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CHAPTER 3

THE DISTRIBUTION OF THE NATIONAL INCOME

The data from which Mr. King made the Estimate by Sources of Production enabled him to divide the value product of each industry into two parts: first, payments to employees; second, interest and rent payments to individuals, and profits. Similarly, the income-tax exemption limit led Mr. Knauth to divide the Estimate by Incomes Received into two parts: incomes over, and incomes under, $2,000. Both these divisions possess interest, and together they form a good introduction to the rather technical study of the distribution of all incomes among persons which has been made by Mr. Macaulay.

I. THE SHARE OF EMPLOYEES IN THE NATIONAL INCOME

The percentage of the value product of an industry paid to *employees* for their services is not at all the same thing as what is sometimes referred to as the "share of labor" in the product

of that industry. For there is a great deal of work done that is paid for not in the form of agreed-upon wages or salary but rather in the form of profits (often referred to by economists as the "wages of management.") To determine the "share of labor" in the product of agriculture, for example, one would have not only to find the wages paid farm hands but also to split up the farmers' own incomes into return for their labor and return for their land and capital. That task would involve some hypothetical division of a sum that is really not divisible. One can compute a farmer's "labor income" by supposing that it is the balance of his income left after setting aside the average rate of interest (whatever that may be) upon the value of his investment (if that can be ascertained). Or, one can compute what profits a farmer makes by supposing that the profit is the balance of his income left after setting aside average wages (whatever they may be) for all the work he does (if one can find out how much he works). The first computation as usually carried out shows that the farmer gets very low wages. The second computation usually shows that he makes very small profits. Results equally enlightening might be produced by applying methods equally hypothetical to the incomes of

shopkeepers, repair men, and the many other occupations conducted on a modest scale by men working on their own account.

This task Mr. King has not essayed. But among the facts best known to most business men and easiest to estimate as a whole are the facts concerning the aggregate pay roll, including salaries as well as wages. There is nothing hypothetical about these figures, and their accuracy is subject to a margin of error probably no wider in the majority of cases, and in many cases narrower than the margin of error in the estimate of the net value product of the industry. To the pay roll can be added pensions, compensation for accidents and any other payments made to employees—a figure that is less accurate but of minor size. The sum, to repeat, will not be the "share of labor", but only the share of *hired* labor, received in the form of wages, pensions, and compensation for accidents.

Such figures, cast into the form of percentages of the net value products, are presented in Table 17 for the main industrial groups recognized in the Estimate by Sources of Production.

The striking fact brought out by this table is the marked inequality of the percentages for different industries. The share of hired labor is very low

TABLE 17

PERCENTAGES OF THE NET VALUE PRODUCT OF VARIOUS INDUSTRIES RECEIVED BY EMPLOYEES, IN THE FORM OF PAYMENT FOR SERVICES

1909-1918

NOTE:—These figures show merely the share of *hired* labor of all grades (received as wages, salaries, pensions, compensation for accidents and the like) in the *net value product* of the several industries. The net value product does not include raw materials, supplies or services received from other industries. These figures do *not* show the "share of labor" in industry or in the national income; neither do they show the total incomes of employees, many of whom have other sources of income besides their wages or salaries.

Year	All Industries	Agriculture[1]	Production of Minerals	Manufacturing	
				Factories[2]	Hand Trades[3]
1909	53.0	15.3	71.0	72.2	57.3
1910	52.2	12.5	73.7	71.6	58.9
1911	53.9	14.1	73.8	76.4	58.6
1912	54.9	14.4	71.4	74.5	59.3
1913	55.6	13.4	73.4	74.5	66.7
1914	54.7	12.7	72.7	77.8	58.9
1915	53.6	12.3	67.4	75.4	58.7
1916	51.9	11.7	60.9	68.7	57.8
1917	51.6	10.9	63.1	71.0	61.6
1918	54.0	9.9	70.6	78.1	59.6

	Transportation			Banking	Government[4]	Unclassified Industries
	Railway, Express, Sleeping-Car, Switching and Terminal Companies	Street railway, Electric Light and Power, Telegraph and Telephone Companies	Transportation by Water			
1909	59.6	50.4	83.5	26.6	93.3	60.4
1910	60.3	50.7	75.0	24.3	92.2	61.7
1911	62.8	51.5	81.7	26.5	91.6	61.9
1912	64.2	51.7	77.7	28.6	91.7	62.6
1913	66.4	52.9	79.1	31.6	91.7	63.2
1914	66.3	53.2	85.6	31.9	91.6	63.3
1915	61.5	51.1	79.2	34.5	91.3	62.0
1916	60.9	52.5	72.2	35.5	91.4	56.8
1917	67.4	55.4	79.1	34.8	90.8	52.6
1918	78.2	62.8	83.2	36.7	90.5	52.5

[1] Includes stock raising, market gardening, etc.
[2] Includes lumbering and shipbuilding.
[3] Includes building and construction other than shipbuilding.
[4] Includes schools and government-operated enterprises under state and local as well as national governments.

in agriculture (about one-eighth of the value product on the average) because the farmer and his family do so much of their own work. It is low also

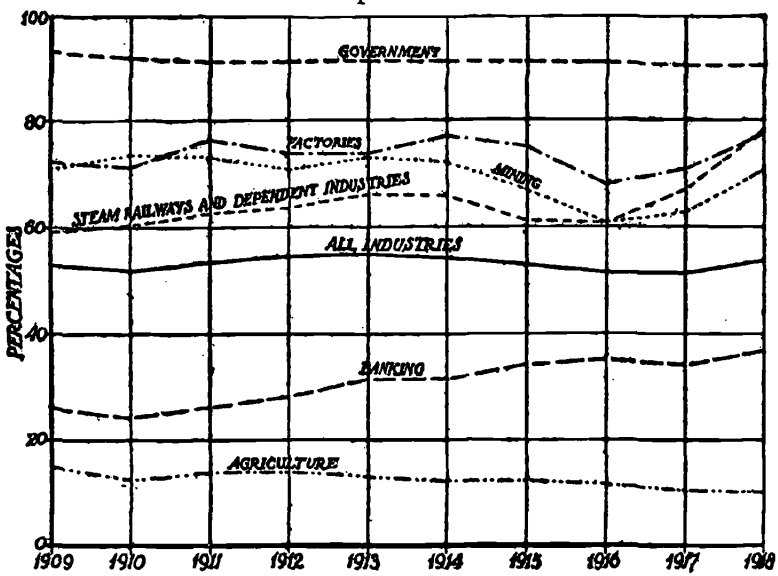
CHART 21.

PERCENTAGES OF THE NET VALUE PRODUCT OF VARIOUS INDUSTRIES RECEIVED BY EMPLOYEES IN THE FORM OF PAYMENT FOR SERVICES.

1909-1918.

NOTE: These percentages show neither the "share of labor" in the value product nor the total income of employees.

Based upon Table 17.



in banking (from a third to a half of the total) for a very different reason. Here most of the labor is hired, but the amount of work required is small in comparison with the capital invested. Then come the hand trades which are a little like farm-

ing in the proportion of labor paid by profits to labor paid by wages, and local public utilities which are somewhat like banking in the proportion of capital invested to labor required. In mining, manufacturing, water transportation, and government work, the percentages oscillate about points not far from three-quarters of the total. For all industries combined, the proportion of the product paid to employees is kept down to slightly more than half of the total by the great importance of farming with its exceptionally low percentage.

Another very interesting set of conclusions may be drawn from the year-to-year changes in these percentages. Except in banking and government work, which present obvious peculiarities, the percentage of the net product going to employees fell between 1914 and 1916 and rose again between 1916 and 1918 (except in farming). The rapid rise of prices in the first period redounded immediately to the benefit of profit-makers. Wages lagged far behind prices in their rise; but they began to rise rapidly and the number of persons employed increased largely after the advance of prices had slowed down. The net result was that, by 1918, the employees in most industries were getting as large a slice of the product as before the war, and in some cases a decidedly larger slice.

Their net gains were particularly noticeable in rail transportation, in local public utilities, in banking and in government work. The percentage for all industries in 1918 stands just a shade higher than in 1909, though not so high as in 1913.

Table 17 shows, then, that a little more than half the total National Income is paid in the form of wages, salaries and the like to hired labor; that this share varies widely from one industry to another with the elaborateness of organization and the amount of capital used per worker; and that in any given industry, the share varies from one year to another with changes in business conditions.

But these conclusions, interesting as they are, raise more questions than they answer. (1) If we take only the highly organized, large-scale industries, in which the net proceeds are most definitely allocated to wages, interest, rent and profits, what share do we find going to hired labor? (2) What part of the total payroll goes to high-salaried officials, and what part to the manual workers and clerical staff? (3) What is the average *per capita* compensation of employees in the different industries and how closely has this compensation followed changes in the cost of living? (4) How important is the addition to their main incomes,

which wage-earners and salaried men get from other sources? Tables 18, 19, 20 and 21 show what light our data throw upon these problems.

The highly organized industries in our list that employ much labor and present satisfactory data for analysis include mining, large-scale manufacturing, and the several branches of land transportation. Roughly speaking, these industries produce a third of the National Income. It is feasible to divide their net value products into two parts, compensation for hired labor, and compensation for management and the use of property. Needless to say, management involves work, and even in these highly organized industries, this work is paid for in part by profits. It should also be noted that the available data come from "going concerns". Losses which such concerns suffer presumably are deducted from profits. But the losses of enterprises that go into bankruptcy or "fail to succeed" in any year are not likely to be reported in our sources, and such losses fall mainly, though not exclusively, upon "management and property". We do not know how large such losses are, but they probably make an appreciable offset to the income received by active business men and investors.

Even with these qualifications, the figures in

Table 18 are highly significant. The share of the net value product paid in wages, salaries, pensions and the like varies from two-thirds to a little more than three-quarters. Conversely "management and property" receive from a third to less than a quarter of the net proceeds. These variations in the respective shares are due mainly to changes in business conditions, and during the war were probably more violent than usual. Both the high percentage that went to "management and property" in 1916 and the high percentage that went to hired labor in 1918 might prove to be outside the usual limits of fluctuation if we had data of this sort for a long series of "normal" years.

TABLE 18

DIVISION OF COMBINED NET VALUE PRODUCT OF MINES, FACTORIES, AND LAND TRANSPORTATION BETWEEN EARNINGS OF EMPLOYEES AND RETURNS FOR MANAGEMENT AND THE USE OF PROPERTY

1909-1918

Note:—"Wages and salaries" includes all pensions, compensation for accidents, and the like. "Management and property" includes rentals, royalties, interest, and dividends. "Net value product" does not include raw materials, supplies, and services received from other industries.

Year	Millions of Dollars		Per Cent.	
	Wages and Salaries	Management and Property	Wages and Salaries	Management and Property
1909	$6,481	$2,950	68.7	31.3
1910	7,156	3,250	68.8	31.2
1911	7,287	2,791	72.3	27.7
1912	7,993	3,169	71.6	28.4
1913	8,651	3,359	72.0	28.0
1914	7,947	2,816	73.8	26.2
1915	8,722	3,470	71.5	28.5
1916	11,630	5,810	66.7	33.3
1917	14,375	6,502	68.9	31.1
1918	17,472	5,124	77.3	22.7

The division of the total payments for hired labor between the salaries of officials and the vast army of manual and clerical workers can be effected very roughly for this same group of highly organized industries. Table 19 gives the best figures of this sort which Mr. King has been able to compile. The results confirm and make more precise two generally accepted opinions, (1) that the salaries of officials do not bulk large in the total payroll, and (2) that salaries are distinctly more stable than wages. The indications are that in highly organized enterprises, salaries absorb not much more than 7 or 8 per cent. of the payroll, and not more than 5 or 6 per cent. of the net value product. In prosperous times, they increase less rapidly than wages, but fall little if at all in hard times. Indeed, if our data are representative, salaries actually increased somewhat in the face of the depression of 1914. The net increase from 1909 to 1918 was 145 per cent. in salaries of officials as against 172 per cent. in wages of manual and clerical employees.

Concerning the average annual earnings of wage and salary earners and the fluctuations in the purchasing power of their incomes, Mr. King has been able to collect data which cover substantially the whole field of industry, though not in

TABLE 19

A ROUGH COMPARISON OF THE SALARIES OF OFFICIALS, THE PAY OF MANUAL AND CLERICAL EMPLOYEES, AND THE NET VALUE PRODUCT, OF MINES, FACTORIES, AND LAND TRANSPORTATION

1909-1918

NOTE:—"Wages and Salaries" include pensions, compensation for accidents, and the like. The net value product does not include raw materials, supplies, or services received from other industries.

Year	Total Net Value Product of the Given Industries	Total Wages and Salaries	Salaries of Officials	Pay of Manual and Clerical Employees	Percentage of Net Value Product Paid as			Percentage of Total Wages and Salaries Paid as	
					Total Wages and Salaries	Salaries of Officials	Pay of Manual and Clerical Employees	Salaries of Officials	Pay of Manual and Clerical Employees
	Millions of Dollars								
1909	$ 9,568	$ 6,521	$ 504	$ 6,017	68.2	5.3	62.9	7.7	92.3
1910	10,505	7,164	541	6,623	68.2	5.2	63.0	7.6	92.4
1911	10,186	7,290	578	6,712	71.6	5.7	65.9	7.9	92.1
1912	11,296	7,979	617	7,362	70.7	5.5	65.2	7.7	92.3
1913	12,244	8,754	656	8,098	71.5	5.4	66.1	7.5	92.5
1914	10,937	8,009	691	7,318	73.2	6.3	66.9	8.6	91.4
1915	12,162	8,556	723	7,833	70.3	5.9	64.4	8.5	91.5
1916	17,593	11,599	846	10,753	65.9	4.8	61.1	7.3	92.7
1917	20,928	14,441	1,015	13,426	69.0	4.9	64.1	7.0	93.0
1918	22,757	17,471	1,235	16,236	76.8	5.4	71.4	7.1	92.9

sufficient detail to permit of refined analysis. His results are summarized in Table 20.

The top section of this table shows the average money earnings each year of all employees who normally make their living by working in the specified industries. Since the people "attached to an industry" are never all at work, average earnings are somewhat lower than would be the earnings of an employee of average ability, who was able to work full-time throughout the year. Average actual earnings are affected not only by "unemployment" in the usual sense of that term, but also by loss of time through sickness, voluntary periods of rest, and seasonal shiftings from one kind of work to another. In agriculture, particularly, the average employee has a short working season so that yearly earnings of most "farm hands" are meager even when they are getting good wages by the day or month. The figures in the table do not show changes in wage rates or in "the price of labor", but something more significant—namely, the average earnings that the employees in different industries have realized each year under the conditions of pay, employment, and health that actually obtained.

More significant still is the middle section of the table in which the purchasing power of money

earnings is expressed in terms of 1913 prices. These figures were made by applying the Bureau of Labor Statistics index number of "the cost of living" on the 1913 base, to the money earnings of each year. According to these figures, the economic condition of the average employee improved in all the industries covered from 1909 to 1913, though the improvement was slight in the hand trades, water transportation, agriculture, and the "unclassified industries". The grand average shows a gain of 10.6 per cent. in purchasing power in these four years. From 1913 to 1918, on the contrary, the grand average undergoes wide fluctuations, caused by the violent changes in wage rates and living expenses, the net effect of which was a decline of about 5 per cent. of the purchasing power enjoyed in 1913. This decline, however, was confined to four industries—government, whose enlistment of millions of soldiers brought down the average compensation sharply in 1918; public utilities which suffered to a peculiar degree from inability to raise their selling prices and which largely increased the proportion of their female employees; the unclassified industries; and banking, in which salaries did not advance so steadily as the cost of living. On the other hand, notable gains were scored by em-

ployees of mines, factories, railways, and water-transportation companies. All these fluctuations are reduced to a comparable base by the "indices of the purchasing power of annual earnings" in the third section of the table.

TABLE

THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES 1909-

Denominator of Earnings	Calendar Year	All Industries [1]	Agriculture [2]	Production of Minerals [2]	Manufacturing Factories [2]	Manufacturing Hand Trades [3]
Current Money	1909	$626	$302	$599	$571	$699
	1910	656	301	642	620	681
	1911	648	317	647	609	657
	1912	692	319	687	655	714
	1913	723	328	755	705	748
	1914	674	321	649	616	640
	1915	697	330	656	653	693
	1916	831	357	814	873	840
	1917	961	463	1,025	1,022	945
	1918	1,078	590	1,283	1,148	1,194
Value at Prices of 1913	1909	$656	$316	$627	$597	$732
	1910	671	308	656	634	696
	1911	659	322	658	619	667
	1912	696	321	691	659	719
	1913	723	328	755	705	748
	1914	668	317	643	610	634
	1915	677	320	637	634	673
	1916	755	325	740	794	763
	1917	745	359	795	792	732
	1918	682	378	812	726	756
Indices of the Purchasing Power of Annual Earnings. Base, 1913	1909	90.7	96.3	83.0	84.7	97.9
	1910	92.8	93.9	86.9	89.9	93.0
	1911	91.1	98.2	87.1	87.8	89.2
	1912	96.3	97.9	91.5	93.5	96.1
	1913	100.0	100.0	100.0	100.0	100.0
	1914	92.4	96.6	85.2	86.5	84.8
	1915	93.6	97.6	84.4	89.9	90.0
	1916	104.4	99.1	98.0	112.6	102.0
	1917	103.0	109.5	105.3	112.3	97.9
	1918	94.3	113.7	107.5	103.0	101.1

[1] Includes amounts paid for pensions and compensation for injuries.
[2] Includes payments for work done by contract.
[3] Includes subsistence but excludes pensions.

Finally, how much income do employees receive from other sources than their wages, salaries, pensions and the like? Definite data on this head are scarce, though everyone knows that many wage and salary earners eke out their living by small

20

NORMALLY ENGAGED IN VARIOUS INDUSTRIES

1918

All Transportation [1]	Transportation: Railway [1] Express, Pullman, Switching and Terminal Cos.	Transportation: Street Railway,[1] Electric Light and Power, Telegraph and Telephone Cos.	Transportation by Water [1]	Banking	Government [2]	Unclassified Industries
$657	$651	$623	$773	$770	$739	$716
688	690	638	788	797	763	743
697	705	641	773	843	778	715
731	747	652	808	887	798	772
762	782	678	825	930	823	779
721	723	683	807	921	842	768
727	728	666	880	1,017	861	777
842	849	732	1,081	1,170	891	867
1,017	1,063	790	1,306	1,238	940	972
1,286	1,394	878	1,590	1,461	895	1,054
$688	$682	$658	$810	$807	$774	$750
703	705	653	806	815	780	759
709	716	652	785	857	791	727
736	751	656	813	892	803	777
762	782	678	825	930	823	779
714	716	676	799	912	833	760
706	707	647	854	987	836	755
765	772	665	983	1,064	810	788
789	824	613	1,012	959	729	753
814	882	556	1,006	925	567	667
90.3	87.2	96.3	98.2	86.8	94.0	96.3
92.3	90.2	96.3	97.7	87.6	94.8	97.4
93.0	91.6	96.2	95.2	92.2	96.1	93.3
96.6	96.0	96.8	98.5	95.9	97.6	99.7
100.0	100.0	100.0	100.0	100.0	100.0	100.0
93.7	91.6	99.7	96.8	98.1	101.2	97.6
92.7	90.4	95.4	103.5	106.1	101.6	96.9
100.4	98.7	98.1	119.2	114.4	98.4	101.2
103.5	105.4	90.4	122.7	103.1	88.6	96.7
106.8	112.8	82.0	121.9	99.5	68.9	85.6

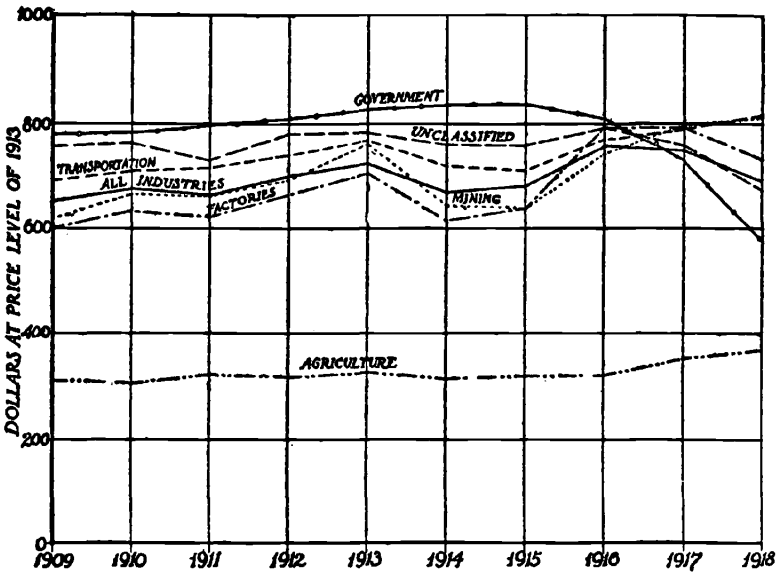
business ventures, taking boarders or lodgers, raising poultry, cultivating gardens, or keeping cows, and that many salaried men have substan-

CHART 22.

THE PURCHASING POWER AT THE PRICE LEVEL OF 1913 OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN VARIOUS INDUSTRIES.

1909-1918.

Based upon Table 20.



tial incomes from investments of one kind or another.

A study of 1602 school teachers, made by a Committee on Teachers' Salaries, indicated an income from investments of 6 per cent. of the total income. A similar study of 12,096 families by the

Bureau of Labor Statistics, showed from 4 to 5 per cent. of the total income as coming from investments, but these families were selected so as to exclude those having a large percentage from

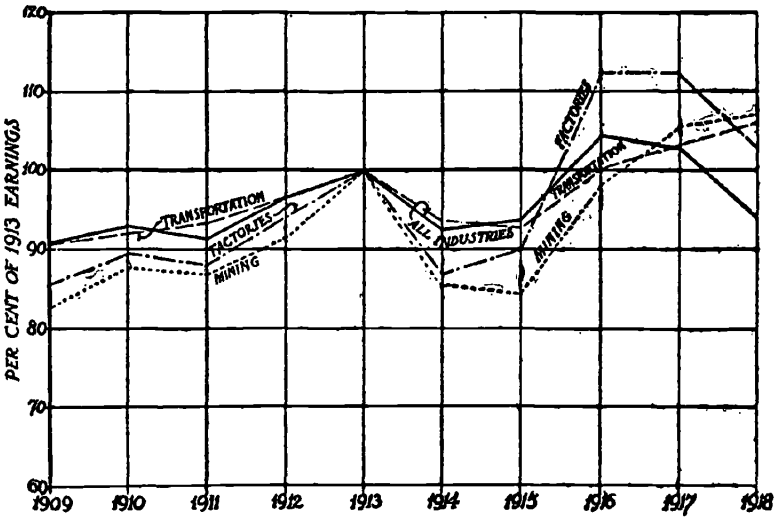
CHART 23.

RELATIVE FLUCTUATIONS IN THE PURCHASING POWER AT THE PRICE LEVEL OF 1913, OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN MINING, MANUFACTURING, TRANSPORTATION, AND ALL INDUSTRIES.

1909-1918.

Annual earnings in 1913 = 100.

Based upon Table 20.



these sources. Chapin's study indicated that the New York working class received about 6 per cent. of their total income from sources other than earnings. An investigation by the United States Public

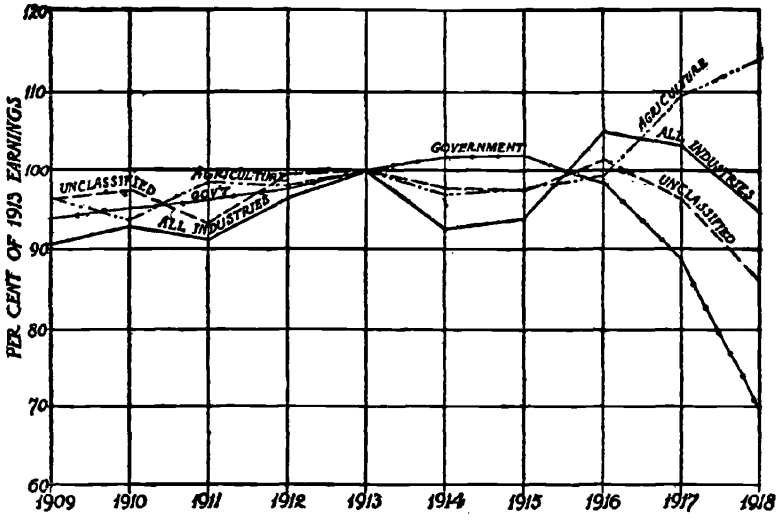
Health Service in South Carolina showed that in 1917 families of cotton mill workers derived about 12 per cent. of their income from miscellaneous sources. The higher percentage in South Caro-

CHART 24.

RELATIVE FLUCTUATIONS IN THE PURCHASING POWER AT THE PRICE LEVEL OF 1913, OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN AGRICULTURE, GOVERNMENT, UNCLASSIFIED, AND ALL INDUSTRIES.

Annual earnings in 1913 = 100.

Based upon Table 20.



lina is probably due to the fact that these mill workers live for the most part in villages where it is easy to raise gardens and keep cows, while the New York employees have few such opportunities. If ordinary salaried em-

ployees are included with the wage earners, it appears likely that 8 per cent. is not too high an allowance for income from sources other than earnings. That the higher salaried classes receive a much larger proportion of their income from investments seems highly probable.

If an estimate is to be made, then, of the supplemental incomes of wage and salary earners, it is desirable to break this class up into at least three sections. The *Statistics of Income,* published by the Bureau of Internal Revenue, makes possible a division of this sort. Before 1916, however, no figures are available. Since the material is so fragmentary, it seems best to present only

TABLE 21

A ROUGH ESTIMATE FOR 1918 OF THE INCOME FROM ALL SOURCES OF SALARY AND WAGE WORKERS

	Millions of Dollars	Per Cent. of Total National Pay Roll	Per Cent. of Total National Income
Total Compensation for Services of Employees having Incomes of			
Less than $5,000	$30,472	93.6	
$5,000 to $20,000 [4]	1,378	4.2	
Over $20,000 [4]	725	2.2	
All Classes	$32,575	100.0	
Total Income of Employees having Incomes of			
Less than $5,000 [1]	$32,910		54.5
$5,000 to $20,000 [2]	1,585		2.6
Over $20,000 [3]	942		1.6
All Classes	$35,437		58.7
Total Income of Non-Employees	$24,929		41.3
Total Income of the Entire Population	$60,366		100.0

[1] Estimated at 1.08 times the total earnings.
[2] Estimated at 1.15 times the total earnings.
[3] Estimated at 1.30 times the total earnings.
[4] *Statistics of Income,* 1918, p. 44.

the division among the different classes as it existed in 1918. The probabilities are that the division in the other years was somewhat similar if allowance is made for variations in the purchasing power of money.

This estimate of the incidental income of the employed classes is, of course, based upon an extremely limited foundation, but it is believed, nevertheless, that even the crude figures presented are accurate enough to show in a very rough way the general magnitude of the quantities involved. Employees probably received in 1918, some three billions of dollars in addition to their wages and salaries—a sum representing approximately a twentieth of the National Income.

II. PERSONAL INCOMES ABOVE AND BELOW $2,000 PER YEAR

Since 1917, the income-tax law has required all single persons having incomes of over $1,000 a year and all married persons having, separately or jointly, incomes exceeding $2,000 a year to make returns to the Bureau of Internal Revenue. That provision of the law was responsible for two of the major sections of the Estimate by Incomes Received. One of these sections is based primar-

ily upon the income-tax data, supplemented by estimates of the amount of under-reporting and non-reporting of taxable incomes. The second section, dealing with incomes below the exemption limit, is made from census data concerning the number of persons following gainful occupations (after subtraction of the numbers included in the first section), and from estimates of the average incomes of persons in these occupations. Thus, the $2,000 line necessarily plays a prominent rôle in this estimate. And that division is a fortunate one, for the $2,000 line serves as well as any arbitrary line could to divide families enjoying at least modest comfort from families that can scarcely be called well-to-do. Hence Mr. Knauth has carried this line of division through those sections of the Estimate by Incomes Received, which do not of themselves break in two at $2,000 —the sections dealing with farmers and with tax-exempt income. Further, he has rearranged his data for 1913-1916, when the family exemption limit was $3,000, on the $2,000 basis, and extended that distinction back to 1910-1912, when there was no income tax.

In presenting the results of this work, corporate surplus is temporarily disregarded as an item of National Income. Reasons have already been

given for believing that, during the years of high income-tax rates at least, no great amount of this income has been "realized" by stockholders.[1] And no small part of these accumulated surpluses was probably lost in the readjustments of 1919 and the business depression of 1920-21 before the time came when they could be "realized" to advantage. If the method of treating this item adopted here introduces serious inaccuracy into the figures, it doubtless reduces the amount of income assigned to the over-$2,000 class much more than it reduces the amount in the lower class.

Drawing the $2,000 line through farmers' incomes is a particularly delicate task. Several studies of the distribution of farmers' incomes have been made by experts in this field, so that Mr. Knauth has a statistical basis for his conclusions. But the statistical basis is narrow, and the application of ratios computed from a few hundred returns, no matter how carefully treated, to all the farmers in the country may involve an error that is considerable. Hence the general results of the inquiry will be presented for all incomes, for all except farmers' incomes, and for farmers' incomes by themselves.

One final warning: The following figures for

[1] See above, Chapter II, Section IV, pp. 43-45.

incomes over $2,000 are not made on the same basis as the income-tax returns and are not comparable with them. Not only does the Estimate by Incomes Received include income that evades the tax, but it also includes income that is not subject to taxation, the large items of their own produce consumed by farmers' families, the rental value of homes occupied by their owners, interest on tax-exempt bonds, and the minor item of salaries paid to state officials. In particular, the number of farmers legally subject to income tax is very much smaller than an incautious reader might infer from these figures.

Table 22 and the charts based upon it tell their own story. About the main facts of that story, there can be little doubt, though the details may be inaccurate. Certainly among the men, women and children gainfully employed in 1910, only a small fraction, perhaps as the table says one in twenty-five had an annual income exceeding $2,000. Certainly this ratio increased with the war-time rise of prices, perhaps it became one and a half persons out of every ten. Necessarily a much larger fraction of the total *income* than of income receivers belong above the $2,000 line—the table says a third of the income in 1910. Certainly, this fraction grew somewhat larger during the war, not

merely because events pushed millions of small incomes above the $2,000 line (a condition particularly characteristic of 1918 and 1919) but also because events for a time favored the increase in

TABLE 22

PERSONAL INCOMES ABOVE AND BELOW $2,000 PER ANNUM

1910-1919

ALL INCOME RECEIVERS

Year	ACTUAL AMOUNTS				RELATIVE AMOUNTS			
	No. of Persons		Amount of Income		No. of Persons		Amount of Income	
	Income less than $2,000	Income more than $2,000	Income less than $2,000	Income more than $2,000	Income less than $2,000	Income more than $2,000	Income less than $2,000	Income more than $2,000
	Thousand persons		Billion dollars		Per cent.		Per cent.	
1910	34,352	1,411	$20.0	$9.9	96.	4.	67.	33.
1911	34,693	1,379	20.7	9.6	96.	4.	68.	32.
1912	34,969	1,411	21.6	9.9	96.	4.	69.	31.
1913	35,345	1,443	22.2	10.1	96.	4.	69.	31.
1914	35,752	1,444	22.2	9.8	96.	4.	69.	31.
1915	35,597	2,008	22.9	11.4	95.	5.	67.	33.
1916	35,366	2,748	26.0	15.6	93.	7.	62.	38.
1917	34,160	4,363	29.6	20.9	89.	11.	59.	41.
1918	35,021	5,291	36.8	23.2	87.	13.	61.	39.
1919	34,233	5,508	39.5	25.2	86.	14.	61.	39.
	ALL INCOME RECEIVERS EXCEPT FARMERS							
1910	28,100	1,300	$16.3	$9.6	96.	4.	63.	37.
1911	28,400	1,300	17.2	9.4	96.	4.	65.	35.
1912	28,700	1,300	17.9	9.6	96.	4.	65.	35.
1913	29,100	1,300	18.3	9.8	96.	4.	65.	35.
1914	29,500	1,300	18.3	9.5	96.	4.	66.	34.
1915	29,400	1,800	18.7	10.9	94.	6.	63.	37.
1916	29,400	2,300	21.4	14.4	93.	7.	60.	40.
1917	29,050	3,000	24.7	17.0	91.	9.	59.	41.
1918	30,450	3,400	32.1	17.4	90.	10.	64.	36.
1919	29,800	3,500	34.9	18.9	89.	11.	65.	35.
	FARMERS							
1910	6,252	111	$3.7	$ .3	98.	2.	93.	7.
1911	6,293	79	3.5	.2	99.	1.	95.	5.
1912	6,269	111	3.7	.3	98.	2.	93.	7.
1913	6,245	143	3.9	.3	98.	2.	93.	7.
1914	6,252	144	3.9	.3	98.	2.	93.	7.
1915	6,197	208	4.2	.5	97.	3.	89.	11.
1916	5,966	448	4.6	1.2	93.	7.	79.	21.
1917	5,110	1,313	4.9	3.9	80.	20.	56.	44.
1918	4,571	1,861	4.7	5.8	71.	29.	45.	55.
1919	4,433	2,008	4.6	6.3	69.	31.	42.	58.

size of incomes already large (a condition particularly characteristic of 1916 and 1917).

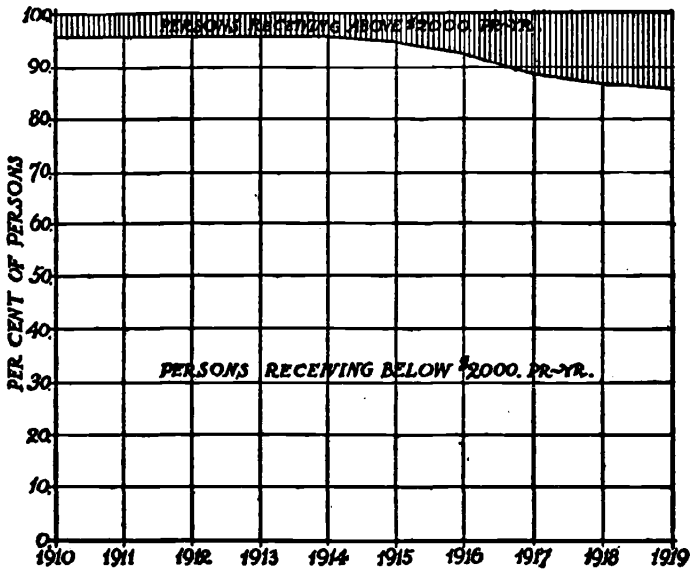
This use of a fixed sum of money in studying the distribution of income has its advantages; but

CHART 25.

PERCENTAGES OF PERSONS RECEIVING INCOMES ABOVE AND BELOW $2,000 PER ANNUM.

1910-1919.

Based upon Table 22.



it may be misleading if it stands alone. For, from the viewpoint of economic welfare, a fixed money income was a rapidly changing quantity during the war. The division of income receivers by the $2,000 line in 1919 is very far from meaning what that division meant in 1913. Some point between

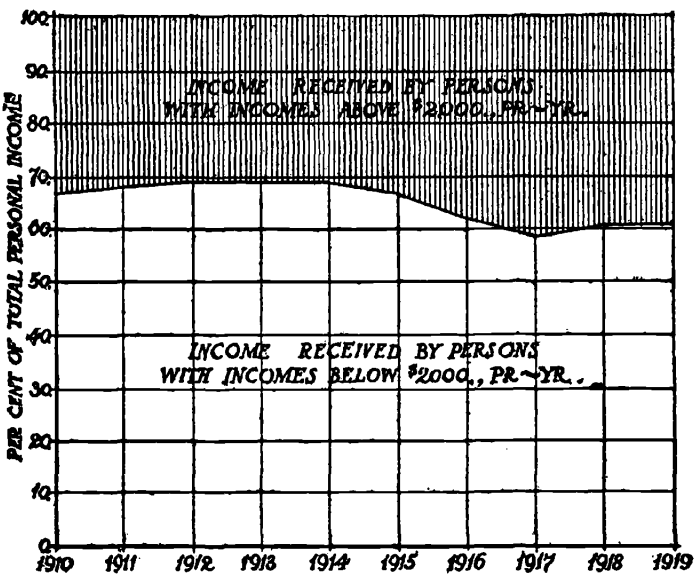
$3,000 and $4,000 a year in the later year would be needed to give results comparable in economic significance with the pre-war division at $2,000. But the data are not in such shape that we can

CHART 26.

PERCENTAGES OF TOTAL PERSONAL INCOME RECEIVED BY PERSONS WITH INCOMES ABOVE AND BELOW $2,000 PER ANNUM.

1910-1919.

Based upon Table 22.



draw dividing lines through the whole body of income receivers at any point we like in successive years.

Another approach to the problem, however, which supplements the preceding results in an

interesting way, is feasible. We can estimate in each year for which we have income-tax statistics —estimate very roughly—the amount of income received by the highest 5 per cent. of the persons having incomes. Studies made by the Internal Revenue Bureau show that the individuals included within any such group change much from year to year; but that fact is not disturbing. Nor is 5 per cent. of the income receivers a group limited to the wealthy; for, to include the highest 5 per cent. of all income receivers, we have to take in all incomes above $2,000 in 1913 and 1914, above $2,100 in 1915, above $2,600 in 1916, above $2,900 in 1917, above $3,300 in 1918, and above $3,400 in 1919. The conjectural element in the estimate arises from the difficulty of allocating non-taxable income among different income classes, of making proper allowances for underreporting and non-reporting of incomes, and particularly of distributing the farmers along the income scale. This last difficulty is especially serious, so that we give the results in two forms, first including and then excluding the farmers.

What the results indicate is that about a third of the National Income went to the most prosperous twentieth of the income receivers in 1913 to 1916. But after 1916 the money incomes of this

class increased less rapidly than did those of the other nineteen-twentieths, so that the share of the total received by the most prosperous 5 per cent. dropped in 1919 to about a quarter of the total. From this point of view, also, the evidence indicates that the inequality in the distribution of income declined somewhat during the war.

TABLE 23

A CONJECTURAL ESTIMATE OF THE PERCENTAGE OF THE NATIONAL INCOME RECEIVED BY THE HIGHEST FIVE PER CENT. OF INCOME RECEIVERS

1913-1919

Year	Income of the Highest 5% of Income Receivers (Billion Dollars)	Total Individual Income (excluding Corporate Surplus) (Billion Dollars)	Per Cent. of Total Income Received by Highest 5% of Income Receivers
Including Farmers			
1913	$10.6	$32.3	33
1914	10.3	32.0	32
1915	11.1	34.3	32
1916	14.3	41.6	34
1917	14.7	50.5	29
1918	15.4	60.0	26
1919	15.5	64.7	24
Excluding Farmers			
1913	$ 9.9	$28.1	35
1914	9.6	27.8	34
1915	10.4	29.6	35
1916	12.8	35.8	36
1917	13.6	41.7	32
1918	13.9	49.5	28
1919	14.4	53.8	27

III. THE DISTRIBUTION OF INCOME AMONG INDIVIDUALS

The standard method of showing how incomes are distributed among individuals is to use "fre-

quency tables." The following table, taken from the official *Statistics of Income* for 1918 is a good example of this device.

TABLE 24

THE DISTRIBUTION OF PERSONAL INCOMES BY INCOME CLASSES AS SHOWN BY THE OFFICIAL COMPILATION FOR THE CALENDAR YEAR 1918

Income Classes	Number of Returns	Amount of Incomes (Millions of Dollars)	Percentage Number of Returns	Percentage Amount of Income
$ 1,000- $ 2,000	1,516,938	$2,232	34.28	14.02
2,000- 3,000	1,495,878	3,627	33.83	22.78
3,000- 5,000	932,336	3,535	21.06	22.20
5,000- 10,000	319,356	2,146	7.22	13.47
10,000- 25,000	116,569	1,737	2.68	10.90
25,000- 50,000	28,542	978	.65	6.14
50,000- 100,000	9,996	680	.23	4.27
100,000- 150,000	2,358	284	.05	1.78
150,000- 300,000	1,514	305	.035	1.92
300,000- 500,000	382	145	.009	.91
500,000-1,000,000	178	119	.004	.75
1,000,000 and over	67	137	.002	.86
	4,425,114	$15,925	100.000	100.00

Such tables show certain features of the distribution of income admirably, but they do not give a clear picture of many peculiarities of the distribution as a whole. To show the facts all at once in their relations to each other it is desirable to use graphic methods.

But ordinary charts drawn on an arithmetic or *natural* scale do not serve the purpose. For example, if incomes be plotted along a horizontal line with one-tenth of an inch for each thousand dollars, the chart becomes unmanageably long—42 feet of paper are required to reach $5,000,000, and one income larger than that was reported in 1918.

Even that size is too small when the distribution of all incomes is to be presented; for below the $1,000 line differences of income at least as small as $100 per year become highly important. To make such intervals easily visible and keep the scale uniform so as not to distort the picture, over 400 feet of paper would be needed. Even more impractical demands for space are made by the vertical scale showing number of persons. Nor can the difficulty be met by breaking the problem into parts and drawing the several sections of the curve on different scales. For these sections with their dissimilar scales will not fuse into the single picture that is wanted. And taken singly no one of the sections can give an illuminating impression of the curve as a whole.

A more illuminating device than the natural-scale chart was used about 1896 by Vilfredo Pareto, when he plotted income-tax data on logarithmic paper, such as engineers use for many purposes. The logarithmic scale (which assigns equal spaces to each step in such a series as 100, 200, 400, 800, 1600, etc.) makes it possible to plot both the small and the large incomes and the small and large number of income receivers on a single sheet of paper and to do it in such a way

that the characteristic features of both ends of the curve may be observed.

Pareto, indeed, made large claims for the results attained by his use of the double logarithmic scale. He held that income-data distributions when plotted in this way give curves that closely approximate straight lines. Further, he held that income-tax figures from different countries and from different times, even data like house-rentals that presumably vary with incomes, all closely approximate straight lines having nearly uniform slopes. In the first flush of his enthusiasm he even implied that his investigations indicated the impossibility of altering substantially the proportions in which income is distributed among individuals—the type of this distribution in all countries at all stages of social development seemed to be immutable.

Charts 27 and 28 illustrate Pareto's device[1] and show roughly in what degree the American income-tax returns for 1913 to 1918 conform to his "straight-line law". Anyone accustomed to use only charts drawn on a natural scale may be inclined to say that the conformity is close. But

[1] Pareto charted "cumulative" data while we are charting non-cumulative data. However, it may be mathematically proven that if the cumulative distribution be a straight line on the double logarithmic scale, the non-cumulative distribution will also be a straight line on that scale.

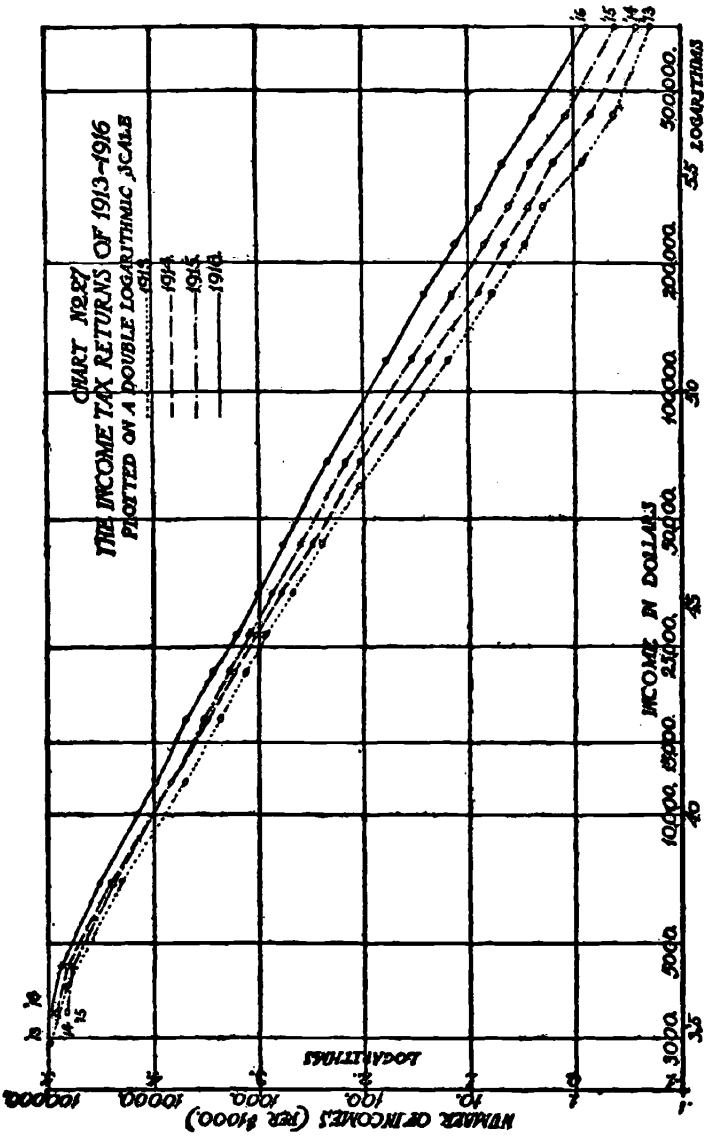


CHART №27
THE INCOME TAX RETURNS OF 1913-1916
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
1913
1914
1915
1916
INCOME IN DOLLARS
LOGARITHMS
NUMBER OF INCOMES (PER $1000.)
LOGARITHMS

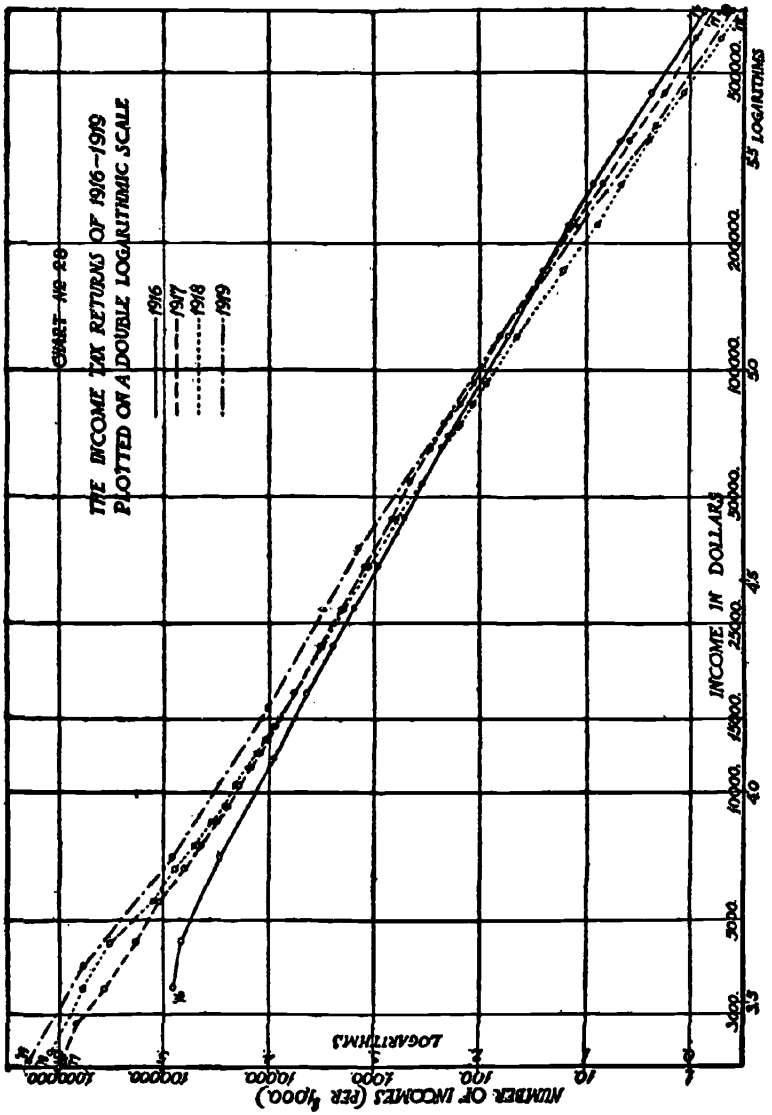


CHART No 29
THE INCOME TAX RETURNS OF 1916-1919
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
1916
1917
1918
1919
INCOME IN DOLLARS
LOGARITHMS
NUMBER OF INCOMES (PER 1,000)
LOGARITHMS

the ratio treatment involved in the double logarithmic scale does so much compressing of the data, both for the incomes of large size and for the large numbers of income receivers, that in using it a very different standard of conformity should be set than is appropriate in interpreting natural-scale charts. And when one does look thus closely at the curves and especially when one actually tests their conformity to a straight line, one finds that the conformity is somewhat specious. (1) The lines are not straight. They show "bumps" and "hollows",—especially the most reliable of the set—that for 1918. Even if such surface irregularities be set aside as capable of being "smoothed out", the lines have slight but significant curvatures throughout their whole course. (2) The slope of the lines is not uniform. Nor can this lack of uniformity be attributed merely to the increase of population and the rise of prices, for such factors would simply shift the position of the curve as a whole without altering its form. Quite the contrary, the changes in slope suggest that changes in business conditions from one year to the next modified the distributions of income among people of large and of small means. In 1914-16 the slope grew less each year[1] with the

[1] The income tax figures for 1916 are not strictly comparable

increase of business activity and the enormous enhancement of profits. In 1916-18, on the contrary, the slope grew steeper again as the increase of wages and salaries raised the smaller incomes and encroached upon profits. In 1919 the slope grew less again.[1]

Another most serious defect of "Pareto's Law", as Professor Pareto himself saw, is that it cannot be extended to include incomes below the tax-exemption limit. The extension of the logarithmic straight line involves the absurdity of an infinite number of persons having incomes just above zero. We have excellent reason to believe on the contrary that at some income-interval below the tax-exemption limit, but well above zero, there is a maximum number of incomes, and that once past this interval the numbers of incomes in successive intervals decline indefinitely.

Considerations such as these have led Mr. Ma-

with those for the other years. In 1916 a husband and wife making separate returns were tabulated as one person.

The fact that the figures for 1913 report income for only ten months, while it lowers the log line, does not alter its slope.

[1] Professor A. L. Bowley, *Report from the Select Committee on Income Tax,* 1906, pp. 81 and 227, and Professor A. C. Pigou, *Economics of Welfare,* p. 695, have followed the lead of Pareto, *Cours d'économie politique,* p. 312, in curiously misinterpreting this matter of slope. The *steeper* the line (whether on a cumulative or non-cumulative basis), the less is the inequality of income. If all persons had the same income the distribution would be represented by a perpendicular line.

The slopes are all technically *negative* but the sense in which we have used the terms *greater* and *less* in the text is obvious.

caulay, who had charge of this part of the Bureau's investigation, to put aside "Pareto's Law" as having at the present time little more than historical interest. But he has kept the double logarithmic chart as a powerful instrument to be used in conjunction with other analytic devices in studying the nature of the distribution of incomes. His task was to construct a curve which would represent the best approximation to the facts of income-distribution that can be made by adjusting the available data in conformity with current statistical principles.

The materials which Mr. Macaulay had to use and the considerations which he had to keep in mind may be listed.

1. The income-tax data for 1918, the year for which the most complete returns were available, show the incomes of less than 3,000,000 out of more than 40,000,000 persons who had money incomes according to the census.[1] Further, these data had to be adjusted to include (1) the large number of persons, especially farmers and small business men, who failed to make any tax return whatever, (2) evasion by reporting persons, (3) non-monetary income, especially farm and garden

[1] The income-tax returns for the $1,000-$2,000 class are of but little use, because they do not include married people living together.

produce consumed by their producers and the rental value of homes occupied by their owners, (4) income from tax-exempt securities, etc. Mr. Knauth had estimated the magnitude of these factors; Mr. Macaulay had to distribute these amounts along the income curve in the most probable manner.

2. Mr. Knauth's division of the Estimate by Incomes Received into incomes of less and incomes of more than $2,000 was of help to Mr. Macaulay, though in the final adjustment of his curve to fit all the conditions that must be met he arrived at results slightly different from Mr. Knauth's on this point.

3. To distribute the incomes of less than $2,000 Mr. Macaulay had to combine the results of many scattered pieces of evidence. His largest and most important groups of material consisted of data showing the distribution of the wages of employees in manufacturing industries, in telephone and telegraph companies, in several branches of transportation and the salaries of federal employees in the civil service. He also used the small samples available showing the distribution of the incomes of farmers. The curve for each of these groups was based upon the available collections of data, weighting most heavily

those collections which seemed most valuable as indices of the distribution of the particular type of income under consideration. While some of these collections of data included hundreds of thousands of persons, the total number represented forms only a very small fraction of the millions of income receivers who had to be distributed, and only in the case of farmers and civil service employees did the data profess to show annual incomes. Further, it was necessary to add estimates of income from other sources to the income from wages, salaries, and farm profits which the data showed.

4. In every year many men in business lose money. The Estimates of the National Income by Sources of Production and by Incomes Received are made on a net basis, so far as possible. That is, negative income, so far as known, is deducted from positive income in computing the total. Mr. Macaulay had to estimate the number and aggregate amount of negative incomes before he could distribute the number and amount of positive incomes. For these estimates his materials were especially scanty.

5. Statistical experience in dealing with frequency curves representing vast bodies of data justified "smoothing" the curve. There is a

strong a priori probability that the income-curve has a single "mode" or apex, and that it has not many "bumps," or "rolls"[1] when charted on a double logarithmic scale. This a priori expectation is supported by the largest and best accredited collections of data that Mr. Macaulay found, such as the income tax figures, the great official investigations into wage rates, and (making allowance for the smallness of the sample) Mr. Arthur T. Emery's very careful investigation into the total incomes of 2,000 Chicago households. Such collections of data were also suggestive and enlightening as to many peculiarities which might be expected in the shape of the final income curve.

The final distribution, of which a part charted on the natural scale is shown by Chart 29 and a much larger part charted on a double logarithmic scale is shown by Chart 30, was built up by an elaborate series of adjustments to fit as well as might be all these considerations. The resulting curve is strictly empirical. It is fitted to adjusted data and is not a mathematical construction except through a very small part of its range. How ac-

[1] That is, the curve has not numerous "points of inflexion" when charted on a double logarithmic scale. The above statement and the statement concerning "smoothness" must not be interpreted as meaning that the income distribution is statistically homogeneous or can be adequately described by any mathematical equation suitable to describing distributions of homogeneous data.

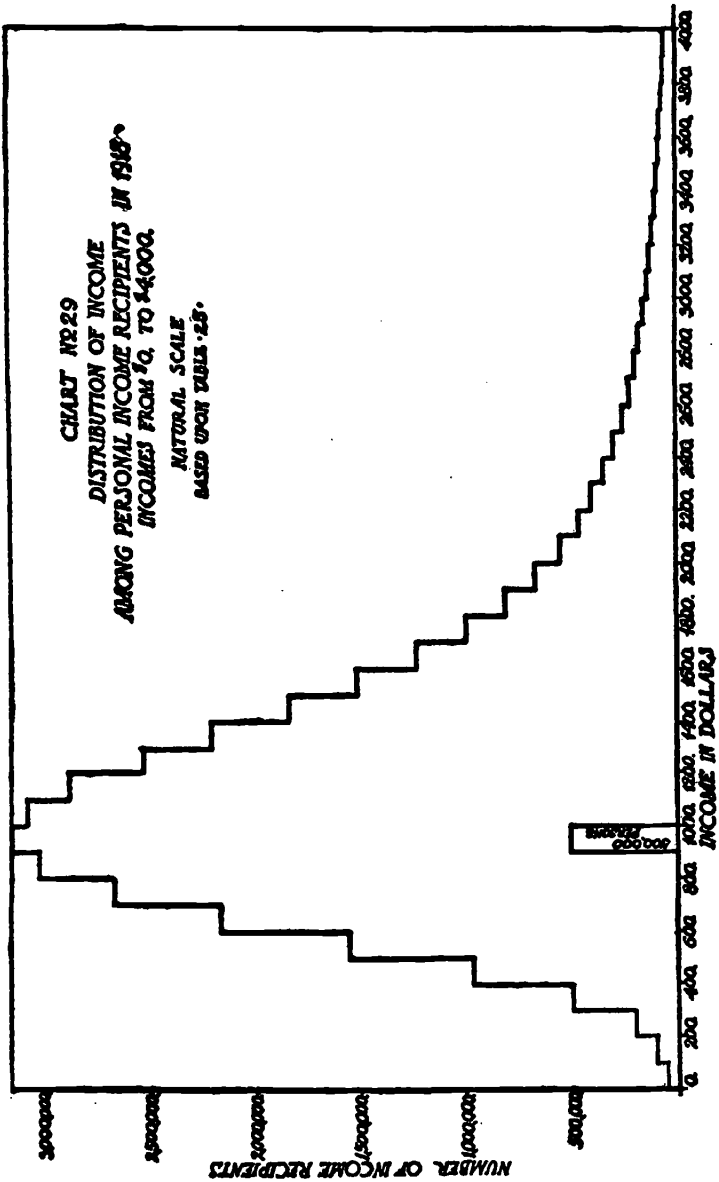


CHART N°29
DISTRIBUTION OF INCOME
AMONG PERSONAL INCOME RECIPIENTS IN 1918.
INCOMES FROM 0 TO $4000.
NATURAL SCALE
BASED UPON TABLE 25.
NUMBER OF INCOME RECIPIENTS
INCOME IN DOLLARS
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000

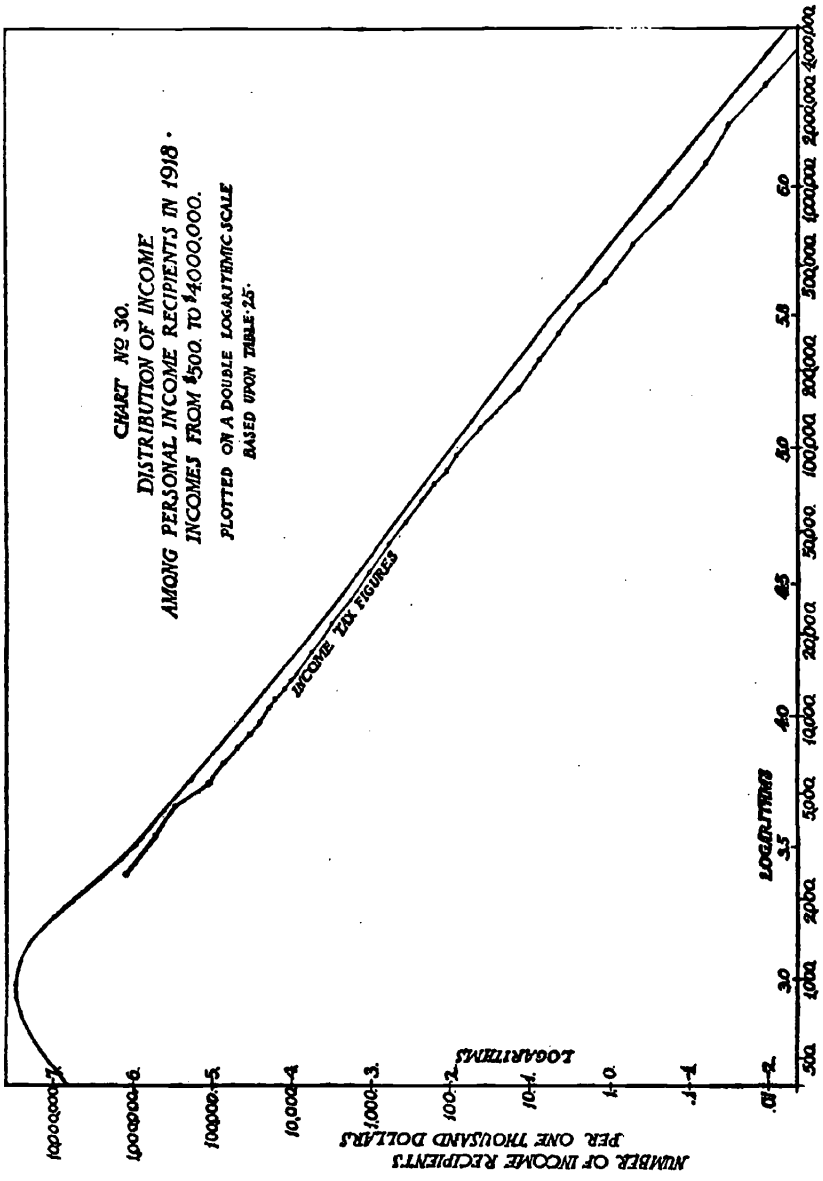


CHART No 30.
DISTRIBUTION OF INCOME
AMONG PERSONAL INCOME RECIPIENTS IN 1918.
INCOMES FROM $500. TO $4000,000.
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
BASED UPON TABLE 25.
INCOME TAX FIGURES
NUMBER OF INCOME RECIPIENTS PER ONE THOUSAND DOLLARS
LOGARITHMS
INCOME IN DOLLARS
LOGARITHMS
500
1000
2000
3000
5000
10000
20000
30000
50000
100000
200000
300000
500000
1000000
2000000
4000000

curately it pictures the general character of the distribution of incomes in the United States cannot be told until an actual census of a large and well-selected sample of incomes be taken, and taken with careful attention to small increments of income in the lower ranges. But to the best of our belief this curve harmonizes with what may be learned about the distribution of income in the United States in 1918 by statistical analyses of data now available.[1]

The "bump" on the income tax curve in the $4,000 to $5,000 interval, as shown in Chart 28, was eliminated, because consultations with officers of the Internal Revenue Bureau and field collectors convinced Mr. Macaulay that this "bump" was caused by the "intensive drive" for incomes under $5,000 made that year.

The reason why the curve on a double logarithmic scale (see Chart 30) runs closest to the income tax data at about $50,000 is that while the percentage of illegal evasion is believed to decrease as incomes increase, the percentage of "legal evasion" and the percentage of tax-exempt income increases as incomes increase. At about $50,000 the resultant of these three influences is a minimum.

[1] The Australian war time census of incomes gives a different shaped curve from the one here presented. It is impossible to express the American data on the basis of the Australian curve.

An interesting side light on "Pareto's Law" may be had from a glance at the distribution of income from $0 to $4,000 per annum shown by Chart 29 on a natural scale. "Pareto's Law" is seen to be a statement concerning the shape of the mere "tail" of the distribution. Any examination of numerous statistical frequency distributions on a double logarithmic scale will quickly convince the investigator that many distributions of very different types have "tails" as much like one another as the tails of the income tax data for different years.

Table 25 shows the results of this investigation in figures. The summary at the end of the table calls attention to a leading peculiarity of the distribution of incomes during the war. Of the very large numbers of soldiers, sailors and marines then in government service, some thousands doubtless are represented in the income-tax returns. But the vast majority had little if any income that year beyond the pay, food, and clothing provided by the government. Mr. Macaulay has estimated that about 2,500,000 men were in this position in 1918, all receiving an income, the money value of which was substantially the same —about $700 per year. To chart all these soldiers, sailors and marines at the same point of the in-

TABLE 25

DISTRIBUTION OF INCOME AMONG PERSONAL INCOME RECIPIENTS IN 1918

The numbers below are given to the nearest unit. It is not pretended that such arithmetic accuracy is anything more than technical.

Arithmetic average ..	$1543[1]	Lower quartile	$ 833[1]
	1490[2]	Median	1140[1]
Mode	$ 957[1]	Upper quartile	$1574[1]

Income Class	Number of Persons	Total Income
Under Zero[3]	200,000	$ — 125,000,000
$ 0 to $ 100	62,809	3,368,863
100 to 200	103,704	16,047,939
200 to 300	209,087	53,701,566
300 to 400	489,963	174,747,705
400 to 500	961,991	437,421,733
500 to 600	1,549,974	857,666,411
600 to 700	2,154,474	1,405,213,223
700 to 800	2,668,466	2,005,009,301
800 to 900	3,013,034	2,563,100,947
900 to 1,000	3,144,722	2,987,688,735
1,000 to 1,100	3,074,351	3,226,729,363
1,100 to 1,200	2,850,526	3,275,784,572
1,200 to 1,300	2,535,285	3,166,235,800
1,300 to 1,400	2,205,728	2,973,220,322
1,400 to 1,500	1,832,230	2,653,820,477
1,500 to 1,600	1,512,649	2,342,101,155
1,600 to 1,700	1,234,397	2,034,621,765
1,700 to 1,800	999,996	1,748,225,207
1,800 to 1,900	811,236	1,499,396,953
1,900 to 2,000	663,789	1,293,303,255
2,000 to 2,100	549,787	1,126,240,869
2,100 to 2,200	463,222	995,402,469
2,200 to 2,300	395,115	888,501,304
2,300 to 2,400	340,141	798,920,154
2,400 to 2,500	295,490	723,614,676
2,500 to 2,600	258,650	659,277,149
2,600 to 2,700	227,731	603,250,834
2,700 to 2,800	201,488	553,889,766
2,800 to 2,900	178,901	509,693,726
2,900 to 3,000	154,499	455,622,047
3,000 to 3,100	142,802	435,416,064
3,100 to 3,200	128,217	403,770,475
3,200 to 3,300	115,583	375,547,256
3,300 to 3,400	104,504	350,001,254

[1] Excluding soldiers.
[2] Including soldiers.
[3] Negative incomes—i. e., net loss for year.

TABLE 25 (*Continued*)

Income Class	Number of Persons	Total Income
$ 3,400 to $ 3,500	94,803	$ 326,995,740
3,500 to 3,600	86,405	306,672,255
3,600 to 3,700	79,023	288,376,342
3,700 to 3,800	72,562	272,057,360
3,800 to 3,900	66,900	257,520,712
3,900 to 4,000	61,894	244,442,121
4,000 to 5,000	430,474	1,913,291,198
5,000 to 6,000	234,721	1,280,426,762
6,000 to 7,000	143,330	926,352,841
7,000 to 8,000	94,927	708,947,016
8,000 to 9,000	66,511	563,480,394
9,000 to 10,000	48,335	457,976,300
10,000 to 11,000	36,432	381,732,274
11,000 to 12,000	28,306	324,954,833
12,000 to 13,000	22,473	280,498,570
13,000 to 14,000	18,174	245,042,041
14,000 to 15,000	14,951	216,555,666
15,000 to 20,000	46,869	805,775,269
20,000 to 25,000	24,857	553,731,410
25,000 to 30,000	15,205	415,329,030
30,000 to 40,000	17,063	589,416,333
40,000 to 50,000	8,851	394,040,324
50,000 to 60,000	5,220	285,043,633
60,000 to 70,000	3,389	219,188,048
70,000 to 80,000	2,361	176,418,311
80,000 to 90,000	1,730	146,629,939
90,000 to 100,000	1,311	124,249,645
100,000 to 150,000	3,494	421,980,443
150,000 to 200,000	1,451	249,585,378
200,000 to 250,000	771	171,676,103
250,000 to 300,000	460	125,604,380
300,000 to 400,000	497	170,757,868
400,000 to 500,000	248	101,980,849
500,000 to 750,000	265	139,293,673
750,000 to 1,000,000	104	80,826,726
1,000,000 to 1,500,000	79	94,956,294
1,500,000 to 2,000,000	30	51,697,546
2,000,000 to 3,000,000	24	57,818,419
3,000,000 to 4,000,000	9	30,846,960
4,000,000 and over	10	81,000,000
Total	**37,569,060**	**$57,954,722,341**

TABLE 25 (*Continued*)

Income Class	Number of Persons	Total Income
Under $2,000	32,278,411	$34,592,405,292
Over 2,000	5,290,649	23,362,317,049
Total (excluding 2,500,000 soldiers, sailors and marines[1])	37,569,060	$57,954,722,341
Soldiers, sailors and marines[1]	2,500,000	1,750,000,000
Grand Total	40,069,060	$59,704,722,341[2]

[1] Of the total number of soldiers, sailors and marines, 2,500,000 are taken as having an average income of $700.

[2] To make this figure comparable with the estimates of Mr. King and Mr. Knauth, it is necessary to add $1,700,000,000 (Mr. Knauth's estimate) for corporate surplus. When this addition is made, the three totals are, in billions:

Mr. King $60.4
Mr. Knauth 61.7
Mr. Macaulay 61.4

TABLE 26

THE PERCENTAGE ANALYSIS OF THE DISTRIBUTION OF PERSONAL INCOMES IN 1918

(Excluding 2,500,000 soldiers, sailors and marines)

(Based upon Table 25)

Income Class	Percentages of Total		Cumulative Percentages			
			Over the Class Below		Under the Class Above	
	Number of Persons	Amount of Income	Number of Persons	Amount of Income	Number of Persons	Amount of Income
Under Zero	.53	—.22	100.00	100.00	.53	—.22
$ 0 to $ 100	.17	.01	99.47	100.22	.70	—.21
100 to 200	.28	.03	99.30	100.21	.98	—.18
200 to 300	.56	.09	99.02	100.18	1.54	—.09
300 to 400	1.30	.30	98.46	100.09	2.84	.21
400 to 500	2.56	.75	97.16	99.79	5.40	.96
500 to 600	4.12	1.48	94.60	99.04	9.52	2.44
600 to 700	5.73	2.43	90.48	97.56	15.25	4.87
700 to 800	7.10	3.46	84.75	95.13	22.35	8.33
800 to 900	8.02	4.42	77.65	91.67	30.37	12.75
900 to 1,000	8.37	5.16	69.63	87.25	38.74	17.91
1,000 to 1,100	8.18	5.57	61.26	82.09	46.92	23.48
1,100 to 1,200	7.59	5.65	53.08	76.52	54.51	29.13
1,200 to 1,300	6.75	5.46	45.49	70.87	61.26	34.59
1,300 to 1,400	5.87	5.13	38.74	65.41	67.13	39.72
1,400 to 1,500	4.88	4.58	32.87	60.28	72.01	44.30
1,500 to 1,600	4.03	4.04	27.99	55.70	76.04	48.34
1,600 to 1,700	3.29	3.51	23.96	51.66	79.33	51.85
1,700 to 1,800	2.66	3.02	20.67	48.15	81.99	54.87
1,800 to 1,900	2.16	2.59	18.01	45.13	84.15	57.46
1,900 to 2,000	1.77	2.23	15.85	42.54	85.92	59.69
2,000 to 2,100	1.46	1.94	14.08	40.31	87.38	61.63

TABLE 26 (*Continued*)

Income Class	Percentages of Total		Cumulative Percentages			
			Over the Class Below		Under the Class Above	
	Number of Persons	Amount of Income	Number of Persons	Amount of Income	Number of Persons	Amount of Income
$ 2,100 to $ 2,200	1.23	1.72	12.62	38.37	88.61	63.35
2,200 to 2,300	1.05	1.53	11.39	36.65	89.66	64.88
2,300 to 2,400	.90	1.38	10.34	35.12	90.56	66.26
2,400 to 2,500	.79	1.25	9.44	33.74	91.35	67.51
2,500 to 2,600	.69	1.14	8.65	32.49	92.04	68.65
2,600 to 2,700	.61	1.04	7.96	31.35	92.65	69.69
2,700 to 2,800	.54	.96	7.35	30.31	93.19	70.65
2,800 to 2,900	.48	.88	6.81	29.35	93.67	71.53
2,900 to 3,000	.41	.79	6.33	28.47	94.08	72.32
3,000 to 3,100	.38	.75	5.92	27.68	94.46	73.07
3,100 to 3,200	.34	.70	5.54	26.93	94.80	73.77
3,200 to 3,300	.31	.65	5.20	26.23	95.11	74.42
3,300 to 3,400	.28	.60	4.89	25.58	95.39	75.02
3,400 to 3,500	.25	.56	4.61	24.98	95.64	75.58
3,500 to 3,600	.23	.53	4.36	24.42	95.87	76.11
3,600 to 3,700	.21	.50	4.13	23.89	96.08	76.61
3,700 to 3,800	.19	.47	3.92	23.39	96.27	77.08
3,800 to 3,900	.18	.44	3.73	22.92	96.45	77.52
3,900 to 4,000	.16	.42	3.55	22.48	96.61	77.94
4,000 to 5,000	1.15	3.30	3.39	22.06	97.76	81.24
5,000 to 6,000	.62	2.21	2.24	18.76	98.38	83.45
6,000 to 7,000	.38	1.60	1.62	16.55	98.76	85.05
7,000 to 8,000	.25	1.22	1.24	14.95	99.01	86.27
8,000 to 9,000	.18	.97	.99	13.73	99.19	87.24
9,000 to 10,000	.13	.79	.81	12.76	99.32	88.03
10,000 to 11,000	.10	.66	.68	11.97	99.42	88.69
11,000 to 12,000	.075	.56	.58	11.31	99.495	89.25
12,000 to 13,000	.060	.48	.505	10.75	99.555	89.73
13,000 to 14,000	.048	.42	.445	10.27	99.603	90.15
14,000 to 15,000	.040	.37	.397	9.85	99.643	90.52
15,000 to 20,000	.125	1.39	.357	9.48	99.768	91.91
20,000 to 25,000	.066	.96	.232	8.09	99.834	92.87
25,000 to 30,000	.040	.72	.166	7.13	99.874	93.59
30,000 to 40,000	.045	1.02	.126	6.41	99.919	94.61
40,000 to 50,000	.024	.68	.081	5.39	99.943	95.29
50,000 to 60,000	.0139	.49	.057	4.71	99.9569	95.78
60,000 to 70,000	.0090	.38	.0431	4.22	99.9659	96.16
70,000 to 80,000	.0063	.30	.0341	3.84	99.9722	96.46
80,000 to 90,000	.0046	.25	.0278	3.54	99.9768	96.71
90,000 to 100,000	.0035	.21	.0232	3.29	99.9803	96.92
100,000 to 150,000	.0093	.73	.0197	3.08	99.9896	97.65
150,000 to 200,000	.0038	.43	.0104	2.35	99.9934	98.08
200,000 to 250,000	.0020	.30	.0066	1.92	99.9954	98.38
250,000 to 300,000	.00122	.22	.0046	1.62	99.99662	98.60
300,000 to 400,000	.00132	.30	.00338	1.40	99.99794	98.90
400,000 to 500,000	.00066	.18	.00206	1.10	99.99860	99.08
500,000 to 750,000	.00071	.24	.00140	.92	99.99931	99.32
750,000 to 1,000,000	.00028	.14	.00069	.68	99.99959	99.46
1,000,000 to 1,500,000	.00021	.16	.00041	.54	99.99980	99.62
1,500,000 to 2,000,000	.00008	.09	.00020	.38	99.99988	99.71
2,000,000 to 3,000,000	.00006	.10	.00012	.29	99.99994	99.81
3,000,000 to 4,000,000	.00003	.05	.00006	.19	99.99997	99.86
4,000,000 and over	.00003	.14	.00003	.14	100.00000	100.00
Total.....	100.00000	100.00				

TABLE 27

A CONDENSED SUMMARY OF THE DISTRIBUTION OF PERSONAL INCOMES IN 1918

(Excluding 2,500,000 soldiers, sailors, and marines)

Based upon Table 25

Income Class	Simple Distribution		Cumulative Distribution			
			Over the Class Below		Under the Class Above	
	Number of Persons	Amount of Income	Number of Persons	Amount of Income	Number of Persons	Amount of Income
Under Zero	200,000	$ —125,000,000	37,569,060	$57,954,722,341	200,000	$ —125,000,000
$ 0-$ 500	1,827,554	685,287,806	37,369,060	58,079,722,341	2,027,554	560,287,806
500- 1,000	12,530,670	9,818,678,617	35,541,506	57,394,434,535	14,558,224	10,378,966,423
1,000- 1,500	12,498,120	15,295,790,534	23,010,836	47,575,755,918	27,056,344	25,674,756,957
1,500- 2,000	5,222,067	8,917,648,335	10,512,716	32,279,965,384	32,278,411	34,592,405,292
2,000- 3,000	3,065,024	7,314,412,994	5,290,649	23,362,317,049	35,343,435	41,906,818,286
3,000- 5,000	1,383,167	5,174,090,777	2,225,625	16,047,904,055	36,726,602	47,080,909,063
5,000- 10,000	587,824	3,937,183,313	842,458	10,873,813,278	37,314,426	51,018,092,376
10,000- 25,000	192,062	2,808,290,063	254,634	6,936,629,965	37,506,488	53,826,382,439
25,000- 50,000	41,119	1,398,785,687	62,572	4,128,339,902	37,547,607	55,225,168,126
50,000- 100,000	14,011	951,529,576	21,453	2,729,554,215	37,561,618	56,176,697,702
100,000- 200,000	4,945	671,565,821	7,442	1,778,024,639	37,566,563	56,848,263,523
200,000- 500,000	1,976	570,019,200	2,497	1,106,458,818	37,568,539	57,418,282,723
500,000-1,000,000	369	220,120,399	521	536,439,618	37,568,908	57,638,403,122
1,000,000 and over	152	316,319,219	152	316,319,219	37,569,060	57,954,722,341
Total	37,569,060	$57,954,722,341				

TABLE 28

THE PERCENTAGE ANALYSIS OF THE CONDENSED SUMMARY OF THE DISTRIBUTION OF INCOMES IN 1918

(Excluding 2,500,000 soldiers, sailors and marines)

Based upon Table 27

Income Class	Simple Distribution (Percentages[1] of Total)		Cumulative Distribution (Percentages of Total)			
			Over the Class Below		Under the Class Above	
	Number of Persons	Amount of Income	Number of Persons	Amount of Income	Number of Persons	Amount of Income
Under Zero	.5324	— .22	100.0000	100.00	.5324	— .22
$ 0-$ 500	4.8645	1.18	99.4676	100.22	5.3969	.96
500- 1,000	33.3537	16.94	94.6031	99.04	38.7506	17.90
1,000- 1,500	33.2670	26.40	61.2494	82.10	72.0176	44.30
1,500- 2,000	13.8999	15.39	27.9824	55.70	85.9175	59.69
2,000- 3,000	8.1584	12.62	14.0825	40.31	94.0759	72.31
3,000- 5,000	3.6817	8.93	5.9241	27.69	97.7576	81.24
5,000- 10,000	1.5646	6.79	2.2424	18.76	99.3222	88.03
10,000- 25,000	.5112	4.85	.6778	11.97	99.8334	92.88
25,000- 50,000	.1094	2.41	.1666	7.12	99.9428	95.29
50,000- 100,000	.0373	1.64	.0572	4.71	99.9801	96.93
100,000- 200,000	.0132	1.16	.0199	3.07	99.9933	98.09
200,000- 500,000	.0053	.98	.0067	1.91	99.9986	99.07
500,000-1,000,000	.0010	.38	.0014	.93	99.9996	99.45
1,000,000 and over	.0004	.55	.0004	.55	100.0000	100.00
Total	100.0000	100.00				

[1] These percentages do not exactly tally with those which would be derived from Table 26. This discrepancy is due to dropping decimals.

come scale would be a fair representation of the income-distribution of 1918, but it would obviously make the curve most unrepresentative of ordinary years. In their civil occupations the men who fought in 1918 had doubtless been making incomes distributed over a wide range in much the same fashion that other individual incomes were distributed. Hence these soldiers, sailors and marines have been left out of the curve.

The figures in Table 25 and in the analytic and summary tables based upon it are subject to all the limitations set forth in describing how the curve from which the figures are derived was made. No one should take these figures as more than an indication of the type of income distribution which probably prevailed in the United States in 1918. These figures refer to a single year and Charts 27 and 28 have shown ground for believing that the slope of the income-curve and possibly other significant features are appreciably altered by changes in business conditions. Even if the curve which we are presenting were a thoroughly accredited representation of income distribution in 1918, we could not be sure that it would represent faithfully income distribution in 1921.

Two warnings must be repeated. (1) The data in this table profess to represent total income, in-

cluding important items not subject to taxation. They therefore are not comparable with the official tables published by the Internal Revenue Bureau. Part of the discrepancy, but not all of it, is due to our estimates of the under-reporting and non-reporting of incomes. (2) Taxes are not deducted from personal incomes in this table, though in so far as the table is based upon income-tax returns it may have been affected by the provision that in reporting to the federal authorities income-tax payers may deduct personal taxes and all taxes on property not used for business purposes, except special assessments to pay for improvements which benefit property.

How large an amount of the income which is represented goes to the federal government in income taxes may be judged from Table 29 which is taken from the official *Statistics of Income*. Of course, these official figures refer only to reported incomes. Percentage rates of tax drawn from this table therefore cannot be applied to our estimates of total income in the corresponding classes. The only possible adjustment would be to subtract the *total income tax* paid from the *total amount of income* shown in our table for all persons having incomes over $2,000.

TABLE 29

THE DISTRIBUTION OF NET PERSONAL INCOMES REPORTED TO THE BUREAU OF INTERNAL REVENUE IN 1917 AND 1918 BEFORE AND AFTER DEDUCTION OF FEDERAL INCOME TAXES

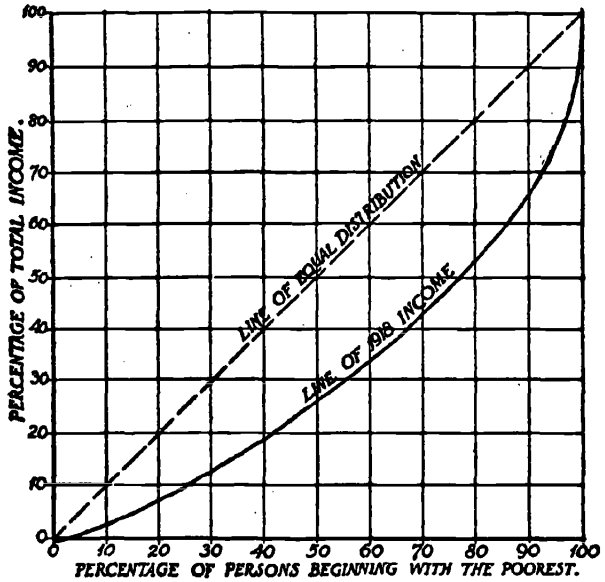
Income Classes	Average Rate of Tax; Per Cent.	Average Tax per Individual	Average Income Before Deducting Tax	Average Income After Deducting Tax	Percentage of Total Reported Income Before Deducting Tax	Percentage of Total Reported Income After Deducting Tax
1917						
$ 1,000-$ 2,000	.66	$ 10	$ 1,500	$ 1,490	18.04	18.86
2,000- 3,000	.44	11	2,462	2,451	15.12	15.86
3,000- 5,000	.36	33	3,773	3,740	15.50	16.19
5,000- 10,000	2.41	163	6,752	6,589	13.39	13.76
10,000- 25,000	4.78	717	14,997	14,279	12.36	12.40
25,000- 50,000	7.34	2,520	34,297	31,777	7.63	7.45
50,000- 100,000	10.04	6,836	68,084	61,248	6.20	5.88
100,000- 150,000	13.92	16,889	121,288	104,399	2.93	2.66
150,000- 300,000	18.27	36,949	202,238	165,289	3.48	2.99
300,000- 500,000	23.93	89,853	375,501	285,648	1.54	1.23
500,000-1,000,000	27.63	188,410	681,369	492,959	1.57	1.20
1,000,000 and over	35.65	776,064	2,176,141	1,400,077	2.24	1.52
1918						
$ 1,000-$ 2,000	1.19	$ 17	$ 1,472	$ 1,454	14.02	14.91
2,000- 3,000	.98	24	2,423	2,399	22.78	24.27
3,000- 5,000	2.35	89	3,792	3,703	22.20	23.33
5,000- 10,000	4.34	291	6,719	6,427	13.47	13.87
10,000- 25,000	8.20	1,222	14,897	13,675	10.90	10.76
25,000- 50,000	13.32	4,563	34,267	29,704	6.14	5.73
50,000- 100,000	21.69	14,749	67,999	53,251	4.27	3.60
100,000- 150,000	33.68	40,577	120,486	79,910	1.78	1.27
150,000- 300,000	44.64	89,872	201,470	111,598	1.92	1.14
300,000- 500,000	54.77	207,238	378,391	171,153	.91	.44
500,000-1,000,000	58.65	392,327	668,964	276,637	.75	.33
1,000,000 and over	64.65	1,326,646	2,052,043	725,398	.86	.33

To most minds, Charts 29 and 30 will probably give the clearest impression of the complex estimate set forth in our tables. But it is well to supplement these charts with a Lorenz curve representing the same set of figures. This device, used

CHART 31.

LORENZ CURVE SHOWING THE DISTRIBUTION OF INCOMES IN 1918.

Based upon the data presented in Table 26.



in Chart 31, shows graphically the deviation of the actual distribution of incomes from a perfectly even distribution. By looking at the two scales of this chart, the reader will see that if 10 per cent. of the income receivers got just 10 per cent. of the

total income, if 20 per cent. of them got just 20 per cent. of the total income, and so on, then the actual distribution would be represented by the straight diagonal line of the chart. From the "line of 1918 income" and the two scales, it is easy to see approximately what per cent. of the total income was obtained by any given percentage of the income receivers. For example, on the horizontal line, take the point marked "70 per cent."; follow the perpendicular line through this point to where it intersects the curve marked "Line of 1918 Income"; from this point of intersection, draw an imaginary horizontal line to the left until it intersects the left-hand perpendicular scale; it will be seen to intersect that scale at about "42½ per cent." This signifies, according to the chart, that the poorest 70 per cent. of income receivers had about 42½ per cent. of the National Income. Vice versa, the richest 30 per cent. had about 57½ per cent. of the National Income.