.....	2.32
Calories per day						
1919.....	24.2	18.3	25.8	143.2	211.5	32.1
1920.....	22.4	18.8	28.7	143.8	213.7	32.6
1921.....	25.3	18.8	28.4	157.2	229.7	18.7
1922.....	27.7	19.9	29.3	161.7	238.6	15.8
1923.....	29.2	20.6	33.6	165.4	248.8	19.6
1924.....	30.7	22.0	32.6	171.6	256.9	19.6
1925.....	30.6	22.7	38.1	171.4	262.8	19.7
1926.....	31.9	23.3	37.6	176.5	269.3	20.1
1927.....	32.4	22.0	.....	166.3	.....	22.4

<sup>a</sup> Based upon Working's calculations in *Wheat Studies*, Food Research Institute, July, 1926, Vol. II, p. 277, with certain revisions and additional figures.

In terms of calories per capita (which is by no means an effective measure in the case of milk), these four milk products showed an increase of over 27 per cent, from 212 to 270 calories per day.

The increased consumption of dairy products is the result of several factors. Higher purchasing power of consumers is undoubtedly one. Greater assurance of safety in the use of whole milk, as a result of public inspections and improved private practices, is another which has had cumulative effects. Wider appreciation of the special virtues of these foods, as a result of medical advice, the work of school and district nurses, the circulation of literature on child feeding, home economics teaching, and commercial advertising, has probably been a major factor. The closing of the saloons has had a double influence through setting free income formerly spent for liquor, and through promoting the spread of places where milk beverages and ice cream are served. The expansion of commercial production of ice cream has made this product more readily available. However it may be accounted for, the increased consumption of dairy products reflects improvement in food standards.

*Vegetable Oils.*—These products are ordinarily cheap sources of fat, but (like lard) lack vitamin A which is found in butter fat and liquid portions of beef fat. One of the most striking changes in the American diet of the past half century, and especially since the war, has been the

TABLE 11.—PROPORTION OF ANIMAL AND VEGETABLE FATS USED IN AMERICAN OLEOMARGARIN MANUFACTURE, 1912 TO 1927-28<sup>a</sup>  
(Per cent of total fats)

Year	Of animal origin				Of vegetable origin			
	Oleo oil	Neutral lard	Other <sup>b</sup>	Total	Cotton-seed oil	Coconut oil	Other	Total
1912.....	42.3	22.2	3.2	67.7	26.8	0.4	5.1	32.3
1914.....	48.7	20.4	4.3	73.4	22.2	0.1	4.3	26.6
1916.....	41.5	20.1	3.3	64.9	30.1	0.3	4.7	35.1
1917.....	38.5	16.9	4.2	59.6	25.3	7.9	7.2	40.4
1918.....	33.6	15.9	6.6	56.1	12.7	21.6	9.6	43.9
1919.....	31.8	14.9	5.6	52.3	12.3	22.7	12.7	47.7
1919-20.....	28.6	12.2	5.7	46.5	12.5	25.6	15.4	53.5
1920-21.....	21.0	12.4	4.9	38.3	7.8	43.6	10.3	61.7
1921-22.....	24.7	16.2	8.1	49.0	9.3	34.6	7.1	51.0
1922-23.....	25.7	16.2	6.2	48.1	10.3	36.2	5.4	51.9
1923-24.....	25.2	15.5	6.1	46.8	10.0	40.1	3.1	53.2
1924-25.....	23.5	13.7	6.6	43.8	11.2	42.3	2.7	56.2
1925-26.....	21.9	11.6	6.3	39.8	11.8	45.3	3.1	60.2
1926-27.....	21.8	11.1	5.7	38.6	10.5	48.2	2.7	61.4
1927-28.....	17.8	9.8	5.0	32.6	9.7	55.1	2.6	67.4

<sup>a</sup> Data for 1912-1924 from United States Tariff Commission, *Certain Vegetable Oils*, Part 2, pp. 168-169; for 1925-26 and later years from Annual Reports of the Commissioner of Internal Revenue.

<sup>b</sup> Butterfat content of milk consumed calculated on basis of 3.8 per cent butterfat in milk.

increasing use of vegetable oils, either in place of animal fats or as supplements to them. The change can be observed even in the composition of oleomargarin, a product containing both animal and vegetable fats, as shown by Table 11. Prior to the war, vegetable oils usually furnished less than one-third of the total fatty ingredients; with the increasing use of coconut oil, which is solid at ordinary temperatures, the proportion of vegetable oils has risen until recently they have constituted over 60 per cent.

The consumption of margarin has never been so high in the United States as in several countries of Europe, where, as shown by Table 12,

TABLE 12.—ESTIMATED PER CAPITA CONSUMPTION, IN POUNDS, OF OLEOMARGARIN IN VARIOUS COUNTRIES, 1913, 1924, 1926<sup>a</sup>

Country	1913	1924	1926
Denmark.....	33.0	45.6	49.5
Norway.....	24.0	35.3	38.5
Netherlands.....	4.4	15.7	18.7
Germany.....	7.9	12.3	14.3
Sweden.....	9.9	12.3	13.2
United Kingdom.....	7.8	11.8	13.2
Belgium.....	3.3	7.4	10.0
France.....	0.9	1.5	2.2
United States.....	1.5	2.1	2.1

<sup>a</sup> *Foreign Crops and Markets*, May 14, 1928, Vol. XVI, p. 704, citing various sources.

it has been highest in a few small countries which are large producers of dairy products. Since the war, in spite of the recovery in production of animal fats and dairy products, the consumption of margarin has tended upward, largely because of technical improvements making for higher palatability, perhaps also because of truer knowledge of its food value.

In the United States, legislation has been restrictive, and there is some popular prejudice against margarin. The consumption rose to unusually high levels during the war and immediately after, when butter prices were relatively high. From a peak in 1920, as shown by Table 10, per capita consumption of margarin sharply declined to a level in 1922 less than half the 1920 figure, while butter consumption increased by about the same amount. The increase in per capita consumption of butter represented in part a recovery from a temporary decrease in consumption during 1917, 1918, and 1919. Since 1922 butter and margarin consumption have both tended upward, though preliminary figures for 1927 show a decline in butter greater than the increase in oleomargarin. Taking the two products together, the net increase in terms of calories per capita was only about 12 per cent between 1919 and 1926.

Another important factor in the displacement of animal fat by vegetable oil is the increased use of vegetable oils as shortenings and cooking

fats. This began in the eighteen eighties with the adulteration of lard with cottonseed oil. Later lard substitutes were manufactured from oleostearin and cottonseed oil. About 1910, with the development of the process of hydrogenating oils, solid cooking-fats were produced from cottonseed and similar oils alone. These now represent one of the most important types of fats for cooking and shortening purposes. The volume consumed is of the same order of magnitude as the quantity of lard exported; indeed, if it were not for this extensive use of vegetable oils, but a small lard export would be possible in some years. Consequently, cottonseed oil has been extensively diverted from industrial to dietary uses.

Finally, with the increase in consumption of fresh fruits and vegetables in the form of salads throughout the year, goes an increased use of salad oil. This is in part olive oil, but also, in large part, carefully refined, deodorized and decolorized cottonseed oil. Salad oil may be consumed as such, but a large part of the consumption is in the form of prepared mayonnaise and other dressings, and their manufacture has become a considerable industry.

Altogether, the increased use of vegetable oils has contributed to diversification of the diet, to convenience in the kitchen, and to some actual and more potential cheapening of the food fats as a whole. It has come about largely as a result of improved technology, supplemented by vast commercial advertising. Provided the nutritive deficiencies of vegetable oils are made up by other components in the diet, as is ordinarily the case, there are no offsetting dietary disadvantages.

*Sugar.*—Consumption of sugar in the United States has tended upward for many years, and has risen to a notable degree in the years since the war. Cane sugar and beet sugar, the principal classes, are almost pure carbohydrate, in a form readily shipped, sold, stored, used, and assimilated. Sugar is prized not merely for its food value, but for the appetizing taste that it lends to many foods and beverages. In ordinary years it is a cheap food. It is economical also in the sense that little is wasted. Statistics of sugar production are fairly reliable. Statistics of stocks are poor, and stocks may vary so greatly that production data for a single year afford no satisfactory index of consumption. In averages over a period of years, however, variations in stocks may be disregarded.

As shown by Table 13, apparent per capita consumption of beet sugar and cane sugar (disregarding stocks) rose sharply in the last century from the late eighties to the middle nineties, again in the early years of the new century, and then climbed slowly to a record level of nearly 90 pounds (in terms of raw sugar) in the two or three years before the war. With higher prices, it declined during the war years to around 80 pounds in 1915-16 to 1917-18. The subsequent movement has been strikingly upward. Per capita averages for two successive fiscal years have risen as follows:

79 lbs. in 1909-1911, 88 lbs. in 1912-1914, 80 lbs. in 1916-1918, 100 lbs. in 1920-1922, and 113 lbs. in 1925-1927. But by no means the whole of this increase has occurred in clearly visible forms. More and more sugar is consumed in bread, cake, ice cream, confectionery, and other commercial foodstuffs.

TABLE 13.—APPARENT PER CAPITA CONSUMPTION OF CANE AND BEET SUGAR IN THE UNITED STATES, IN TERMS OF RAW SUGAR, 1888-89 TO 1927-28<sup>a</sup>

Year, July-June	Pounds per annum	Calories per day	Year, July-June	Pounds per annum	Calories per day
1888-89.....	50.96	242	1908-09.....	82.18	390
1889-90.....	51.37	244	1909-10.....	79.72	378
1890-91.....	61.01	289	1910-11.....	78.14	370
1891-92.....	60.81	287	1911-12.....	83.85	396
1892-93.....	64.88	307	1912-13.....	86.34	409
1893-94.....	73.73	350	1913-14.....	90.41	428
1894-95.....	63.32	300	1914-15.....	86.95	412
1895-96.....	64.65	305	1915-16.....	78.66	372
1896-97.....	79.00	375	1916-17.....	82.25	390
1897-98.....	48.07	228	1917-18.....	77.75	368
1898-99.....	62.60	297	1918-19.....	83.64	396
1899-1900.....	59.69	283	1919-20.....	91.14	431
1900-01.....	72.86	345	1920-21.....	97.62	463
1901-02.....	64.32	305	1921-22.....	102.43	486
1902-03.....	80.10	380	1922-23.....	106.61	505
1903-04.....	70.15	332	1923-24.....	100.21	474
1904-05.....	73.35	348	1924-25.....	114.43	542
1905-06.....	77.20	366	1925-26.....	114.67	543
1906-07.....	82.77	392	1926-27.....	111.17	527
1907-08.....	75.54	357	1927-28.....	110.16	522

<sup>a</sup> Figures for 1888-89 to 1907-08, in pounds per capita, as calculated by Working, in *Wheat Studies*, July, 1926, Vol. II, p. 278. Latest figures computed by Working's method from data in *Yearbook of Agriculture*, 1927, p. 959, which differ from the earlier by allowing for domestic exports in forms other than sugar.

Higher levels of incomes account in part for increases in per capita consumption of sugar.<sup>38</sup> Another factor in the postwar increase has been the relatively low prices of sugar since 1920, in consequence of the revival of beet sugar production in Europe, following a great expansion in cane sugar production in Cuba, Java, Hawaii, and elsewhere during the war. These conditions have made it possible for consumers to indulge their tastes for sugar at relatively small cost. Prohibition may have been a contributing factor, as in the case of milk. The increasing use of fruits also has tended to a concomitant increase in the use of sugars.

At present levels of consumption, cane and beet sugar appear to furnish over 500 calories per capita per day to the diet, as compared with about 400 in the last prewar years. Such an increase in sugar intake is

<sup>38</sup> There are strong indications that sugar consumption tends to increase materially in times of prosperity and to decline or increase but slightly in times of depression.

the more striking in the face of declining physiological needs for food, especially of energy-yielding foods, and it is undoubtedly related to the decline in consumption of cereals. The result has been an increase in the palatability of the diet, with increased economy of effort, less waste of foodstuffs, and no demonstrably deleterious effects upon health.

*Fruits and Vegetables.*—Most vegetables and fruits, including nuts, contain more or less carbohydrate, and some, such as white and sweet potatoes, bananas, and chestnuts, are especially rich in it. Most of the common food nuts, except chestnuts, are rich in fat. These and the pulses (such as peas, dried beans, and soy beans) are rich in proteins, but with certain exceptions these proteins are of inferior quality. Other vegetables and nuts contain more or less protein. In respect to their contribution to the diet, there are great differences among the several fruits and vegetables, and even among varieties, individual specimens, and parts of the whole. As a class, their nutritive importance lies less in the factors mentioned above than in others more recently analyzed. Most fruits and vegetables are important sources of vitamins A, B, and C. Certain vegetables, especially the leafy ones, are important for their content of mineral salts and their contribution of bulk roughage. Fruits are valuable for their mild laxative qualities and their tendency to maintain the normal alkali reserve in the blood which tends to be disturbed by an undue proportion of cereals, most other food seeds, and meats. Hence these products are valuable supplementary foods despite their respective deficiencies.

The acreage of 19 commercial truck crops, including early potatoes, leading fresh vegetables, and cantaloupes, watermelons, and strawberries, has increased since 1919 as shown in the following statement, in thousands of acres:<sup>39</sup>

1919.....	1,586	1924.....	2,373
1920.....	1,697	1925.....	2,548
1921.....	1,436	1926.....	2,461
1922.....	1,943	1927.....	2,435
1923.....	2,014	1928.....	2,711

These figures show a distinct upward trend.

From year to year variations in weather conditions cause a considerable variation in crops of fruits and vegetables; as it happens, 1921 was a poor year for most of these crops. Exports and imports are relatively small; even exports of apples average only about 11 per cent of the commercial crop. Except for imports of tropical products such as bananas, pineapples, coconuts, and a few others, the tendency has been, under substantial tariff duties and with expansion of domestic production and

<sup>39</sup> *Yearbook of Agriculture*, 1925, p. 941, and 1927, p. 903, and *Crops and Markets*, December, 1928, p. 461; according to the Division of Crop and Livestock Estimates. Data for carrots are lacking until 1923, when the figure was 9.77 thousand acres.



foreign demand, toward lower imports and larger exports of fruits and vegetables as a group. In recent years domestic exports of fruits and nuts, in the aggregate, have exceeded imports.<sup>40</sup> At certain seasons of the year, tomatoes, onions, and other vegetables are imported. In the main, however, shipments and consumption tend to vary with the domestic crop. The trends of crops and shipments, therefore, are the most readily available indicators of consumption.<sup>41</sup> Tables 14 and 15 summarize some of the significant available data for domestic products, and Table 16 shows the growth in imports of bananas.

From these indicators certain reasonable inferences can be drawn regarding per capita consumption since the war. That of certain staple fruits and vegetables—apples, white and sweet potatoes, cabbage, and onions—has risen comparatively little or not at all. That of most other fruits and a number of vegetables has risen substantially. That of celery, spinach, lettuce, carrots, and snap beans has risen a great deal. The increase has been greater in fresh products than in dried or canned products. Comparisons with prewar years are rendered difficult by lack of comparable data, but there is reason to believe that the trends mentioned have been accentuated during the present decade. One of the most striking increases is shown by lettuce, of which car-load shipments increased steadily from 13,788 in 1920 to 51,446 in 1928, to a rank (among the vegetables) in the latter year second only to white potatoes. Shipments of spinach showed an equally great relative increase, from 2,891 carloads in 1920 to 10,573 in 1927, while the relative increase was still greater in carrots and snap beans.

<sup>40</sup> This is shown, for fruits and nuts, by the following official data, in thousands of dollars:

Annual average	Domestic exports	Imports	Excess of imports (*) or exports (†)	Year	Domestic exports	Imports	Excess of imports (*) or exports (†)
1886-1890.....	3,724	19,584	*15,860	1920.....	84,390	101,551	*17,151
1891-1895.....	4,075	21,322	*17,247	1921.....	70,157	73,532	*3,375
1896-1900.....	8,394	17,661	*9,267	1922.....	75,864	72,499	†3,365
1901-1905.....	14,778	23,034	*8,256	1923.....	68,619	70,463	*1,844
1906-1910.....	16,531	33,692	*17,161	1924.....	97,689	72,336	†25,354
1911-1915.....	31,865	43,033	*11,168	1925.....	102,015	88,664	†13,351
1915-1920.....	61,501	61,755	*254	1926.....	111,797	87,337	†24,460
1921-1925.....	82,869	75,499	†7,370	1927.....	121,665	84,721	†36,944
1926-1928.....	120,930	87,184	†33,746	1928.....	129,329	89,494	†39,835

Data for 1886-1925 from *Statistical Abstract of the United States*, 1925, pp. 462, 464; later data from *Monthly Summary of Foreign Commerce*, December, 1927 and 1928.

<sup>41</sup> Unloads of 13 commodities at 11 principal markets tell much the same story, but are less complete for the earlier years. Cf. *Yearbook of Agriculture*, 1927, pp. 904-905.

Car-lot shipments do not, of course, reflect the situation accurately. On the one hand, increasing specialization in production and increasing concentration of population in cities have made for shipments in larger lots; on the other, there has been a considerable growth of shipments by automobile truck, especially of fresh vegetables, and of sale in roadside markets, especially of fruits. The chances are that, by and large, the shipment figures understate rather than overstate the actual growth of the trade. All the evidence supports the conclusion that, particularly in the cities and towns but even in rural areas, there has been a notable increase in the consumption of a great variety of fruits and vegetables, especially in the fresh state.

The great stress that has been laid on the several virtues of fruits and vegetables, especially those heretofore less commonly used, has undoubtedly exerted great influence on this growth. To this, education, the nutrition experts, the medical and nursing professions, home economics teachings, food faddists, restaurants, and commercial advertisers,

TABLE 14.—CAR-LOT SHIPMENTS OF LEADING FRESH FRUITS IN SEASON FOLLOWING HARVEST, 1920-1928<sup>a</sup>

Harvest year	Apples, June-June	Peaches, May-Nov.	Pears, June-May	Watermelons, Apr.-Jan.	Cantaloupes, Apr.-Dec.	Strawberries, Jan.-Dec.
1920.....	116,117	28,179	15,941	37,314	22,953	7,199
1921.....	89,560	27,334	13,053	45,749	25,815	10,865
1922.....	113,959	38,405	20,381	47,625	29,930	18,761
1923.....	138,184	33,525	18,589	33,029	25,923	17,801
1924.....	103,844	39,395	16,246	45,745	31,496	18,966
1925.....	127,909	40,845	21,257	44,184	33,819	12,256
1926.....	133,848	58,465	25,209	55,126	33,424	13,528
1927.....	93,094 <sup>b</sup>	41,714	18,744 <sup>b</sup>	45,460	36,757	17,893
1928 <sup>b</sup> .....	.....	56,596	.....	48,347	38,600	18,788

Harvest year	Oranges, Sept.-Aug. <sup>c</sup>	Grapefruit, Sept.-Aug.	Lemons, Nov.-Oct.	Mixed citrus, Sept.-Aug. <sup>c</sup>	All citrus fruits	Grapes, June-Dec.
1920.....	67,839	11,614	11,836	.....	.....	41,310
1921.....	44,317	13,516	9,907	.....	.....	37,817
1922.....	71,908	17,627	8,947	3,685	102,167	59,918
1923.....	79,036	20,337	13,391	5,070	117,834	65,336
1924.....	59,582	21,216	11,683	5,402	97,883	69,993
1925.....	67,091	15,331	13,982	5,171	101,575	81,878
1926.....	76,313	18,858	13,496	6,984	115,651	78,590
1927.....	60,634 <sup>b</sup>	16,160 <sup>b</sup>	12,680 <sup>b</sup>	7,941 <sup>b</sup>	97,415 <sup>b</sup>	82,572
1928 <sup>b</sup> .....	.....	.....	.....	.....	.....	79,825

<sup>a</sup> Data from *Yearbook of Agriculture*, 1927, and earlier issues, as "compiled from daily and monthly reports received by the bureau (of Agricultural Economics) from officials and local agents of common carriers throughout the country. Shipments . . . include those by boat reduced to car-lot basis." Preliminary data furnished by United States Department of Agriculture in advance of publication.

<sup>b</sup> Preliminary estimate.

<sup>c</sup> For California, November-October.

TABLE 15.—CAR-LOT SHIPMENTS OF PRINCIPAL VEGETABLE CROPS, SEASONS FOLLOWING HARVESTS OF 1920-1928<sup>a</sup>

Harvest year	Potatoes, Jan.-Dec.	Sweet potatoes, July-June	Cabbage, Dec.-Apr. (17 mos.)	Onions, Mar.-June (16 mos.)	Tomatoes, Jan.-Dec.	Celery, Dec.-June (19 mos.)	Dry beans, Jan.-Dec.
1920.....	185,176	17,206	34,826	29,473	18,394	10,859	8,981
1921.....	218,001	19,383	31,432	20,890	17,415	11,706	12,955
1922.....	245,407	21,566	41,347	30,478	26,717	14,920	11,761
1923.....	241,554	14,530	36,990	28,762	23,964	17,160	12,990
1924.....	252,095	16,067	41,951	30,796	26,830	18,429	15,903
1925.....	241,523	20,859	39,052	31,646	28,254	21,913	17,540
1926.....	232,422	25,738 <sup>b</sup>	40,515	33,063	26,071	21,000	17,683
1927.....	253,445	.....	39,067 <sup>b</sup>	35,191 <sup>b</sup>	32,664	24,471 <sup>b</sup>	17,154
1928 <sup>b</sup> .....	254,553	.....	.....	.....	30,336	.....	14,435

Harvest year	Lettuce, Jan.-Dec.	Spinach, Oct.-Dec. (15 mos.)	Cucum- bers, Jan.-Dec.	Snap beans, Jan.-Dec.	Cauli- flower, July-June	Carrots, Jan.-June (18 mos.)	Asparagus, Mar.-July
1920.....	13,788	2,891	3,689	1,473	3,853	1,602	1,226
1921.....	18,738	4,747	4,832	1,600	4,363	1,839	902
1922.....	22,240	4,914	6,349	2,631	4,608	2,256	767
1923.....	29,485	7,580	5,700	3,328	4,303	1,956	785
1924.....	30,935	7,507	7,182	4,618	4,454	3,299	1,235
1925.....	37,306	7,919	8,492	5,224	6,728	3,443	1,906
1926.....	42,105	9,383	7,272	4,854	6,892	4,303	2,419
1927.....	46,850	9,655	8,180	7,301	9,046 <sup>b</sup>	6,852	2,132
1928 <sup>b</sup> .....	51,446	10,573	7,468	5,760	.....	6,911	2,878

<sup>a</sup> Sources as for Table 14. Figures refer only to 12 months from any state of shipment, but shipping seasons in different states overlap in certain cases.

<sup>b</sup> Preliminary estimate.

TABLE 16.—IMPORTS OF BANANAS FOR CONSUMPTION, 1900-1927<sup>a</sup>

Year July-June	Thou- sands of bunches	Thou- sands of dollars	Year July-June	Thou- sands of bunches	Thou- sands of dollars	Calendar year	Thou- sands of bunches	Thou- sands of dollars
1900-01.....	.....	6,552	1909-10.....	39,142	11,633	1919.....	36,993	15,935
1901-02.....	25,342	7,305	1910-11.....	44,734	14,375	1920.....	39,320	19,088
1902-03.....	29,711	8,535	1911-12.....	44,510	14,368	1921.....	43,366	19,385
1903-04.....	25,751	7,748	1912-13.....	42,262	14,484	1922.....	45,094	19,146
1904-05.....	38,094	9,883	1913-14.....	48,691	16,398	1923.....	43,956	19,739
1905-06.....	35,103	10,330	1914-15.....	41,085	13,513	1924.....	47,384	22,074
1906-07.....	37,437	11,883	1915-16.....	36,755	12,106	1925.....	55,483	29,693
1907-08.....	37,073	11,391	1916-17.....	34,642	12,719	1926.....	56,251	31,684
1908-09.....	36,905	11,012	1917-18.....	32,138	15,438	1927.....	61,009	34,269

<sup>a</sup> Compiled from *Foreign Commerce and Navigation of the United States*, for 1900-1926, and *Monthly Summary of Foreign Commerce*, for 1927 and 1928.

have all contributed. Higher purchasing power of the mass of the people, together with relatively low prices for such staples as cereals,

lard, and sugar, have given latitude for enlarging the scope of the diet. Prohibition has directly increased the demand for grapes and at times other fruits; indirectly it has promoted the increased use of fruits served as or with light refreshments. There has been a growing appreciation of the palatability, variety, attractiveness to the eye, and digestive pleasures afforded by fresh fruits and vegetables, especially with the need for a lighter diet than was formerly customary. There has been increasing satisfaction in the convenience afforded by the canned products.

There also has been increased specialization in production and improved transportation and marketing. Grading and inspection at points of shipment and receipt, better packing, careful control of temperature in transit, fast freight trains, delivery on schedule, allocation to markets in accordance with knowledge of local demand and supply—these have made it possible to ship over greater distances with less loss in transit and less risk in sale. Under these circumstances, producing areas have been developed from border to border and from coast to coast; and the consumption season for all fresh products has been notably lengthened, until for so tender a product as lettuce the season is the whole year. Along with this has gone a reduction in prices, not so much in the height of the local season as in the rest of it, for in the process the local producers have suffered in competition with distant growers.

The expansion in consumption of fresh fruits and vegetables, especially of the types formerly used less extensively, has made a significant contribution to the American diet, nutritionally and in auxiliary satisfactions. The increase in consumption of the dried and canned products, which are valued especially for their convenience, has also been considerable, though less marked because of the greater availability of the fresh products. The net effect has been to raise food standards in each important respect.

**Diversification and Quality of the Diet.**—By contrast with American diets of earlier periods and the diets of most other countries to-day, the present dietary in the United States is remarkably diversified. Staples play a smaller part, and even they are available in more varied forms. A larger variety of foods is used, and increasing quantities of former rarities. Especially notable has been the increased use of a great range of fresh fruits and vegetables. The consumption of salads, which introduce a large element of variety, has undergone a marked expansion. Foods formerly limited to the well-to-do have come more and more within the reach of the masses.

From a nutritional standpoint diversification of the diet represents a gain, primarily because, without sacrificing the provision for intake of proteins, it tends to insure and stabilize the intake of vitamins, mineral salts, alkaline elements, and roughage. There is no longer serious danger of shortage in these essentials of the diet, in any class of the population,

except as ignorance or carelessness may be the cause; and such choices of foods are available that the diet selected without thought on these matters is more likely, nowadays, to be adequate in these respects. Furthermore, the adaptation of the diet to different nutritional needs of different members of a family, at different seasons, and under different circumstances, has been rendered easier.

The direct tendency of the diversification of the diet is probably toward complicating the provision, serving, and care of food. More things are ordered or purchased from more places. More articles of different kinds are kept in pantry and storage shelves. More operations, utensils, and dishes are involved than with simpler diets. More leftovers are to be disposed of. An increase in household labor from these causes has partially offset the saving through heavier purchase of foods in smaller units and ready-to-serve or partially prepared, far better culinary equipment, and smaller, better planned kitchens.

The quality of commercial foods has tended to improve in consequence of public regulation and industrial developments. Almost every year witnesses an increase in the public control over the production and sale of foodstuffs, through regulations extending all the way from grower to final consumer. Inspection of dairies, public efforts to eradicate bovine tuberculosis and to eliminate typhoid germs, tests of milk for bacteria count and butter fat content, and enforced pasteurization, have raised the effective standards for fresh milk, especially as concerns its safety for human consumption and probably to some degree making for higher food value. Meat inspection, particularly by the Federal service and city inspectors, has limited the sale of products made in part from the materials that are disease-producing, decomposed, revolting, unclean, or otherwise unfit for food; though such control is by no means universally effective, and there are indications that uninspected local slaughter has increased. Measures to prevent the sale of fruits and vegetables containing poisonous residues from spraying or other treatment, and to insure the wholesomeness of canned foods, are increasingly applied by commercial enterprises on their own account or under public control. The level of sanitary conditions under which other foods, including bakery products, are processed and sold has risen, partly as a result of public inspection, partly in consequence of the larger scale of enterprise, and partly because of the desire to appeal to the consumer's desire for assurance on this score. To a considerable extent, indeed, such regulations and practices rest upon aesthetic rather than physiological foundations; but the net effect has been to improve, to a notable extent, the quality and reliability of foods of all kinds. The present diet, at least in urban centers of this country, may reasonably be accounted the best in the history of the country—physiologically, psychologically, and with respect to economy of the consumer's effort.

**The Food Cost of Living.**—In spite of reduced physiological requirements per capita, low producers' prices of many foodstuffs, and economies incident to larger-scale production, the cost of the present diet is relatively high. For this a number of factors are responsible.<sup>42</sup>

The changing content of the diet, as well as its mere diversification, has involved a substantial amount of replacement of low-priced staples, rich in calories, by relatively high-priced articles, poor in calories. Pound for pound, fruits and vegetables are somewhat more expensive than cereals; but calorie for calorie, they cost several times as much as cereals. On a calorie basis, poultry is usually dearer than butcher's meat, butter than lard or margarin. Increased consumption of dairy products, physiologically important though it is, has added materially to food costs, except in so far as milk has been substituted for meat. Sugar is the outstanding exception to this general tendency. Added expense is involved in effective recognition of the special nutritive virtues of milk, cheese, butter, eggs, fruits, and vegetables, as compared with cereals (as commonly used), sugar, dried beans, and cured fat meats.

The large and increased spread between producer's prices and retail prices, which has attracted wide comment, affects producer and consumer in varying degrees from year to year. This widening margin is caused not merely by avoidable wastes in distribution, which are heavy indeed, but by a number of other factors. Each year sees a decline in the contribution of home gardens and fruit trees to the family table, as the proportion of urban and apartment house dwellers increases, and as land becomes more expensive in towns and rural areas adjacent to cities. Increasing concentration of population in cities inevitably makes for heavier terminal costs, and necessitates drawing supplies from more distant sources. The increasing geographical specialization in production necessitates longer hauls and costly care in preservation of perishables. Public regulation and private practices that have brought about improvement in quality of foodstuffs have also entailed substantial increments of cost. It is probable that expensive competitive advertising, which has been resorted to both in order to break down inertia of consumers and to expand the market for less staple products of many kinds, and in order to check the decline in consumption of staples, such as bread and meat, is partly reflected in higher food costs. In the main, the increased intermediate costs have been especially pronounced in those articles in the diet of which the consumption has increased the most.<sup>43</sup>

<sup>42</sup> In addition to the factors discussed in the text, two others deserve passing notice. The tariff unquestionably has an influence in the case of a number of commodities, but to what extent it is exceedingly difficult to ascertain. Immigration restriction and other factors making for higher labor costs per unit of product also have some influence.

<sup>43</sup> These matters are discussed in various publications of The Port of New York Authority. Cf. especially *Some Facts about Margins and Costs in Marketing Fruits and*

Changes in household practice have made for higher food costs, in large part to economize effort in the household; how far this involves increases in final cost can not be calculated, since no accounting for the cost of the housewife's labor is possible. The modern construction of dwellings, especially with the trend toward multifamily houses, provides little storage space and favors the simplification of cuisine. The trend of household management is in the direction of smaller operations. More and more, foods are bought ready cooked or prepared for a particular meal, and leftovers are relegated to the garbage pail. Less and less is food prepared for use over several days or longer periods. The tendency is toward smaller and more numerous purchases; hence the abandonment of the two-pound loaf for the one-pound, the demand for smaller units of prepared or canned foods, and increased preference for cuts of younger, smaller, leaner animals.

Furthermore, it would appear that each year a larger proportion of the national food supply is consumed outside the home, in public eating places. This is in part the reflection of increased short-time mobility of the population, and increased distance between residence and place of work. To an increasing extent the family obtains on a commercial basis the services that would otherwise be contributed by the housewife on a noncommercial basis.

On the whole, the common American diet of to-day is expensive—probably as compared with simpler diets of earlier years, certainly as compared with a simpler adequate diet to-day. In terms of gold it is probably higher than in any other country. Even after allowance for changes in the purchasing power of the dollar, it is almost certainly higher than before the war, and has probably tended upward since 1921.<sup>44</sup>

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*Vegetables in the Port of New York District, New York, 1925.* Nevertheless, one observes that the Bureau of Labor Statistics index of food prices at retail has risen in the country at large as much as in New York City, and more than in San Francisco, though rather less than in Chicago and Detroit.

<sup>44</sup> These statements are not inconsistent with the showing of index numbers of the food cost of living, which seem to show that food costs have risen, since before the war, less than consumers' goods in general, and less, on the whole, than the general level of prices. These indexes are based on the cost of an unchanging combination of more or less staple foodstuffs. They do not reflect the cost of the food actually purchased. Even the foods covered by such indexes are purchased in changing quantities as prices and purchasing power change. This is true of meats especially, but of many other foods in less degree. Similarly, indexes of the cost of living contain several groups, each composed of a fixed combination, and the weights of the units and groups are held constant over considerable periods of years. The comments here made would apply in like manner to other factors in the standard of living. Adaptations of purchases to changes in relative prices limit the extent to which increases or decreases in the index are reflected in actual outlays. On the other hand, the expansion of expenditures with increased purchasing power, aided by low prices of certain staples such as bread, lard, and sugar, has come to a large extent in foods not represented in the indexes.

The diet of to-day is, however, more flexible with changes in prices of different foodstuffs and in the purchasing power of the consumer. Increase in price of most single food products now makes a smaller proportional difference in the aggregate cost. Shifts from one foodstuff to another more or less similar are easily made, partly because others are freely available, partly because shifts are customary and are therefore accepted rather than resented. Economy in expenditures can probably be effected with less irksomeness.

Large outlays for food do not necessarily imply that food expenditures absorb a large percentage of income, any more than high wage scales necessarily imply high labor costs. Indeed, the almost universal testimony from studies of expenditures of families in various income groups, in a given class and locality, is that the higher the income the lower is the proportion spent for food. The validity of this, the first of Engel's famous laws, is attested by numerous studies, regardless of the country or group investigated. The indications are that, as a whole, the American public spends for food a smaller percentage of its income than is the case in any other country. There seems to be no reason to doubt that, with increases in real wages, this percentage has been materially smaller in recent years than before the war. Whether it is now tending upward, or downward, it is impossible to judge. Variations from year to year, and from times of depression to times of prosperity, are sufficient to obscure the trend on the present high level. But we lack adequate and trustworthy data on family expenditures, especially for comparisons over a period of time.<sup>45</sup>

### III. MANUFACTURED GOODS<sup>46</sup>

To estimate the changes in the total consumption of manufactured goods from time to time is a statistical impossibility. The shift from domestic to factory production, which in the long run has unquestionably been great, cannot be measured. Separation of the total output of many commodities that are used partly in consumption and partly in the production of other goods is for many reasons often not feasible. Where the value of output of specific goods is known, the problem of discovering a suitable price index to convert value into physical units has not yet been solved. This is strikingly the case with many textile products, where

<sup>45</sup> The Bureau of Home Economics in the Department of Agriculture has recently secured a small appropriation for beginning a national survey of dietary habits. It is greatly to be desired that properly planned studies of family expenditures be carried on during the next few years in connection with investigations on distribution already under way.

<sup>46</sup> The material for this section was prepared by Woodlief Thomas, formerly of the Division of Research and Statistics of the Federal Reserve Board, and the census data were taken, in the main from E. E. Day and W. Thomas, *The Growth of Manufactures*, Census Monograph, No. IX.



both production and consumption would appear to run counter to the prevailing trend. Probably the only, and certainly the most useful, approach to the problem consists in judging the movements in consumption by inferences drawn from the statistics of manufacturing output.<sup>47</sup>

On the basis of this material, the recent trends in the consumption of manufactured goods seem to be reasonably clear. There is, first, the enormous increase in the use of the automobile and the products associated with it. Almost equally striking has been the growth in the consumption of a great variety of mechanical devices for household use. In general, the period has been characterized by the widespread substitution of machine for hand-made products bought by the ultimate consumer.<sup>48</sup> Simultaneously with the advance in the use of the automobile there has been a marked development in the purchase of many commodities that a decade ago would have been described as luxury goods, but which have since entered so universally into the average budget as no longer to be regarded as such.

Since little is known of the extent of the shifts in consumption that take place in the average home, no estimate can be ventured of the lesser or greater income required for the purchase of these new goods. While there may have been some relative reduction in the cost of food and clothing, the gains from this source are probably dissipated by the higher relative prices of other commodities. There is certainly no overwhelming evidence that the new goods are together cheaper than the items they have replaced. Likewise, little that is definitive can be done with dating the beginning of these discernable trends in consumption. While some clearly began in the prewar period, they assumed imposing magnitude, either during the war or since 1919. In the body of this discussion, comparisons for the purposes of dating are made usually between the course of events during the long period from 1899 to 1925 and the short period from 1919 to 1925.

An attempt to indicate in the large the total movements in the use of goods that are consumed and of those that enter further into the processes of production is contained in Table 17. As it has already been pointed out, the measurement of output in physical units is for many of the products of manufacturing industry impossible. Use was, therefore, made of the number of wage earners and of the amount of primary horse power installed, as barometers of the growth of specific industries. Both measures are for this purpose defective: the number of wage earners, because increased efficiency has resulted in increased output with a

<sup>47</sup> See Chap. VI, Labor, p. 449.

<sup>48</sup> See Mechanization, Chap. II, Industry, Part 2, p. 104, Part 1, p. 84; Chap. III, Construction, p. 234; Chap. IV, Transportation, Part 1, p. 262; Part 2, p. 312; Chap. V, Marketing, pp. 324, 328, 350; Chap. VI, Labor, p. 483; Chap. VII, Management, p. 511; Chap. VIII, Agriculture, p. 551.

TABLE 17.—GROWTH OF SELECTED INDUSTRIES, PER CENT OF INCREASE OR DECREASE  
(Decrease indicated by minus (-) sign)

Industry	1899-1925			1919-1925		
	Quantity of output	Wage earners	Horse power	Quantity of output	Wage earners	Horse power
All industries.....	175	80	256	29	- 7	22
<b>I. Producers' goods:</b>						
<b>A. Basic material and supplies—</b>						
Iron and steel.....	204	102	307	32	- 3	14
Nonferrous metals.....	322	89	462	32	- 9	22
Petroleum refining.....	1,140	435	990	108	11	65
Chemicals and acids.....	472	231	652	36	-24	43
Gas, manufactured.....	406	110	1,246	14	10	80
Coke.....	189	36	1,077	16	-21	82
Paints and varnishes.....	210	163	372	40	19	69
Cement.....	931	230	944	101	51	78
Glass.....	272	31	413	78	-10	31
Brick, pottery, and other clay products.....	130	33	128	68	34	31
Lumber.....	7	23	65	14	5	- 5
Boxes, wooden.....	.....	59	163	.....	-18	0
Paper and pulp.....	286	150	219	41	9	31
Boxes, paper.....	.....	107	724	76	3	39
<b>B. Machinery and equipment—</b>						
Foundries and machine shops.....	.....	77	462	.....	-17	37
Machine tools.....	.....	.....	.....	.....	-31	47
Textile machinery and parts.....	.....	.....	.....	.....	-12	48
Engines, steam, gas, and water.....	.....	.....	.....	.....	-34	18
Pumps, steam-and-power.....	.....	.....	.....	.....	12	74
Electrical machinery and appliances.....	.....	471	1,252	.....	13	35
Agricultural implements.....	.....	-38	63	.....	-47	-10
Steam fittings, heating apparatus, and gas and oil stoves.....	.....	415	1,600	.....	38	77
Plumbers supplies.....	.....	315	1,019	.....	145	185
Tools, n.e.s.....	.....	234	573	.....	-29	16
Hardware.....	.....	98	337	.....	23	47
Cash registers and calculating machines.....	.....	544	946	.....	-20	- 4
Typewriters and supplies.....	.....	245	586	.....	- 4	19
<b>II. Consumers' goods:</b>						
<b>A. Food, drink, and tobacco—</b>						
Slaughtering and meat packing...	74	76	420	6	-25	23
Flour milling.....	4	0	0	-12	-29	-24
Bread and bakery products.....	.....	169	913	.....	14	37
Food preparations, n.e.s.....	.....	252	1,183	.....	- 5	32
Butter, cheese, and condensed milk.....	287	123	128	32	-17	20
Canning and preserving, fruits and vegetables.....	524	92	463	55	17	14
Sugar.....	350	58	85	48	29	10
Confectionery and ice cream.....	.....	233	1,435	.....	-10	60
Chocolate and cocoa products.....	.....	443	2,016	.....	-22	74
Manufactured ice.....	836	266	824	44	-17	62
Mineral and soda waters.....	.....	124	683	.....	13	51
Malt liquors and cereal beverages.....	.....	-78	-46	.....	-75	-67
Cigars.....	32	0	145	- 8	-16	-14
Cigarettes.....	2,038	320	1,800	51	-14	12

TABLE 17.—(Continued)

Industry	1899-1925			1919-1925		
	Quantity of output	Wage earners	Horse power	Quantity of output	Wage earners	Horse power
<b>B. Clothing and clothing materials—</b>						
Cotton goods.....	76	52	184	18	3	22
Woolen and worsted goods.....	60	31	144	14	- 1	22
Silk goods.....	322	103	144	37	5	22
Knit goods.....	154	123	213	13	8	18
Dyeing and finishing textiles.....	....	138	266	....	27	58
Men's clothing.....	....	45	238	....	0	11
Shirts.....	....	37	96	....	27	- 7
Men's furnishings.....	....	120	580	....	4	- 6
Women's clothing.....	....	52	146	....	-23	-25
Millinery and lace goods.....	....	221	551	....	6	- 3
Leather tanning.....	5	2	152	-16	-27	2
Boots and shoes.....	48	46	194	- 2	- 2	20
<b>C. Other consumption goods—</b>						
Furniture.....	....	105	248	....	29	52
Carpets and rugs.....	- 5	19	139	38	48	68
Phonographs.....	530	789	4,132	-57	-61	14
Pianos.....	....	- 6	30	-10	-13	- 6
Photographic materials.....	....	328	1,434	....	-14	82
Toys and games.....	....	330	559	....	1	44
<b>III. Miscellaneous industries:</b>						
Automobiles.....	151,850	19,028	37,074	204	24	117
Rubber goods.....	....	424	1,197	59	- 8	57
Railroad cars.....	....	60	590	-27	- 4	46
Locomotives.....	....	....	....	-62	-52	18
Ship and boat building.....	-22	7	288	-93	-87	-45
Printing and publishing newspapers and periodicals.....	....	29	240	....	2	23
Printing and publishing: book and job.....	....	100	360	....	10	29

fewer number of employees, and horse power because the amount installed does not measure the amount of power actually used. Supplemented, however, by a variety of data regarding particular commodities, these figures give a fair representation of the situation. On the whole they appear to show that staple consumers' goods have had no great increase, as indicated by the slight growth of flour milling, slaughtering, cotton and woolen goods, and clothing. In each case, however, there have been interesting developments that can be discovered only by inspection of the movements of specific goods.

**Food Products.**—The principal trends in food consumption have already been discussed in the preceding section, but the discussion did not include the marked developments in the tobacco industry. Here there has been a notable shift in consumption. Industries manufacturing cigars, chewing and smoking tobacco, and snuff have had practically no growth, while the output of cigarettes has expanded at a phenomenal rate. Table 18 shows the growth of these industries since 1909, the first year for which detailed separate statistics for cigars and cigarettes were available.

TABLE 18.—GROWTH OF TOBACCO INDUSTRIES

	Production in millions	Number of wage earners	Primary horse power
<b>Cigars:</b>			
1909.....	6,668	129,518	a
1919.....	7,072	114,299	10,851
1925.....	6,501	96,036	9,271
<b>Cigarettes:</b>			
1909.....	6,819	8,159	a
1919.....	53,120	22,642	12,828
1925.....	79,960	21,072	15,263
<b>Manufactured tobacco and snuff:</b>			
1909.....	<sup>b</sup> 431	27,232	19,253
1919.....	<sup>b</sup> 424	18,324	18,893
1925.....	<sup>b</sup> 410	15,024	17,541

<sup>a</sup> Data not available separately.

<sup>b</sup> Millions of pounds.

In 1927 production of small cigarettes totaled over 97,000,000,000, over 25 times as many as in 1899. At the same time, only one-third more cigars were produced in 1927 than in 1899, and since 1914 there has been a slow steady decrease in the output of cigars and also of manufactured tobacco and snuff.

**Textiles and Clothing.**—The output of the textile and clothing group, including leather and its products, seems not to have grown as rapidly as that of other industries. It is, moreover, a general impression, supported in a measure by the available data, that there has been in these last years a relative reduction in the purchase of clothes. The total value of output of all industries engaged in the production of wearing apparel, including clothing, furnishings, millinery, knit goods, gloves, shoes, and hats, and the number of wage earners employed in these industries are shown in the following figures:

Year	Wage earners	Value of products
1914.....	923,105	\$2,241,753,411
1919.....	975,780	5,524,996,224
1921.....	884,035	4,556,655,408
1923.....	998,241	5,776,522,994
1925.....	932,106	5,499,854,690

Although these figures are not a satisfactory measure of physical output, they indicate the failure of these industries to grow in recent years, in marked contrast to the sharp increases in output of other goods. Certain types of apparel like millinery, lace goods, and men's furnishings have grown very rapidly.

Among the textile materials, the slow growth in output of the old staples has been in part offset by the great advance in the production of silks, rayon, and knit goods, on the one hand, and by such household articles as carpets and rugs, on the other. Thus, the imports of raw silk were 50,069,000 pounds in 1919, 63,764,000 pounds in 1923, and 74,005,000 pounds in 1927. The growth of rayon consumption, as can be seen in Table 19, is astounding. In poundage, rayon consumption now exceeds that of raw silk, but in value of output it ranks still much below silk.

TABLE 19.—GROWTH OF RAYON CONSUMPTION  
(In thousands of pounds)

Year	Consumption	Domestic production	Imports
1911.....	2,120	320	1,800
1919.....	9,246	8,174	1,072
1923.....	39,506	36,477	3,029
1925.....	57,343	51,902	5,441
1926.....	75,101	65,750	9,351
1927.....	96,271	80,594	15,677

**Electrical Appliances.**—The growing use of electricity and of electrical appliances is one of the most typical characteristics of our contemporary industrial civilization, with its tendency toward increasing mechanization and the use of labor- and time-saving devices, not only in the factory but in the home as well. The industry described in the census of manufactures as “electrical machinery, apparatus and supplies” has had a phenomenal growth in a short period. Its value of product of \$92,000,000 in 1899 had risen in 1925 to \$1,540,002,041, and in 1927 to \$1,637,307,035, and the number of wage earners employed in it from 42,000 in 1899 to 240,000 in 1925 and 246,500 in 1927. It is, moreover, one of those industries that has grown very fast since 1919, both by the rising output of old products and

TABLE 20.—VALUE OF SELECTED PRODUCTS OF ELECTRIC EQUIPMENT INDUSTRY  
(In thousands of dollars)

Class of product	1914	1919	1923	1925	1927*
Insulated wire and cable.....	69,506	128,682	184,472	210,617	209,703
Radio apparatus.....	792	8,075	54,000	176,990	191,228
Batteries and parts and supplies.....	23,402	92,463	118,066	155,248	150,216
Motors and parts and supplies.....	39,340	106,986	109,189	113,110	122,146
Generators, generator sets, and automotive starter motors.....	23,233	91,118	106,377	110,185	115,179
Telephone, telegraph, and fire alarm apparatus.....	24,272	50,956	97,124	87,922	119,271
Household heating and cooking appliances.....	3,465	38,748	63,915	75,102	72,933
Lamps, incandescent (bulbs).....	17,350	57,647	71,996	73,558	87,933
Switchboards, switches, etc.....	15,383	26,328	57,856	69,759	70,801
Transformers, etc.....	14,514	27,061	59,115	62,153	66,611

\* Preliminary estimate.

by the addition of new ones. Its variety is illustrated in Table 20 which shows the increasing production of selected products of the industry.

All of these figures indicate the pervasive character of electric consumption. The number of incandescent lamps produced in 1925, for example, was more than 450,000,000, in contrast with the output in 1914 of less than 100,000,000. The Census Bureau makes an annual canvass of lighting equipment for residential, commercial, industrial, street, and marine purposes, and finds the annual value of product to have increased each year beginning with 1923, when the total value was \$180,000,000 and ending with 1926, when value of output had risen to \$240,000,000. More important, however, is the increase in the production of electrical goods attributable to purchases by the ultimate consumer.

Here the growth has been large and variegated. The value of household electrical heating and cooking appliances was in 1914 less than \$3,500,000. By 1925 the value of output had risen to \$75,000,000 and included the range of appliances shown in Table 21.

TABLE 21.—PRODUCTION OF ELECTRIC HOUSEHOLD APPLIANCES

	1919	1923	1925	1927
All appliances: value.....	\$38,748,242	\$63,914,810	\$75,102,165	\$72,933,274
Vacuum cleaners:				
Number.....	977,339	1,240,742	1,107,592	1,091,632
Value.....	\$21,842,439	\$35,981,514	\$39,971,111	\$35,120,748
Flatirons:				
Number.....	1,407,822	2,434,280	2,936,361	2,937,258
Value.....	\$5,646,421	\$8,198,941	\$7,998,429	\$7,347,563
Domestic ranges, disk stoves, hot plates etc.:				
Number.....	"	"	301,717	366,055
Value.....	\$3,444,170	\$3,676,645	\$7,900,786	\$10,299,148
Air heaters:				
Number.....	"	310,363	495,615	306,112
Value.....	"	\$1,862,180	\$2,027,694	\$1,248,462
Percolators:				
Number.....	"	260,050	434,095	791,726
Value.....	"	\$2,340,446	\$3,593,496	\$4,297,395
Toasters:				
Number.....	"	476,606	735,856	1,209,484
Value.....	"	\$1,433,409	\$1,885,780	\$3,236,484
Waffle irons:				
Number.....	"	131,445	315,777	653,893
Value.....	"	\$788,669	\$1,864,257	\$3,601,411
Grills:				
Number.....	"	184,834	209,318	196,304
Value.....	"	\$923,369	\$577,628	\$301,541

" Comparable data not available.

Comparable data as to the value of electric washing machines produced are not available for all census years. The value reported for 1925 was nearly \$61,000,000. The total value of all washing machines,

clothes wringers and driers, and ironing machines, for domestic use, was approximately \$70,000,000 in 1925, \$57,000,000 in 1923, \$43,000,000 in 1919, and \$8,000,000 in 1914. The American Washing Machine Manufacturers' Association reports sales of washing machines, as shown in the following statement:

1923.....	718,429
1924.....	728,901
1925.....	882,499
1926.....	1,029,053
1927.....	944,506

No accurate figures on the production of electric refrigerators which produce their own ice are available. It has been estimated that 365,000 electrical refrigerators, with a value of \$82,000,000 were sold in 1927 as compared with 248,000 in 1926. As late as 1925, the production of ordinary refrigerators, moreover, showed no signs of being affected by the new device. In 1925 the value of product of the refrigerator industry was nearly \$58,000,000, having risen to this level from \$50,000,000 in 1923, \$26,000,000 in 1919, and \$15,000,000 in 1914.

**Radio.**—Probably the outstanding development in consumption in these past years has been the introduction of the radio. From a negligible figure of less than \$800,000 in 1914, from only \$8,000,000 in 1919 and \$11,000,000 in 1921, the value of radio apparatus produced increased to \$54,000,000 in 1923 and \$177,000,000 in 1925. Nearly three million loud speakers, and a million and a third head sets were produced in 1925. Output of complete receiving sets was about two and a half million in 1925 as compared with less than a half million in 1923. Because of the use of separate products in making the complete sets, there is considerable duplication in the figures of total value, but the quantity figures indicate that the number of radios produced in 1925 was at least double the 1923 output. The annual statistical survey of radio retailing made by the Department of Commerce gives information regarding the number of homes equipped with radio sets on January 1 and the annual sales of radio equipment at retail, as shown in the following tabulation:

Year	Sets in use on Jan. 1 (thousands)	Annual sales at retail (thousands)			
		Total	Sets	Parts	Accessories
1922.....	60	\$ 60,000	\$ 5,000	\$ 40,000	\$ 15,000
1923.....	1,500	136,000	15,000	75,000	46,000
1924.....	3,000	358,000	100,000	100,000	158,000
1925.....	4,000	430,000	165,000	65,000	200,000
1926.....	5,000	506,000	200,000	50,000	256,000
1927.....	6,500	446,550	168,750	21,000	256,800
1928.....	7,500	.....	.....	.....	.....

IV. THE AUTOMOBILE<sup>49</sup>

The real revolution in American consumption, involving not only radical changes in ways of living but also profound industrial consequences, is in large measure a function of the introduction of the automobile. It would be difficult to find anywhere in economic history so swift and pervasive a revolution. In 1910 there was one automobile to every 265 persons in the country; in 1917 one to every 22; in 1919 one to every 16; and on July 1, 1928, one to every 6. Since 1915 the annual production of passenger cars has been well over 1,000,000 a year, and since 1922 over 3,000,000 a year. Production of cars and trucks in 1925, 1926, and 1928 exceeded 4,000,000 units annually. The following tabulation of the registration of passenger cars and trucks shows to what degree this great advance in the use of automobiles has been a postwar phenomenon.

Year	Registration <sup>a</sup>	
	Passenger cars	Trucks
1919.....	6,771,074	794,372
1920.....	8,225,859	1,006,082
1921.....	9,346,195	1,118,520
1922.....	10,864,128	1,375,725
1923.....	13,479,608	1,612,569
1924.....	15,460,649	2,134,724
1925.....	17,512,638	2,441,709
1926.....	19,237,171	2,764,222
1927.....	20,230,429	2,896,886
1928.....	21,630,000	3,120,000

<sup>a</sup> National Automobile Chamber of Commerce, *Facts and Figures of the Automobile Industry*, 1928 edition, p. 6.

The figures of production and registration alone are sufficient evidence that the purchase and use of automobiles is participated in by all classes of the population. The statistics of the increase in the production of cars of low, medium, and high price<sup>50</sup> furnish only further confirmatory evidence.

In order to throw additional light on the types of people that buy automobiles and the conditions under which they are purchased, a sample study was made from the records for deliveries at retail by a large auto-

<sup>49</sup> The material for this section was prepared by Ralph C. Epstein, of the University of Buffalo. He desires to acknowledge his indebtedness to S. A. Stephens and Florence M. Clark for valuable assistance in analyzing the data in this section.

<sup>50</sup> Low-priced cars are defined as cars retailing at \$1,375 and under; medium-priced at from \$1,376 to \$2,775; and high-priced at \$2,776 and over.



TABLE 22.—ANNUAL PRODUCTION OF PASSENGER CARS, BY PRICE CLASSES<sup>a</sup>

Year	Number of cars		
	Low-priced cars	Medium-priced cars	High-priced cars
1907.....	13,285	14,427	8,672
1908.....	19,072	16,618	7,471
1909.....	56,284	38,625	29,939
1910.....	89,113	63,113	17,997
1911.....	95,536	48,134	18,506
1912.....	139,615	64,869	17,533
1913.....	262,867	109,251	20,086
1914.....	437,661	82,872	17,997
1915.....	657,695	207,507	15,287
1916.....	1,299,206	113,858	16,488
1917.....	1,588,100	156,436	21,253
1918.....	816,076	103,678	21,766
1919.....	1,201,586	359,882	37,067
1920.....	1,283,656	495,935	99,978
1921.....	1,049,666	306,563	96,252
1922.....	1,825,888	465,526	80,100
1923.....	2,999,205	562,127	64,610
1924.....	2,744,171	428,079	49,854
1925.....	2,992,176	701,106	71,717
1926.....	3,271,015	508,023	77,965

<sup>a</sup> Ralph C. Epstein, *The Automobile Industry: Its Economic and Commercial Development, 1928*, pp. 340-341, 344-345.

mobile distributor in an eastern industrial city with a population of over a half million, for the period from April 6, 1928, through June 15, 1928. The records included both the sales made by the distributor in the city in which the business is located and those made by a half-dozen or more subdealers doing business in surrounding small cities and towns. The make of the car to which the figures pertain is a popular one, selling in different chassis types which range in price roughly from about \$1,000 to \$1,600. The bulk of the sales are in models which, with full equipment, deliver at approximately \$1,100. The data are believed to afford a more or less typical cross section of the automobile market, except for purely agricultural localities. In order to obtain as accurate a picture of the channels of consumption as possible, commercial cars and passenger cars sold to corporations were excluded from the figures. The purchasers were then classified among the groups shown in Table 23. Where it was not clear from the original record to which group a listed occupation belonged, the procedure was followed of assigning the name to the higher of the two groups in question.

It is clear that a large proportion of the current purchases of passenger automobiles is made by the members of the wage-earning and lower salaried groups. These groups, moreover, apparently make substantial

TABLE 23.—SUMMARY OF SALES OF A MEDIUM-PRICED CAR, CLASSIFIED ACCORDING TO OCCUPATIONS OF PURCHASERS, NATURE OF CAR TRADED IN, AND TERMS OF PAYMENT (APRIL, MAY, JUNE, 1928)

Group	Terms	Trading in—		No trade	Subtotal	Total
		Same or better car	Cheaper car			
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Manufacturers, capitalists, bankers, brokers, merchants.	Cash	5.4	0.6	2.5	8.5	18.2
	Time	5.8	1.1	2.8	9.7	
Professional classes: Physicians, lawyers, teachers, engineers, etc.	Cash	2.1	1.7	0.6	4.4	9.4
	Time	2.5	0.8	1.7	5.0	
Subexecutive classes: Superintendents, foremen, etc.	Cash	3.1	0.7	0.8	4.6	9.6
	Time	1.9	1.4	1.7	5.0	
Salesmen and clerks.....	Cash	3.0	0.6	3.3	6.9	20.2
	Time	5.8	0.6	6.9	13.3	
Policemen, firemen, chauffeurs, motormen, etc.	Cash	1.2	0.3	0.2	1.7	5.0
	Time	1.0	0.6	1.7	3.3	
Laborers and artisans.....	Cash	2.8	1.4	3.0	7.2	23.6
	Time	5.6	3.9	6.9	16.4	
Housewives.....	Cash	1.1	0.0	0.8	1.9	4.7
	Time	1.1	1.1	0.6	2.8	
Farmers.....	Cash	0.8	0.6	0.0	1.4	3.4
	Time	0.6	0.6	0.8	2.0	
No occupation given.....	Cash	1.4	0.3	0.3	2.0	5.9
	Time	2.0	1.1	0.8	3.9	
Total.....		47.2	17.4	35.4	100.0	100.0

purchases by cash payment. In the labor and artisan group, also, the total number of sales involving no trades and the number involving the trading in of cheaper cars were nearly twice as great as the number of sales in which the same or better cars were turned in. For all the groups together, it is seen that 38.6 per cent of the total sales were made for cash and 61.4 per cent on time. As was to be expected, the proportion of cash buyers was larger among persons having cars to trade in than among those who bought new cars outright. It should be noted in this connection that while, in the groups of manufacturers, merchants, professionals, and subexecutives, the number of installment sales was almost matched by the number of cash sales, the ratio of installment to cash sales in the groups of salesmen, clerks, firemen and policemen, and laborers and artisans is more than two to one.

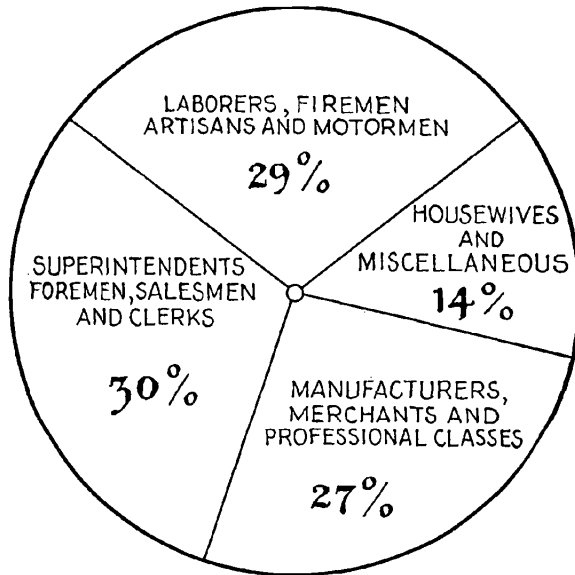
In the tabulation of these figures, numerous cash purchases by carpenters and machinists were noticed. Sometimes these sales involved the trading in of other cars, of which the following transactions are typical: a 1925 Ford, on which the allowance was \$120; a 1924 Dodge with an allowance of \$195, both sales being to carpenters. The new cars cost approximately \$1,100, so that the cash balance paid in each case was over \$900. Again, carpenters, machinists, crane operators, compositors,

bricklayers, waitresses, and laborers are all listed as buyers of new cars who not only paid cash for them, but had nothing to trade in with which to reduce the amount of cash they required.

While it is, of course, the case that both the initial price and the running expenses of automobiles have been much reduced in the past few years, both items still involve substantial expenditure. It has been estimated<sup>51</sup> that a typical 4-cylinder closed car of from 106- to 110-inch wheel base which cost \$1,500 in 1913, could be bought for \$760 in 1920 and \$600 in 1927. These comparisons take into consideration the change in the purchasing power of money, but cannot adequately reflect the fact that the car of 1927 is a product vastly superior to the car of 1913 or even 1920.

CHART 1.—PERCENTAGE DISTRIBUTION OF PASSENGER CAR SALES IN A PRIMARILY URBAN COMMUNITY, FOR APRIL, MAY, AND JUNE 1928

(See text for nature and source of data)



#### V. HOUSING<sup>52</sup>

We have since 1917 passed through two distinct phases in our residential housing situation. The first, which ended generally in 1922, was characterized by war restrictions on building, a great flow of population into the cities, severe shortage of housing, and considerable legislation designed to control the rise of rents. The second phase, which began in 1922 and has apparently not yet ended, was marked by unprecedented building activity affecting all types of buildings. The analysis of these

<sup>51</sup> By Ralph C. Epstein.

<sup>52</sup> The material for this section was prepared by Maurice Leven, Statistician, New York State Board of Housing. See also Chap. III, Construction, and Chap. V, Marketing.

changes in large statistical terms and the determination of their effects on the average general standard of housing in the country, involves comparison with past standards and not the discovery in the population of important groups whose housing facilities are below any of the requirements of decency and health. Unquestionably there are such groups, but the data regarding them are not well known. Whether their number, in the past decade, has been reduced cannot be determined, except by inference. Important as this question is, no extensive facts on it are available, and it is, consequently, considered here only as an incident in the general trend of housing standards.

The simplest measure of housing conditions is the physical supply of housing space, since housing standards may be expected to be better when there is an abundance than when there is a shortage of houses. No basic data exist which would permit reliable estimates of the total supply of housing in the United States, but estimates of the volume of residential construction will, over a period of time, serve as a reasonably accurate index of changes in the supply of housing. This volume has increased very rapidly since 1922. During the war, however, there was an appreciable reduction in building, and the problem of weighing the significance of the postwar increase is complicated by the necessity of determining the degree to which the recent gains in building only make up the war losses.

To determine how far the war shortage has been met by the recent construction, it is necessary to compare the present volume of construction with normal requirements. For this purpose it may be assumed that, except for temporary maladjustments, the population is usually adequately housed, in accordance with existing standards. Normally, therefore, construction is carried on chiefly to take care of the increase in population. Only a small fraction of new construction is necessary for replacements. On this basis it is fair to compare residential construction with population growth. Cumulative series of both population growth and the volume of construction, in which annual irregularities are smoothed out, should afford the proper material for such a comparison.

These cumulative data for the period since 1913 are presented in Table 24. In the four years prior to the American entry into the World War, there was an average construction of 209 square feet per person added to the population. When the war years are included, this average drops to 205 square feet. The postwar boom of 1919 not only wiped out all the shortage created during the war but raised the average to nearly 221 square feet. Then followed another two years with a low construction record, which again brought the average below the level established in the four years from 1913 to 1916. But, beginning with 1922, construction began a consistent upward movement, and by the end of 1927 the average residential construction per person added to the population was more than 286 square feet.

TABLE 24.—ESTIMATED RESIDENTIAL CONSTRUCTION IN THE UNITED STATES AND INCREASE OF POPULATION

Year	Residential construction (thousands of square feet)		Cumulative figures beginning with 1913			
	Reportable to F. W. Dodge Corporation in F. W. Dodge territory (eastern states)		Total United States <sup>a</sup>	Total residential construction (thousands of square feet)	Increase in population (thousands)	Residential construction per person added to population (square feet)
	27 states	36 states				
1913.....		<sup>b</sup> 215,087	307,268	307,268	2,069	148.5
1914.....		<sup>b</sup> 225,155	321,650	628,918	3,566	176.4
1915.....		<sup>b</sup> 245,220	350,314	979,232	4,911	199.4
1916.....		<sup>b</sup> 259,181	370,259	1,349,491	6,446	209.4
1917.....		<sup>b</sup> 165,595	236,564	1,586,055	7,708	205.8
1918.....		<sup>b</sup> 94,440	134,914	1,720,969	8,380	205.4
1919.....	<sup>c</sup> 241,880	<sup>c</sup> 273,324	390,463	2,111,432	9,566	220.7
1920.....	<sup>c</sup> 137,524	<sup>c</sup> 155,402	222,003	2,333,435	11,267	207.1
1921.....	<sup>c</sup> 204,575	<sup>c</sup> 231,170	330,243	2,663,678	12,990	205.1
1922.....	<sup>c</sup> 311,407	<sup>c</sup> 351,890	502,700	3,166,378	14,543	217.7
1923.....	<sup>c</sup> 354,257	<sup>c</sup> 392,747	561,068	3,727,446	16,521	225.6
1924.....	<sup>c</sup> 371,068	<sup>c</sup> 422,285	603,264	4,330,710	18,148	238.6
1925.....	<sup>c</sup> 470,207	<sup>c</sup> 540,509	772,156	5,102,866	19,879	259.3
1926.....	<sup>c</sup> 450,249	<sup>c</sup> 498,927	712,753	5,815,619	21,152	274.9
1927.....	<sup>c</sup> 434,956	<sup>c</sup> 474,276	677,538	6,493,157	22,665	286.5

<sup>a</sup> According to Mr. Thos. S. Holden, Chief Statistician, F. W. Dodge Corporation, the 36 states of the F. W. Dodge Corporation territory comprise seven-eighths of the total construction of the United States and the class of contracts reportable to F. W. Dodge Corporation constitutes about 80 per cent of the total. The estimates appearing in this column are an outgrowth of Mr. Holden's kind assistance. However, he is not responsible for any shortcomings in method or any errors. The estimates are necessarily rough.

<sup>b</sup> Estimated on basis of enameled baths shipments.

<sup>c</sup> Contracts awarded, as reported by F. W. Dodge Corporation—monthly averages for each year appear in *Survey of Current Business*.

<sup>d</sup> Estimated on basis of enameled baths shipments and F. W. Dodge Corporation figures for 27 states.

It is possible, moreover, to push the analysis of the supply of housing a step further. Table 25 represents an attempt to measure the excess or deficiency, with reference to normal requirements, in actual construction for each year from 1917 to 1927. The construction during the seven years, from 1910 to 1916 inclusive, has been taken as approximating the prewar normal. In that period residential construction amounted to roughly 220 square feet of floor area per person added to the nonfarm population.<sup>53</sup> Multiplying the increase in nonfarm population, shown in Column A of Table 25, by 220, we obtain the figures of normal building requirements, shown in Column B. The difference between actual construction and these normal requirements is here regarded as the measure of shortage or surplus.

<sup>53</sup> The nonfarm population is here used because the bulk of construction in recent years was for this class of the population.

TABLE 25.—CUMULATIVE DIFFERENTIALS OF RESIDENTIAL BUILDING CONSTRUCTION ABOVE OR BELOW PREWAR NORMAL REQUIREMENTS, 1917-1927

Year	Cumulative nonfarm population increase (thousands)	Normal building requirements <sup>a</sup> (millions of square feet)	Actual construction (millions of square feet)	Differential construction above or below normal <sup>b</sup>		
				Millions of square feet	Per cent of prewar normal requirements	Surplus persons provided for (thousands)
1917.....	1,283	282	237	- 45	-16.0	-205
1918.....	1,965	432	372	- 60	-13.9	-273
1919.....	3,157	695	762	67	9.6	305
1920.....	4,892	1,076	984	- 92	- 8.6	-418
1921.....	6,675	1,469	1,314	-155	-10.6	-705
1922.....	8,298	1,826	1,817	- 9	- 0.5	- 41
1923.....	10,376	2,283	2,378	95	4.2	432
1924.....	12,115	2,665	2,981	316	11.9	1,436
1925.....	13,764	3,028	3,753	725	23.9	3,295
1926.....	15,357	3,379	4,466	1,087	32.2	4,941
1927.....	16,970	3,733	5,144	1,411	37.8	6,414

<sup>a</sup> 220 square feet of floor area per person of nonfarm population increase. This is approximately the average amount built during the seven-year period preceding the entry of the United States into the World War, 1910-1916 inclusive.

<sup>b</sup> A minus sign (-) indicates below normal.

So measured, the volume of construction during and immediately after the war was apparently not seriously below normal requirements. At no time did construction fall more than 16 per cent of the prewar normal,<sup>54</sup> and since 1923 there has been a rapid accumulation of new residential buildings. If it be assumed that, at the end of 1916, there was neither a deficiency nor a surplus, the accumulation above normal requirements reached 1,411,000,000 square feet of floor area in 1927. This amount of space is sufficient to accommodate, at the prewar rate of 220 square feet per person, a surplus in population of about 6,400,000. This does not mean that there is at present an oversupply, since the standards of housing have, meanwhile, steadily advanced. Much of the old type of housing has become obsolete and either remains vacant or has been demolished.<sup>55</sup>

**The Quality of New Residential Construction.**—Lacking any other simple and equally satisfactory test of quality, probably the best measure of it is cost. Estimates of cost are based on the value of contracts awarded in 27 eastern states, as reported by the F. W. Dodge Corporation. The value per square foot of floor area is shown in Table 26 in terms of both current and 1913 dollars. The figures show an unmistakable and substantial rise from 1923 on. This means, of course, that

<sup>54</sup> The war housing shortage was probably particularly acute because it was concentrated in the larger cities and there caused serious congestion.

<sup>55</sup> See Obsolescence, Chap. III, Construction, p. 226.

on the average more and more expensive homes have been built since 1920. Some of this, however, is owing to the change in the type of buildings now erected. There has, in recent years, been a marked disproportionate increase in the construction of multifamily or apartment houses. These require more expensive materials and construction than single-family frame houses, and the cost per square foot of floor area of the mere shell is accordingly higher.

TABLE 26.—VALUE PER SQUARE FOOT OF RESIDENTIAL BUILDING CONTRACTS AWARDED IN 27 EASTERN STATES, 1919-1927

Year	Value per square foot of floor area		Year	Value per square foot of floor area	
	Current dollars <sup>a</sup>	Dollars of 1913 value <sup>b</sup>		Current dollars <sup>a</sup>	Dollars of 1913 value <sup>b</sup>
1919.....	3.51	1.72	1924.....	4.97	2.38
1920.....	4.12	1.60	1925.....	5.02	2.47
1921.....	4.29	2.11	1926.....	5.20	2.60
1922.....	4.33	2.35	1927.....	5.35	2.64
1923.....	4.47	2.14			

<sup>a</sup> Based on F. W. Dodge Corporation statistics.

<sup>b</sup> Deflated by means of index of cost of construction.

**Sanitary Equipment.**—Some suggestion of the advance in the equipment of the modern American house has already been had from the survey of the consumption of manufactured goods. The varied list of commodities and appliances which appear to make the difference between what people regard as convenient, comfortable, and healthy living and the reverse are considered in some further detail. The actual status of sanitary equipment in American homes is shown in Table 27.

TABLE 27.—SANITARY EQUIPMENT OF HOMES IN URBAN COMMUNITIES,<sup>a</sup> 1925-26

Sanitary home equipment	Per cent of dwellings equipped	Size of sample	
		Number of dwellings (thousands)	Number of communities
Stationary kitchen sinks.....	83.9	3,909	1,454
Flush toilets.....	82.2	3,311	1,301
Stationary bathtubs.....	68.3	2,246	1,155
Stationary wash basins.....	71.3	2,112	1,084
Stationary laundry tubs.....	28.3	1,943	1,031

<sup>a</sup> Results of Urban Home Equipment Survey (1925-26), General Federation of Women's Clubs. This survey was made under the direction of the Industrial Survey and Research Service, Washington, D. C.

TABLE 28.—NUMBER OF SANITARY BATHTUBS, TELEPHONES, AND WIRED HOMES COMPARED WITH TOTAL NONFARM POPULATION, 1913-1928

Year (Jan. 1)	Estimated <sup>a</sup> nonfarm population	Homes equipped with stationary bathtubs		Residence telephones Bell System		Wired homes (domestic electric light and power customers)	
		Total number <sup>b</sup>	Number per thousand nonfarm popula- tion	Total number <sup>c</sup>	Number per thousand nonfarm popula- tion	Total number <sup>d</sup>	Number per thousand nonfarm popula- tion <sup>e</sup>
	(Thousands)	(Thousands)		(Thousands)		(Thousands)	
1913.....	64,545	7,066	109.5	2,800	43.4	3,101	48.0
1914.....	66,534	7,520	113.0	3,050	45.8	.....	.....
1915.....	68,021	8,004	117.7	3,275	48.1	.....	.....
1916.....	69,376	8,540	123.1	3,500	50.4	.....	.....
1917.....	70,941	9,123	128.6	3,864	54.5	5,260	74.1
1918.....	72,223	9,501	131.6	4,148	57.4	5,800	80.3
1919.....	72,905	9,722	133.4	4,228	58.0	6,900	94.6
1920.....	74,097	10,116	136.5	4,545	61.3	8,010	108.1
1921.....	75,832	10,702	141.1	4,903	64.7	8,700	114.7
1922.....	77,615	11,175	144.0	5,260	67.8	9,430	121.5
1923.....	79,238	12,028	151.8	5,653	71.3	10,211	128.9
1924.....	81,316	13,059	160.6	6,230	76.6	11,819	145.3
1925.....	83,055	14,150	170.4	6,798	81.8	13,567	163.3
1926.....	84,704	15,410	181.9	7,306	86.3	14,965	176.7
1927.....	86,297	16,545	191.7	7,875	91.3	16,359	189.6
1928.....	87,910	17,591	200.1	8,333	94.8	17,596	200.2

<sup>a</sup> Based on W. I. King's estimates of total population and census figures of farm population (1920 and 1925).

<sup>b</sup> Estimated on basis of percentage of homes having stationary bathtubs in 1925 as determined by Urban Home Equipment Survey of General Federation of Women's Clubs, and shipments of enameled baths.

<sup>c</sup> Courtesy of S. L. Andrew, chief statistician, American Telephone and Telegraph Company. According to Dr. Andrew, in addition to the telephones in the Bell System, there are (July, 1928) some 4,800,000 telephones which are operated by other companies, about two-thirds of which are residence telephones.

<sup>d</sup> Compiled and estimated by G. F. Wittig, statistical editor, (*Electrical World*, Jan. 7, 1928, p. 32).

<sup>e</sup> The number of farm electric light customers is comparatively small. The statistics of wired homes are therefore almost 100 per cent nonfarm. Of the total of 11,814,000 customers at the beginning of 1924, only 165,000 or about 1.4 per cent were farmers (National Electric Light Association, *Facts and Figures*, March, 1928, p. 21). By now the number of farmer customers may have increased to about 300,000. But this is still less than 2 per cent of the total. Consequently, the error introduced by using total electric light customers in computing the rate per 1,000 nonfarm population is negligible. It should be stated that the number of electrified farms is greater than is indicated by the figures just discussed. These figures do not include farms with independent generating units. Of these, there were about 300,000 at the end of 1923.

In 1925, according to this survey, 68.3 per cent of the urban homes had stationary bathtubs. On the basis of this percentage it is estimated that, at the beginning of 1925, there were about 14,100,000 stationary bathtubs in the homes of the nonfarm population of the United States.



This figure was projected back for each year from 1913 on, and further estimates were made for the years since 1925 by the use of the statistics of the annual shipments of enameled baths. Of the 11,000,000 baths installed during the 15 years since 1913, only slightly more than 4,000,000 were installed during the first nine years and 7,000,000 in the six years beginning with 1922. The rate of installation was, thus, 1,100,000 a year during the second period and 480,000 in the first.

**Residence Telephones and Wired Homes.**—According to reliable estimates there are at present about 11,530,000 residence telephones in the United States, or about one telephone for every 2.5 residences. Between 1918 and 1928 the number of residence telephones of the Bell System more than doubled. At the same time the nonfarm population, which is in the main served by the Bell System, increased only 21.5 per cent. The progressive electrification of American life has already been discussed in an early section of this chapter. Further data are presented in Table 28 on page 67.

The number of resident customers of electric light and power companies in the United States rose from 3,100,000 in 1913 to 17,600,000 in 1928. In 1913 there were only 48 wired homes per 1,000 nonfarm population; by the end of 1927 this number had risen to 200. Counting only four persons to the family, the degree of electrification of American homes, exclusive of farms, has reached 80 per cent. Assuming the standard family of the 1920 census, this percentage would be 86 as contrasted with 20 in 1913.

**Household Appliances and Furnishings.**—The foregoing picture of the advance in the quantity, quality, and equipment of American housing since 1922 is not complete without at least some reference to the variety of goods that are for convenience included in this last category. The radio and the many types of household electrical appliances have been described before. The remaining group of household goods, included in Table 29, shows, except in the case of the piano and the phonograph, a

TABLE 29.—ADJUSTED<sup>a</sup> VALUES OF DIFFERENT HOUSEHOLD GOODS MANUFACTURED IN THE UNITED STATES

(Millions of 1913 dollars)

Goods	Census year			
	1919	1921	1923	1925
Phonographs.....	86	50	59	36
Pianos.....	58	38	61	60
Household furniture.....	274	238	317	373
Oilcloth, linoleum, and asphalted-felt-base flooring	37	32	52	56
Woolen carpets and rugs.....	67	53	109	112

<sup>a</sup> Value of product as reported in the Census of Manufactures divided by wholesale price index of household furnishing goods of the United States Bureau of Labor Statistics.

substantial per capita advance. In the period from 1919 to 1925, when population was not growing fast and when there was no material change in the export and import of these wares, the deflated value of output of household furniture increased 36 per cent, of oilcloth and linoleum products 51 per cent, and of carpets and rugs 67 per cent.

**Water Consumption.**<sup>56</sup>—Water consumption appears to be not only an interesting index of the sanitary standard of living in the United States, but the comparative data throw considerable light on the variation in sanitary standards in the United States and in Europe. Although the statistics of the per capita daily consumption of water are hard to subject to refined interpretation, because they vary with the degree of control over the water supply, either through the use of meters or through the scarcity of water, and because it is generally not possible to separate the domestic from the industrial consumption, the disparities between prevailing American and foreign conditions are so marked as to command attention. Table 30, showing the per capita daily water consumption in selected American and European cities, illustrates the striking differences in levels. While some of the large variations among the American cities are due to the presence or absence of meters or the different proportions of industrial and domestic consumption, it is nevertheless the fact that

TABLE 30.—DAILY PER CAPITA WATER CONSUMPTION, IN SELECTED AMERICAN AND EUROPEAN CITIES

Country and city	Year	Per capita daily consumption of water
		<i>U. S. gallons</i>
Germany:		
Berlin.....	1927	37.8
Hamburg.....	1927	37.0
England:		
London.....	1927	43.4
Manchester.....	1927	42.3
France: Paris.....	1927	47.2
Holland:		
Amsterdam.....	1926	30.0
Rotterdam.....	1926	35.0
United States:		
Baltimore.....	1927	129.0
Chicago.....	1927	292.8
Cleveland.....	1927	127.9
Detroit.....	1927	126.0
New York.....	1927	142.0
Philadelphia.....	1927	168.0

<sup>56</sup> The material on water consumption was prepared by Abel Wolman, Chief Engineer, Maryland State Department of Health, and Editor, *Journal of the American Water Works Association*.

domestic consumption is from two to three times that of the cities of Europe.<sup>57</sup>

Analysis of changes in the per capita consumption of water over a period of years is almost impossible because of the confusing factors that have already been mentioned. The chief engineer of the New York City Bureau of Water Supply has, however, furnished the figures of per capita daily water consumption for domestic and public use, excluding industrial use, in New York City from 1910 to 1926. They are as shown, in U. S. gallons, in the following tabulation:

Year	Daily per capita consumption	Year	Daily per capita consumption
1910.....	79.1	1919.....	88.3
1911.....	72.9	1920.....	98.5
1912.....	72.4	1921.....	96.9
1913.....	69.8	1922.....	97.1
1914.....	77.5	1923.....	95.8
1915.....	74.6	1924.....	96.9
1916.....	78.9	1925.....	103.5
1917.....	82.7	1926.....	103.2
1918.....	90.5		

The fluctuations from year to year, sometimes great, are the result of numerous temporary and accidental factors. The increase in recent years since 1918 is in part a reflection of the growth of building and of sanitary equipment. The quick and unusual rise in 1920 was in part due to the abnormally cold winter of 1919-20, and the rise in 1925 in part to an unusually hot summer.<sup>58</sup>

#### VI. THE STANDARD OF LIVING OF THE FARM POPULATION<sup>59</sup>

The urban and industrial and commercial prosperity in the United States for the past seven years has not had its counterpart among our farm population. The peculiar economic problems of American agriculture are the subject of comprehensive analysis elsewhere in this survey.<sup>60</sup> Here it is proposed to deal mainly with those items that throw light on the farmers' standard of living in the years following the close of the World War. The difficulties that are always encountered in measuring

<sup>57</sup> It is interesting to point out in this connection that a daily per capita consumption of 400 gallons in Beverly Hills, California, is said to be the highest in the country. The water system there is 100 per cent metered, and the consumption of water is virtually all domestic. The large per capita use is explained by the unusually high proportion of baths, private swimming pools, and lawn area.

<sup>58</sup> Letter from William W. Brush, Chief Engineer, New York City Bureau of Water Supply.

<sup>59</sup> The material for this section was prepared by C. J. Galpin, Economist in charge, Farm Population and Rural Life, Bureau of Agricultural Economics, United States Department of Agriculture.

<sup>60</sup> See Chap. VIII, Agriculture.

the standard of living of any population are even greater in assessing the changing status of the farm population. Direct budgetary studies of farmers' incomes and expenditures are of very recent origin. The studies since 1919 are not annual and do not cover identical families in representative agricultural sections. The answer to the important question whether the increase, between 1920 and 1925, of half a billion dollars in the mortgage indebtedness on farms owned by their operators was largely due to the turning of floating debts, incurred for family subsistence, into land mortgages is not known. We are, consequently, thrown back on various criteria of prevailing and past standards which, while inadequate, are informative.

Defining farm population as "all persons living on farms" and applying to this population such evidences of changing standards of living as the movement of population from and to the farms, changes in farm income and expenditures, and the purchasing power of farm products, it is possible to reach some conclusions regarding the character of farm living standards since 1919.

There are and have been among American farmers two levels of standards of living, an upper and a lower level, each the product of historical conditions that have distributed our farm population on good and poor land. The standards of both have been substantially maintained since 1919, on the one hand, because the reduction in farm population has left a smaller number of persons to live on the products of farm labor and, on the other, because the farmers have drawn upon savings, credit, and mortgage debt to protect the standards to which they had become accustomed. Farmers have shared with the rest of the population the benefits of invention and new goods, which have been already described. For the future, finally, the farmers on poor land face the very difficult problem of improving their present material standards.

**Classification of Farm Population.**—In 1925 the total farm population in the United States was 28,981,668. Of this total, 38.5 per cent lived on farms, in counties where the average value per acre for the farm land and buildings was under \$40; 61.5 per cent, on farms averaging in like manner \$40 and over. The first type may properly be regarded as poor land and the second as good land. The farm population, therefore, falls into two classes, the one on the lower level working poor land, and the other, on the upper level, working good land. If the farm population living on the poor land were all on farms of comparatively the same acreage, the handicaps of poor land would be more or less equally distributed. As it is, the farms on poor lands in the eastern sections of the United States are on the average relatively small, while those on poor land in other sections, notably the western mountain areas, are relatively large. The farm population may, therefore, again be divided into two classes, the first consisting of all persons who live on farms of which

the average value per farm of the land and buildings is under \$4,000, and the second of all persons who live on farms with an average value of \$4,000 and over. By this classification, 42.2 per cent of the total farm population live on low-value farms and 57.8 per cent on high-value farms. It appears fair to say that the farm population of the United States is made up of two classes, possessing different standards of living, due in the main to historical differences in soil, topography, and income.

Those who live on low-value farms have customarily eked out a small farm income by hiring themselves out for wages off the farm. In a sample study of 300 farm families in counties of the low-value class, the average gross cash income from the farm was \$804, while farm expenses were \$580, leaving a surplus for living expenses of only \$224. The farm itself in rent, garden, grains, etc., contributed an estimated income of \$401, and outside work of members of the family added \$321 in wages. The farm does not support the family. From 1919 to 1927 this class of the farm population has not improved its standard of living, but its standard appears also not to have suffered much of a decline.

**The Movements of Population between Farms and Cities.**—The movement of population from and to the farm may be regarded as one index of the relative economic and social status of agriculture. Unfortunately our information on this matter does not extend far back. For the more recent years the United States Department of Agriculture has made estimates of the net movement from farms to cities and of the net loss in farm population since 1910. In recent years there has been an annual movement from farm to cities of approximately 2,000,000 persons and a return movement of considerably more than 1,000,000 persons. The estimated net loss in farm population,<sup>61</sup> resulting from this excess migration into cities, during the total periods 1910-1920 and 1920-1925 and in the calendar years 1925, 1926, and 1927 is shown in the following statement:

1910-1920.....	(estimated) 463,000
1920-1925.....	(U. S. Census enumerations) 2,000,000
1925.....	(estimated) 441,000
1926.....	(estimated) 649,000
1927.....	(estimated) 193,000

Analysis of these figures indicates that there are four streams of persons away from farms. There is the stream of young adults, male and female, ready for city careers; the stream of older adults, still vigorous in mind and body, seeking better returns than they received from farming; the prosperous adults of middle age turning to the city for standards of consumption not possible on the farm; and the adults forced by age and

<sup>61</sup> Net loss equals the number of persons leaving farms for cities added to the number of persons who died, and from this sum is taken the number of persons going to farms from cities added to number of births.

heavy work to abandon farming. Further light is thrown on this movement by a study of the United States Department of Agriculture of a representative sample of several thousand migrants between 1919 and 1926.<sup>62</sup> The study shows that of those leaving the farm for the city 38 per cent moved on account of economic distress, 25 per cent by reason of physical disability, 11 per cent to find better educational facilities for their children, and 2.5 per cent to enjoy the comforts of the city. Of those who left the city to return to farms, 87 per cent had either farmed before as owners, tenants, or hired men, or had been farm born and farm reared. Of all who returned to the farm, 27 per cent gave as their reason healthier living conditions for their families, 30 per cent the high cost of living and lack of steady employment in cities, 20 per cent dislike of city work and life, and 7 per cent the freedom and independence of farm life.

It is seen from these data that over one-third of those who left farms did so because they could not make ends meet through farming. Thus, the pressure of competition has forced out some of the inefficient and unfortunate. The more efficient remained and weathered the storms, maintaining their standards through income, savings, or credit, or by reducing them where neither health nor present social status was impaired.

**Detailed Studies of the Farmers' Standard of Living.**—The United States Department of Agriculture, in co-operation with the state colleges of agriculture, has made detailed studies<sup>63</sup> of the annual family consumption and expenditures of 5,000 farm families situated in 15 states. These consumption studies began in 1919 and continued year after year till 1928. The 15 states are as follows: New Hampshire, Vermont, Massachusetts, Connecticut, New York, Kentucky, Tennessee, South Carolina, Alabama, Texas, Missouri, Kansas, Iowa, Ohio, and Minnesota. The studies are regionally representative of the United States, with two exceptions, *viz.*, the Mountain and Pacific sections, which contain, however, only about 7 per cent of the total farm population. The studies are highly representative also of the farm families living in counties, where the average value per farm and per acre of land and buildings is on the upper level. In fact, a part of the studies will well represent the farm population of the upper level of agriculture (upper incomes, upper values of land and buildings per acre, upper value per farm); while another part will represent, though not so fully or so convincingly, the lower level of agriculture, mainly because fewer studies in the lower level of income and land values have been made. There is no doubt, however, as to the approximately representative character of the results presented in this lower level.

<sup>62</sup> "Analysis of Migration of Population to and From farms," (mimeograph report).

<sup>63</sup> Department *Bulletins* Nos. 1214, 1382, 1466: mimeographs of years, 1925, 1927, 1928.

The upper level covers, it will be recalled, 57.8 per cent of the farm population of the United States, when we take the total farm population of all the counties whose farm values average, per county, the sum of \$4,000 and over. For this class in the year 1919, the average total expenditures of 861 families situated in three states was \$1,436; in 1921, the average for 402 families in one state was \$1,979; in the years 1922-1924, the average for 2,886 families in 11 states was \$1,597.50; in 1924, the average for 25 families in one state was \$1,329.20. It is well to remember at this point that in counties where the average level of land and farm values is high, due to soil and topography, there will be families with a variety of incomes from the low to the high. These studies took a representative sample of each county and so took all grades of families. For example, in the 1919 study of 861 families, although the average expenditure was \$1,436, there were 7 families with expenditures below \$300; 69 families with expenditures from \$300 to \$599; 191 families, from \$900 to \$1,199; 138, from \$1,200 to \$1,499; 104, from \$1,500 to \$1,799; 87, from \$1,800 to \$2,099; 55, from \$2,100 to \$2,399; 34, from \$2,400 to \$2,699; 10, from \$2,700 to \$2,999; 38, \$3,000 and over. Likewise, in the 1922-1924 studies in 11 states in which the average expenditures were \$1,597.50, there were 58 families with expenditures below \$600; 280, from \$600 to \$899; 579, from \$900 to \$1,199; 614, from \$1,200 to \$1,499; 492, from \$1,500 to \$1,799; 332, from \$1,800 to \$2,099; 196, from \$2,100 to \$2,399; 116, from \$2,400 to \$2,699; 83, from \$2,700 to \$2,999; 136, \$3,000 and over.

The distribution of expenditures among the various elements of living shows significant change. The percentages of the total budget assigned to food and clothing are fairly constant in all the regions in all the years; housing (estimated arbitrarily at 10 per cent of the value of the house) varies from a low of \$94.60 in 1924 and \$137 in 1919, to a high of \$234 in 1921 and \$199.60 in 1922-1924. The element of advancement (which includes expenditures for education aside from taxes, for churches, benevolences, recreation, and reading) varies from a low of \$45.10 in 1925 and \$84.30 in 1919 to a high of \$255 in 1921 and \$104.80 in 1922-1924.

One noteworthy result of this study of 2,886 families are the figures of the annual cost of the use of the automobile for household purposes. The average cost of the use of the automobile per family varies from \$56.90 in the New England states to \$68.70 in the Southern states and to \$93.30 in the North Central states. It should be noted that these costs are averages for all families in each section and therefore do not represent the actual cost (for household purposes), since not all the families reported use of the cars. Of the 317 families of New England, 167, or 52.7 per cent, reported the ownership and use of an automobile. For the 167 families owning and using cars, the expenditures amounted to \$108 per family. Of the 1,130 southern families, 611, or 54.1 per cent, reported

the use of automobiles, for which families the expenditures for the car amounted to \$127. Of the 1,439 families of the North Central states, 1,126 or 78.2 per cent, were using automobiles for household purposes. For these 1,126 families, the costs of the car attributable to household use averaged \$119.

The small average expenditure for the use of horse and buggy for household purposes, \$8.70 per family, is also interesting. This average varies widely for the three sections. Less than one-sixth of all families reported the use of horse and buggy. Of the 458 families reporting expenditures for this purpose, 50 were from New England states, 332 were from Southern states, and 76 were from North Central states.

In the class of a low level of land and farm values only two studies are presented; one in the hill country of New York State, taken in 1924, the other a more typical section of the low-value country, in the hills of southeastern Ohio, taken in 1927.

The average total values of all expenditures of 498 families in New York in 1924 was \$1,077.60, in 300 families in Ohio, in 1927, \$933. In the first study there were 10 families expending for their living a total below \$600; 153 families, from \$600 to \$899; 189, from \$900 to \$1,199; 94 from \$1,200 to \$1,499; 35, from \$1,500 to \$1,799; 10, from \$1,800 to \$2,099; 7, \$2,100 and over. In the second study, which is more typical of the low-value and low-income areas, there were 49 families spending less than \$600; 102, spending from \$600 to \$899; 93, from \$900 to \$1,199; 56, spending \$1,200 and over. This grouping of expenditures shows what is well known, that even in regions of prevailingly poor land and low incomes there are farm families that far exceed the mass in income and expenditure, just as in areas of prevailingly high land values and a high level of income there are families with low incomes and low expenditures for living. The items for housing, clothing, and advancement, in these regions of low land values and incomes, are outstandingly on a lower standard than in the region of high land values.

As a general commentary on farmers' standards of living, it is interesting to note the estimated number of farm-owned automobiles and to compare those figures with the estimated number of farms in the United States, in 1925, of 6,371,640. Estimates of the number of farm-owned automobiles, made by the *Farm Journal* of Philadelphia, are shown in the following figures:

Year	All motor vehicles	Passenger automobiles
1924 . . . . .	3,821,085	3,453,159
1925 . . . . .	4,332,482	3,853,526
1926 . . . . .	4,528,422	4,028,640
1927 . . . . .	5,007,124	4,408,470



**Income and Purchasing Power.**—Table 31<sup>64</sup> shows the average disposable income of the farmer derived from the farm business. The year 1919-20 was high; the two following years very low; a slight upward movement reached its peak in 1925-26, was followed by a decline again in 1926-27, and a recovery in 1927-28. House rent is not included in this figure of income.

TABLE 31.—AVERAGE DISPOSABLE INCOME OF THE FARMER DERIVED FROM FARM BUSINESS

Year	Income available for capital, labor, and management <sup>a</sup>	Interest allowance on net capital investment per farm <sup>b</sup>	Reward for labor and management
1919-20.....	\$1,246	\$329	\$917
1920-21.....	684	287	397
1921-22.....	514	244	270
1922-23.....	682	242	440
1923-24.....	766	233	533
1924-25.....	854	230	624
1925-26.....	922	232	690
1926-27.....	862	226	636
1927-28.....	886	229	657

<sup>a</sup> Net income available for operators' capital, labor, and management calculated on the basis of the number of farmers interpolated between 6,448,000 in 1920 and 6,372,000 in 1925.

<sup>b</sup> Interest allowed on operators' net capital investment at 4.5 per cent.

The purchasing power of the farmer's product is another limiting factor in his standard of living, indeed competing in significance with income itself. The following figures, prepared by the United States Department of Agriculture,<sup>65</sup> give the relative purchasing power of the farmer's product, when the price he receives for his commodities is compared with the retail price of the commodities he buys, for the period 1919 to 1927. The base taken is the average prices for the period 1910-1914.

	1919	1920	1921	1922	1923	1924	1925	1926	1927
Relative purchasing power of farmer's product.....	102	99	75	81	88	87	92	87	85

## VII. SUMMARY

Current impressions of the prevailing standards of living in the United States rest in the main on well-known index numbers of real earnings. All such measures point to a substantial rise in American standards in the past six years and probably to a considerable widening of the margin between American and European standards of material well-being as contrasted with the state of affairs before the war.

<sup>64</sup> *Crops and Markets*, United States Department of Agriculture, July, 1927.

<sup>65</sup> *Ibid.*, July, 1928.

Such measures are defective because they do not account for all of the elements of family income, on the one hand, and also because they fail to make proper allowance for fundamental changes in the amount, quality, and character of the things people buy and use. It is neither possible to discover and measure all sources of family income nor to account completely for far reaching changes in consumption. Certain types of income can, however, be estimated and the outstanding changes in consumption described. For instance, the income represented by the free public services of education, charity, recreation, and health and sanitation increased from \$859,336,000 in 1915 to \$2,860,935,000 in 1926.

Surveys of the use of food, manufactured goods, automobiles, and housing reveal radical modifications in the habits of American consumption. New studies of family budgets will be necessary to correct erroneous impressions and to throw light on the sources and magnitude of prevailing family income.

Physiologically, per capita food requirements have declined, and are still tending to decline, especially in respect to quantities required for maintaining body heat and furnishing energy for work. With higher incomes per capita, higher standards of wholesomeness due to trade action and public inspection, a wider variety of foods available in all seasons and in all parts of the country, fuller knowledge of nutrition, and more widespread information on dietetics, there is reason to believe that the actual diets of to-day more nearly meet the physiological needs than has ever been true for the population as a whole.

Food standards have risen notably in respect to auxiliary satisfactions derived from food. The diet of to-day contains an unprecedented proportion of elements appealing to the appetite, the senses of sight, taste, and smell, and other aesthetic desires. It is strikingly diversified in the individual meal, from meal to meal, from day to day, from season to season. It is eaten with a substantial degree of assurance that the elements are wholesome. It permits of ready adjustment to individual idiosyncracies of need or taste, and to changes in the family income.

Present day food standards have also risen greatly in respect to economies in household expenditures of time and effort. To an increasing extent, food is purchased for the needs of the day. Less and less household labor is required in preparation, preservation, and storage.

The present diet is expensive in the sense that it entails a larger expenditure of purchasing power than is true in most other countries, or than was true in the United States in earlier years. Increasing congestion of population alone tends toward higher costs of distribution, which have been only partially offset by economies in production and marketing. Many of the gains already mentioned have entailed additional costs which are, for the most part, reflected in the prices of particular foods or food outlays as a whole. This is especially the case in

respect to economies in household efforts, for small packages, prepared foods, prompt delivery, etc., entail heavier costs than bulk purchases of foods in an unprepared state, carried home by the consumer.

Considering, however, the character of the food consumed and the size of consumers' incomes, food costs can not be accounted heavy. By and large, a smaller proportion of the family income is required, under present conditions, to secure a safer, better balanced, more varied, more appetizing diet than formerly.

There is still room for substantial improvement in food standards and substantial economies in food costs. While dietary improvements have been almost universal, large classes of the population can well make further advances in each of the three lines indicated. Avoidable malnutrition has not been eliminated. Much misinformation is widely circulated. Ideal standards of wholesomeness and honesty are by no means attained. Wastes of foodstuffs and of labor in connection with food are excessive from producer to consumer. Apart from the matter of suitable diets from the standpoint of nutrition, the food problems pressing for solution in America to-day are less those of the consumer, and more largely those of the farmer, the manufacturer, the wholesaler, and the retailer.

In the heterogeneous category of manufactured goods, the striking rise in output and, hence, in consumption has come in the manufacture of many mechanical articles of household equipment and of such new devices as the radio. The dramatic revolution, of course, is represented by the growth in the use of the automobile and by a current production of more than 4,000,000 cars a year.

Staple consumers' goods have not shown a great increase, as indicated by the slow growth of flour milling, slaughtering, cotton and woolen goods, and clothing. The industries manufacturing cigars, chewing and smoking tobacco, and snuff, have shown practically no growth, while the output of cigarettes has greatly expanded. In the textile and clothing group, including leather and its products, there has been no marked growth except for millinery, lace goods, and men's furnishings. Among textile materials there has been a great advance in the production of silks and rayon, knit goods, and carpets and rugs.

The volume of residential construction has increased more rapidly than population, and the quality of housing appears to show marked improvement, although very little material is available to show how large a part of our wage-earning population is still inadequately housed.

More than 40 per cent of the total farm population now living on low-value farms have not improved their standards of living in the period under review, and appear to have sustained such standards as they have by the use of a vast mortgage indebtedness. The 57.8 per cent of population living on high-value farms presumably have raised their standard since 1922.