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## Chapter 4

### Available Measures of Capital Consumption

#### DEPRECIATION CHARGES

THE available data on business depreciation charges for 1919-35, supplemented by estimates of varying degrees of reliability, appear in Table 1. Depreciation of property held by unincorporated farmers is excluded. Because these figures are not estimated by farmers themselves they are presented and discussed separately in Chapter 6. For subgroups of non-manufacturing industries the figures are available only for 1929-34, and are confined to corporations (Appendix B, Table I).<sup>1 2</sup>

<sup>1</sup> Sources and the details of the various computations appear in a note appended to this chapter. Non-corporate establishments are distinguished from corporate in Table IV, Appendix B. Depreciation on fixed intangible assets is included in business depreciation charges. To that extent the present estimates overstate the depreciation of tangible fixed assets. However, this item is probably not very great. In 1934 intangible assets were about 5 per cent of property, plant, and equipment. Even if we do not exclude those intangibles that cannot be depreciated (such as goodwill and organization expense) on the assumption that they are balanced by non-depreciable tangible property (i.e., land), we have as an upper limit an estimate of depreciation on intangibles of about 200 million dollars in 1934. (We assume a rate of depreciation on intangibles equal to that on tangibles.)

<sup>2</sup> To prevent misuse of these figures it is necessary to emphasize at this point that the depreciation figures measure only very roughly the potential demand for replacements. There are three reasons for this: (a) capital consumption is inadequately represented by depreciation charges alone; (b) depreciation charges do not necessarily coincide with the rate of retirement; (c) demand for replacements is influenced by profit expectations and other factors.

*Industrial distribution of depreciation charges*

The total of the depreciation charges of an industry is a function of the value of its fixed assets, of their average durability, and of the accounting method by which the cost of the assets is distributed over their useful life.<sup>3</sup> The last two factors combined are reflected by the ratios of depreciation charges to depreciable capital assets. In Table 2 the closest available approximations to these ratios are presented: for 1926-34, depreciation and depletion as percentages of total net property, plant, and equipment; and for 1934, depreciation and depletion as percentages of gross property, excluding land.<sup>4</sup> (Depletion is included because published property accounts cover depletable as well as depreciable assets. The exclusion of depletion from the numerator would lower considerably the ratios for mining, lumber, and chemicals alone.) The variation in these ratios, by industries, is the combined result of variation in the average rate of depreciation among the individual industries and of variation in the accounting treatment of capital goods. The second may be important. Thus, the ratio in public utilities is lowest mainly because depreciation is in this industry a secondary method of recording capital consumption.

The industrial distribution of the figures in Table 1 for 1919-34 is affected by the practice of classifying a consolidated corporate report according to the predominant business of

<sup>3</sup> In the tables in this volume the most detailed industrial classifications available have, in the main, been used. Consequently, certain breakdowns into subgroups may be found in one section and not in another.

<sup>4</sup> The percentages based on net property are rough approximations to the actual average rates of depreciation and depletion used in computing charges for depreciation and depletion. They tend to be overstated because the capital assets are net, after deduction of reserves for depreciation and depletion. They tend to be understated because the capital assets include land and because the book value of the capital assets, to the extent that write-ups have occurred, tend to overstate the cost of depreciable assets. These over- and understatement only partly offset one another, as is apparent from comparison with the figures in the last column of Table 2. The data underlying the last column were obtained from a special tabulation made by the Bureau of Internal Revenue (see Table VIII, Appendix B).

Table 1  
Business Depreciation Charges, 1919-1935  
By Industries<sup>1</sup> (Unit: \$1,000,000)

	OLD CLASSIFICATION <sup>3</sup>						
	1919	1920	1921	1922	1923	1924	1925
<i>Industrial group</i>							
Mining and quarrying	211.6	224.3	296.6	351.4	400.3	384.0	295.3
Manufacturing	1006.1	1110.9	1167.8	1325.7	1386.8	1373.7	1493.0
Construction	103.4	113.1	93.4	103.1	89.8	103.5	125.0
Transportation and other public utilities	356.9	325.6	425.4	442.9	484.3	521.3	587.9
Trade	324.6	291.4	295.4	294.9	339.6	342.7	386.7
Service	76.5	88.7	98.4	130.4	128.2	147.2	153.8
Finance and real estate	301.6	336.2	283.6	404.9	330.8	392.7	413.1
Miscellaneous	37.7	36.1	34.9	29.8	30.6	16.9	12.6
Grand total	2418.4	2526.3	2695.5	3083.1	3190.4	3282.0	3467.4
<i>Manufacturing subgroup</i>							
Food and tobacco	200.0	174.6	171.6	185.3	196.2	210.9	214.7
Textiles and leather	152.1	150.8	164.9	179.2	183.8	197.7	206.9
Lumber, stone, clay, glass	101.4	114.0	136.0	145.8	151.2	147.3	151.3
Paper	33.8	42.6	44.6	45.8	47.4	47.5	49.6
Printing and publishing	33.6	42.7	49.5	48.9	48.7	54.4	59.6
Chemicals	40.6	85.4	127.8	225.7	207.4	164.3	252.5
Metals	329.4	379.5	354.6	361.6	406.9	450.4	477.1
Misc. manufacturing	115.2	121.2	118.8	133.4	145.2	101.2	81.3
Total manufacturing	1006.1	1110.9	1167.8	1325.7	1386.8	1373.7	1493.0

<sup>1</sup> Not including farmers.

<sup>2</sup> Shift in classification: see *Statistics of Income for 1932*, p. 22.

the group. For 1934 constituent companies of consolidated groups were classified separately also. A similar classification is available for 1935. The two sets of 1934 figures indicate the effects of the practice mentioned.<sup>5</sup> When the consolidated reports are broken down there is a net transfer from manufacturing, especially foods, metals, and chemicals (including petroleum) to the other industrial groups. But in the new classification also there is overlapping, since even a single

<sup>5</sup> The two totals for 1934 differ slightly because non-corporate depreciation is estimated for each group separately; see Note to Chapter 4.

1926	1927	1928	1929	1930	1931	1932	1933	1934	NEW CLASSIFICATION <sup>4</sup>	
									1934	1935
245.0	242.3	216.5	238.6	203.2	203.0	173.3	159.9	156.6	179.4	168.7
1639.8	1717.5	1794.9	1878.6	1945.4	1848.6	1681.1	1631.1	1546.2	1413.3	1380.7
99.7	107.2	119.1	130.5	109.0	98.5	91.7	96.3	84.8	89.0	89.3
720.5	793.5	897.7	982.6	1022.5	1123.2	1061.6	996.1	968.1	1004.8	1032.9
397.1	415.0	446.9	469.2	478.6	474.4	421.7	374.5	360.3	392.2	389.1
323.2	197.9	225.9	259.4	260.4	256.7	303.8 <sup>2</sup>	272.8	263.0	272.8	283.5
519.0	481.1	551.7	597.6	610.3	605.2	555.4 <sup>2</sup>	561.5	550.1	587.3	580.9
5.0	5.9	5.2	5.3	5.2	5.4	4.0	4.5	5.8	4.6	4.5
3949.3	3960.4	4257.9	4561.8	4634.5	4615.0	4292.6	4096.7	3934.9	3943.4	3929.6
226.6	233.7	235.9	245.5	251.9	241.1	231.8	223.7	221.5	206.0	194.1
193.8	203.9	207.9	209.8	201.1	199.8	175.1	182.1	163.4	164.1	158.8
164.0	164.3	172.0	168.1	167.7	150.5	131.3	122.9	116.3	115.3	109.1
56.4	58.7	64.8	64.5	66.2	67.8	64.5	65.4	63.0	63.0	60.9
63.9	63.9	67.3	73.0	72.6	79.0	67.6	63.5	58.8	55.9	54.9
340.6	377.2	402.0	427.2	473.1	456.0	429.9	416.9	379.7	298.8	298.5
505.9	528.8	558.6	594.6	607.6	556.8	493.2	473.2	467.5	436.0	441.4
88.7	87.1	86.5	95.9	105.2	97.7	87.5	83.6	76.0	74.2	63.0
1639.8	1717.5	1794.9	1878.6	1945.4	1848.6	1681.1	1631.1	1546.2	1413.3	1380.7

<sup>3</sup> Consolidated corporate reports classified by predominant business of group as a whole.

<sup>4</sup> Constituent companies of consolidated groups classified separately.

corporation can engage in several different branches of industry at the same time.

### *Changes in depreciation charges, 1919-1935*

All the industries in Table 1 did not retain the same relative levels during the period covered. Manufacturing remained at the top, and construction at the bottom for all or most of the period. But transportation, service, and mining among the major groups, and chemicals among the manufacturing

Table 2

Depreciation and Depletion Charges in Relation to Capital Assets, 1926-1934<sup>1</sup>  
Corporations, by Industries

	DEPRECIATION AND DEPLETION CHARGES AS A PERCENTAGE OF									
	Gross Capital Assets (excl. land)									
	Net Capital Assets									
	1926	1927	1928	1929	1930	1931	1932	1933	1934	1934
<i>Industrial group</i>										
Mining and quarrying	6.2	6.0	6.1	6.3	5.0	4.4	4.1	4.3	4.9	4.0
Manufacturing	6.5	6.9	7.0	7.1	7.0	6.5	6.5	6.6	6.9	4.3
Construction	8.1	7.8	8.0	8.1	8.1	9.5	8.5	8.2	8.6	5.2
Transportation and other public utilities	1.8	1.7	1.9	1.9	1.9	2.2	2.1	2.0	1.9	1.7
Trade	5.9	5.9	5.7	5.9	6.2	6.6	6.6	6.6	6.5	5.5
Service	8.0	4.2	4.6	4.9	4.8	5.0	3.9	3.8	3.7	3.5
Finance and real estate	1.8	1.5	1.6	1.7	1.7	1.9	2.0	2.0	2.1	2.6
Grand total 2	3.9	3.6	3.7	3.7	3.6	3.6	3.6	3.5	3.5	2.9
<i>Manufacturing subgroup</i>										
Food and tobacco	5.9	5.8	6.2	5.9	6.2	6.6	6.5	6.4	6.6	4.5
Textiles and leather	6.2	6.2	6.3	6.4	6.4	6.8	6.5	7.1	6.6	3.8
Lumber and stone, clay and glass	6.7	6.7	6.8	6.7	6.3	5.7	5.1	5.3	5.4	4.0
Paper	5.5	5.6	5.8	5.2	5.3	5.6	5.3	5.7	5.9	4.0
Printing and publishing	6.8	6.6	6.8	6.9	6.5	7.4	6.4	6.8	6.6	4.4
Chemicals	9.0	9.8	9.6	9.7	9.7	7.1	8.8	8.6	9.2	4.8
Metals	5.7	6.2	6.4	6.6	6.3	5.9	5.5	5.7	6.0	4.0
Misc. manufacturing	5.7	6.9	6.9	7.2	7.6	8.0	7.8	8.1	7.7	4.2
Total manufacturing	6.5	6.9	7.0	7.1	7.0	6.5	6.5	6.6	6.9	4.3

<sup>1</sup> Some of the changes from year to year are due to shifts in *Statistics of Income* and are available only since 1925.

classification. The ratios are derived from figures published in <sup>2</sup> Includes miscellaneous companies not elsewhere classified.

subgroups, varied in relative position. However, just as the dollar amount of depreciation charges for a given period is a function of the several variables mentioned above, so are changes in depreciation charges to be ascribed to changes in these variables.

The average rate of depreciation does not appear to have changed very much during the period for which figures are available (Table 2). The variation that is visible is probably due to fluctuations in depletion charges as output of minerals rose and fell. Changes in accounting usage may have contributed to the fluctuations during the period. For example, since our figures are derived from tax reports some of the changes in Table 1 may be due to changes in tax regulations. These possibilities will be discussed in Chapter 5. On the whole, however, the movements in Table 1 appear to arise mainly from changes in the book value of the underlying assets.

Changes in classification are undoubtedly responsible for some of the time variation indicated. One such change is noted in a footnote to Table 1. It is possible that others, of less obvious effect, have occurred.<sup>6</sup> This seems to be true for service in 1926, for mining during several years of the period, and for chemicals during 1922-25. The fluctuations in mining and chemicals partly counterbalance one another, shifts in classification having occurred from one of these industries to the other.

Inflexibility in total calculated depreciation charges is outstanding. With the exception of a slackening of growth in 1927 there is hardly a response to the cyclical variations in business until 1930. No rise between 1933 and 1935 is revealed.

#### DEPLETION CHARGES

Natural resources are separated from other forms of capital because of their relatively long life and the difficulties involved

<sup>6</sup> See the discussion of the industrial classifications of *Statistics of Income*, the chief source of our figures, by Ralph C. Epstein and other authors mentioned by him: *Industrial Profits in the United States* (National Bureau of Economic Research, 1934), pp. 548-57.

in determining their quantity and the probable conditions of their extraction. Forest reserves, since in these respects they are much more like ordinary capital goods, may be treated differently from other depletable resources. However, where replacement has not been the rule, as in the United States, they are classed with mines, oil wells, and quarries.

Comprehensive data on business depletion charges are available only since 1924 (Table 3); for corporations in subgroups of non-manufacturing industries, for 1929-34, see Table II, Appendix B.<sup>7</sup>

#### *Industrial distribution of depletion charges*

Depletion charges bulk large in the enterprises engaged in the extraction and initial processing of minerals, mineral oils, and timber. These enterprises are included chiefly in mining, and in manufacturing of lumber products, stone, clay and glass products, metals, and chemicals (including petroleum products). This industrial distribution is revealed not only by the dollar charges for depletion but also by the percentages of charges for depletion to depreciation charges. For all industries the percentage was 13 in 1929. It was over 100 in the miscellaneous group, which includes forestry, and in mining. In lumber and chemicals also it exceeded the average of 13 per cent. The percentage for metal manufacturing was 6, and for paper and public utilities, 3. In all other groups the percentage was very small.

In seven of the ten years 1925-34 depletion charges reported by manufacturing concerns exceeded those reported by mining companies. The change in the relative positions of mining and manufacturing between 1926 and 1927 may be ascribed to the increase in the output of oil products as compared with other minerals, and to some extent to the increased consolidation of the extractive and processing functions within large integrated corporations. The 'new' classification

<sup>7</sup> Data on depletion, but only in combination with those on depreciation, are available since 1918 (Table III, Appendix B).

for 1934 and 1935 shows depletion charges in mining greater than those in manufacturing.

*Changes in depletion charges, 1925-1935*

Depletion charges as a whole do not rise before 1930. Their most interesting features are the large decline paralleling the course of the business recession beginning in 1929 and the rise from 1932 or 1933 to 1935. This is apparent in almost all the industries in which depletion is important. (The large random fluctuations in some groups should be ascribed chiefly to shifts in classification.) Counting 1929 as 100, total depletion charges were 83 in 1930, 48 in 1931, 44 in 1932 and 1933, 56 in 1934, and 62 in 1935. This large fluctuation is a combined result of the current methods of computing depletion charges and of the severe fall and rise in the output of mineral and timber products. Some part of the decline in depletion charges arises from changes in the methods of computing them.

PROVISION FOR ACCIDENTAL LOSS

The losses caused by 'accidents' cannot be distinguished easily from the loss and damage, incurred in the ordinary course of business, that are represented by charges for depreciation or maintenance. There is, however, a distinction implicit in business computations. Losses against whose possibility insurance may be taken are for that very reason treated separately from other types of damage. Losses the probability of which is believed to be extremely small may be ignored in ordinary computations and charged as capital adjustments when they occur.

Figures relating to two major types of accidental loss are available: fire and shipwreck (Table 4). Two sets of figures are presented: the actual losses incurred in each year, and the annual provision made for expected losses. A breakdown by industries is not available. Other types of loss (for example, those caused by flood and earthquake), if covered by reliable figures, would be included among capital adjustments, as sug-



*Manufacturing subgroup*

Food and tobacco	1.4	0.9	0.8	1.9	2.0	0.7	2.2	0.8	0.3	1.4	1.4	0.3
Textiles and leather	11.3	5.4	0.4	1.0	1.0	0.2	0.2	0.5	0.4	0.2	0.2	0.2
Lumber and stone, clay and glass	54.3	66.6	62.4	66.8	61.1	48.5	26.6	18.4	21.7	23.4	22.8	28.0
Paper	1.2	1.0	1.5	2.4	2.2	2.4	1.7	1.0	1.3	1.7	1.6	2.9
Printing and publishing	1.0	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0
Chemicals	65.1	160.4	151.5	160.7	177.0	169.1	86.0	92.4	77.7	114.2	80.9	95.8
Metals	21.2	28.5	26.9	34.4	33.2	27.1	8.8	7.4	12.4	14.4	4.6	6.8
Misc. manufacturing	0.9	0.4	0.5	0.4	0.5	0.6	0.3	0.2	0.3	0.2	0.2	0.1
Total manufacturing	156.5	263.4	244.2	267.7	277.1	248.7	125.8	120.8	114.3	155.6	111.8	134.1

<sup>1</sup> Not including farmers.

<sup>2</sup> Consolidated corporate reports classified by predominant business of group as a whole.

<sup>3</sup> Constituent companies of consolidated groups classified separately.

Table 4

Business Losses caused by Accident, and Provision made for Expected Losses, 1919-1935

Fixed Capital Assets <sup>1</sup> (Unit: \$1,000,000)

	LOSSES CAUSED BY FIRE	LOSSES CAUSED BY MARINE WRECKS AND CASUALTIES	FIRE AND MARINE LOSSES COMBINED	PROVISION FOR FIRE AND MARINE LOSSES
1919	126.3	38.1	164.4	208.7
1920	176.5	55.0	231.5	217.7
1921	195.2	28.7	223.9	217.1
1922	199.6	18.7	218.3	211.5
1923	210.9	17.2	228.1	209.5
1924	216.3	14.2	230.5	206.6
1925	220.4	15.2	235.6	211.5
1926	221.4	15.6	237.0	223.6
1927	186.3	18.7	205.0	235.2
1928	183.1	16.6	199.7	230.2
1929	181.0	16.2	197.2	222.6
1930	197.8	21.1	218.9	206.3
1931	177.9	12.2	190.1	190.7
1932	157.9	11.9	169.8	168.2
1933	107.0	9.7	116.7	158.3
1934	106.9	10.4	117.3	156.2
1935	98.0	15.0	113.0	160.0

<sup>1</sup> Including farm property.

gested in Chapter 2. Figures for certain relatively unimportant types, such as loss from tornadoes, are available; but these merit merely mention.<sup>8</sup>

#### *Fire losses*

Fire losses rose from 1919 to 1926 and then fell off by 1935 to the lowest point of the period covered. The most interesting features of the series are its relative stability and its relative smallness. This stability is, of course, the basis for dependable actuarial computations and the existence of fire insurance. But

<sup>8</sup> For total losses caused by tornadoes see Table V, Appendix B.

fire losses may rise radically when a conflagration occurs. The San Francisco fire of 1906 cost the nation about 350 million dollars: over 25,000 buildings and their contents were destroyed. One major disaster of this sort can wipe out a large fraction of a year's gross increment in capital. However, during the period covered by the present estimates there was no major conflagration.

There is another reason for the small losses from fire. The rate of fire loss has been decreasing steadily over the last century, and the declining trend is visible even in the last fifteen or twenty years. This trend is revealed by the annual net rate of premium charged, per hundred dollars of insurance, which has fallen radically. For one company the figures are:<sup>9</sup>

<i>Decade ending</i>		<i>Decade ending</i>	
1845	\$.84	1895	\$.162
1855	.39	1905	.112
1865	.308	1915	.066
1875	.355	1925	.033
1885	.229	1935	.028

These two factors account for the small percentage of fire losses to depreciation charges. In 1929 this was less than 4 per cent.

#### *Marine wrecks and casualties*

Very much smaller than fire losses are losses arising from marine wrecks, collisions, strandings, etc. In this series also there is fair stability. As is true of fire losses, the 1933-34 amounts were the lowest of the period covered. The peak, however, was reached in 1920.

#### *Provision for losses*

The annual provision for fire and marine losses (Table 4) is naturally much more stable than the losses themselves.

Provision for both fire and marine losses together was only

<sup>9</sup> Manufacturers Mutual Fire Insurance Company, *The Factory Mutuals, 1835-1935* (Providence, 1935), p. 189.

Table 5

Maintenance Charges, other than Depreciation and Retirements,  
1919-1935Public Utilities (*Unit: \$1,000,000*)

	1919	1920	1921	1922	1923	1924	1925
Steam railways, total	1,934.2	2,555.5	1,905.0	1,862.5	2,133.8	1,895.2	1,901.4
Ways and structures	794.4	1,058.1	770.2	741.4	828.0	805.1	828.1
Equipment	1,139.8	1,497.4	1,134.9	1,121.1	1,305.9	1,090.0	1,073.2
Electric railways, total	144.4	173.1	169.7	168.3	172.3	169.9	164.6
Ways, structures, and power	82.3	98.4	96.2	95.2	96.1	93.4	89.1
Equipment	62.1	74.7	73.4	73.1	76.2	76.5	75.5
Telephones	72.3	88.7	91.9	99.2	111.5	122.4	132.2
Electric light and power	60.7	71.6	72.4	74.7	78.0	83.9	90.3
Telegraphs and ocean cables	14.2	16.1	14.0	14.1	14.9	14.9	16.7
Manufactured gas	20.4	23.4	26.3	26.8	28.2	28.2	28.2
Pullman Company	20.5	27.6	33.7	24.9	25.9	28.7	28.4
Express companies	6.7	7.4	7.6	6.1	6.2	5.8	5.6
Natural gas	6.4	7.8	7.0	8.9	9.6	10.2	10.6
Pipe lines (oil and gasoline)	4.4	5.1	5.7	6.3	6.4	7.2	8.1
Water works (private)							
Grand total <sup>1</sup>	2,288.9	2,982.7	2,338.2	2,296.7	2,592.1	2,371.7	2,391.6

<sup>1</sup> The 1929 total, inclusive of water works, was extrapolated to 1919 by use of the total exclusive of water works.

a small fraction of depreciation charges. In 1929, this was less than 5 per cent.

## MAINTENANCE AND REPAIRS

It is difficult to distinguish repairs and 'ordinary' maintenance from renewals of parts or even from complete renewals. The lines drawn are arbitrary. Expenditures for so-called 'maintenance and repairs' may be charged to current expenses, to deferred charges, to reserves for depreciation, or to the fixed asset accounts. Here we shall concern ourselves with maintenance and repairs charged to current expense or to deferred

1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
1,968.7	1,893.7	1,805.1	1,838.8	1,512.1	1,146.3	773.0	733.4	827.1	897.4
879.0	877.0	848.1	863.4	709.0	535.1	352.2	324.1	369.2	398.6
1,089.8	1,016.7	957.0	975.4	803.0	611.1	420.8	409.3	457.9	498.8
162.9	157.7	140.5	146.7	138.9	114.7	91.0	82.4	90.3	93.2
86.8	82.6	66.5	75.2	72.7	61.8	49.3	44.9	50.0	52.9
76.1	75.1	74.0	71.5	66.2	52.9	41.6	37.5	40.3	40.3
147.0	160.6	177.1	205.0	217.0	200.1	180.6	184.2	194.5	194.3
95.5	100.2	104.0	102.3	100.5	92.6	78.4	74.7	81.5	86.5
17.6	17.1	17.8	19.1	15.5	12.9	10.5	9.8	10.0	9.8
30.8	32.1	31.9	31.7	30.0	26.6	22.6	20.3	23.1	21.3
30.2	28.4	28.7	30.2	30.3	26.7	20.4	18.8	21.1	26.6
5.5	5.3	5.0	4.8	4.3	3.7	2.7	2.7	2.9	2.8
12.0	12.7	14.5	16.5	16.6	16.5	15.4	14.4	15.0	16.9
8.5	9.6	10.9	12.3	11.7	10.9	10.4	10.6	9.8	9.7
			6.1	5.5	5.3	5.1	5.0	6.1	5.7
2,484.6	2,423.4	2,341.4	2,413.5	2,082.4	1,656.2	1,210.2	1,156.2	1,281.2	1,364.3

charges,<sup>10</sup> accepting the accounting convention that distinguishes between these charges and those made to the capital asset (and valuation) accounts. The latter are covered in our measures of capital consumption by the depreciation charges already examined.

In the following sections attention will be paid to the relative magnitudes and the fluctuations revealed by the available data on maintenance charges, by industries. It is convenient to

<sup>10</sup> Since data on credits to deferred charge accounts are meager, they are not treated separately. Instead charges to deferred-charge accounts are combined with maintenance and repairs.

distinguish certain major industrial groups and to treat the figures for each separately. For public utilities figures are available for the entire period with which we are concerned. For the industrial groups (mining, manufacturing, trade, and construction) reliable data are available for 1934-35 only. Some meager material is obtainable on maintenance and repairs of business buildings.

### *Public utilities*

Maintenance charges, by minor groups of public utilities, are assembled in Table 5. The figures are large. Their size can be better appreciated if we compare maintenance charges with the corresponding depreciation charges (Table 6). In six

Table 6

### Maintenance and Depreciation Charges Compared

#### Public Utilities

	CHARGES FOR DEPRECIATION AND RETIREMENTS AS A PERCENTAGE OF MAINTENANCE CHARGES
Steam railways, total	15.6
Ways and structures	1.4
Equipment	28.4
Electric railways, total	25.3
Ways, structures, and power	26.6
Equipment	23.6
Telephones	89.3
Telegraphs and ocean cables	29.2
Electric light and power	132.2
Manufactured gas	91.2
Natural gas	544.0
Pipe lines	374.0
Express companies	105.7
Water works (private)	75.5

SOURCE: Steam railways, express companies—*Statistics of Railways, 1929, 1933*; electric railways, electric light and power—*Census of Electrical Industries, 1927*; telegraphs and ocean cables—*Postal Telegraph, 1931*; telephone—*Bell System, 1929*; manufactured gas—*American Gas Association, 1929*; natural gas, water works—sample of corporate reports for 1934 and 1929, compiled by the National Bureau of Economic Research; pipe lines—*National Resources Board, Report, Part III, pp. 371-2*. No data are available for the Pullman Company.

groups, the more important of the ten, depreciation and retirement charges were less than maintenance charges.<sup>11</sup> In the railway groups (steam and electric) and in telegraphs, the percentages were especially low. The accounting procedure prevalent among steam railroads is thrown into bold relief by the percentage of depreciation charges on ways and structures to cost of maintenance: 1.4 per cent is extraordinarily low.<sup>12</sup>

The diverse trends revealed by Table 5 reflect, chiefly, the changing relative importance of each public utility group (other factors may be price and technological changes). Declining trends are noticeable in the maintenance charges of steam railways, electric railways, and express companies. Rising trends characterize the telephone group, telegraphs, natural gas, pipe lines, and electric light and power. The Pullman Company charged maintenance at about the same amount throughout the period.

The recession beginning in 1929 is very clearly outlined in the figures for each group, with lags in telephones, natural gas, and Pullman. The decline in 1921 or 1922 is pronounced in the steam railroad and Pullman Company charges. (For telegraphs, express companies, and natural gas, the decline in 1921 or 1922 may arise from our method, necessarily rough, by which maintenance charges were estimated for the earlier years.)

### *Industrial concerns*

Even in industrials, where expenditures on durable goods are more often treated on a depreciation than on a maintenance basis, costs of maintenance and repairs are large (Table 7). For

<sup>11</sup> The depreciation charges used in Table 6 differ somewhat from those in *Statistics of Income* for corresponding groups (quoted in Table I). This may be explained chiefly by differences in classification, including those arising from the consolidation of corporate reports for tax purposes.

<sup>12</sup> The ratio of the depreciation reserve (ways and structures) to the gross property account is also very low: 0.68 per cent in 1934. A similar ratio for electric railways (road and equipment) was 6.3 per cent in 1927 and 9.7 per cent in 1932 (*Census of Electrical Railways, 1932*, p. 63).

Table 7

## Estimated Maintenance and Repairs, 1934-1935

Industrial Concerns (*Unit: \$1,000,000*)

	1934	1935
Mining	256	269
Manufacturing, total	1,247	1,445
Food and tobacco	181	190
Textiles and leather	135	144
Lumber and stone, clay and glass	69	84
Paper	49	52
Printing and publishing	16	19
Chemicals	227	258
Metals	528	641
Misc. manufacturing	42	57
Construction	61	68
Trade	131	134
Service	71	74
Grand total <sup>1</sup>	1,768	1,991

<sup>1</sup> Including 'miscellaneous'.

industrial concerns alone, excluding public utilities, real estate, and agriculture, maintenance charges were 1.8 billion dollars in 1934 and almost 2 billion in 1935. The total is half again as large as the corresponding total for public utilities (Table 5). Not only is the total large: it appears to be flexible. In the one year interval covered in Table 7 total charges for industrial maintenance rose one-eighth—a rise greater than in maintenance charges of public utilities.

The ratio of charges for depreciation and depletion to maintenance and repair charges is greater than unity in most of the industries covered in Table 8. While the figures are for 1934 and therefore probably somewhat higher than they were in 1929, the contrast with public utilities (Table 6) is so great that it can scarcely be attributed solely to the difference in dates. To indicate the generality of these large ratios, the industrial classification of Table 8 is given in greater detail than in the preceding table. The metals group is broken down to make clear just which subgroups are responsible for its low

Table 8

## Maintenance Charges and Charges for Depreciation and Depletion Compared, 1934

## Industrial Corporations

COMPANIES	PERCENTAGE	NUMBER OF CORPORATIONS	CHARGES FOR DEPRECIATION AND DEPLETION AS A PERCENTAGE OF CHARGES FOR MAINTENANCE	
			COMPANIES	PERCENTAGE
Mining		18		117.1
Manufacturing				
Foods		25		120.8
Beverages		8		213.7
Tobacco		10		123.8
Textiles		28		123.3
Leather		7		113.9
Rubber		3		178.6
Lumber		5		156.5
Stone, clay, and glass		19		208.8
Paper		16		131.6
Printing and publishing		7		363.6
Chemicals		43		217.9
Metals		112		91.2
Iron and steel		22		87.7
Nonferrous metals		12		111.4
Machinery		35		121.2
Automobiles and accessories		22		75.4
Misc. metals		21		162.1
Misc. manufacturing		11		186.6
Construction		7		139.9
Trade		36		277.0
Service		10		369.0

ratio. These are the automotive products group and iron and steel.

For years prior to 1934 there is little information on maintenance and repairs of industrial enterprises. Figures for 32 large corporations obtained from published reports suggest that charges for maintenance and repairs have fluctuated violently. Their absolute decline from 1929 to 1932 was general. The ratio of maintenance to depreciation rose between 1929 and 1932 in only 4 companies.

*Real estate*

Maintenance of the real property owned by public utilities and by concerns engaged in manufacturing and fields other than real estate have already been included in Tables 5 and 7. For rented real estate, estimates may be made for 1929-33 (Table 9). Maintenance costs were more than 200 million dol-

Table 9

Estimated Maintenance Charges and their Relation to Depreciation Charges, 1929-1933

Rented Business Real Estate <sup>1</sup>

	1929	1930	1931	1932	1933
Estimated maintenance charges (\$1,000,000)	224.5	216.4	159.2	103.5	109.0
Depreciation charges as a per- centage of maintenance charges	283	296	394	609	585

<sup>1</sup> Excluding residential property.

lars in 1929, about 10 per cent of those of public utilities. In 1933, they fell to 100 million, a percentage decline of approximately the same magnitude as for public utilities.

Depreciation charges as percentages of maintenance charges are very large, from three to six hundred per cent. Among the three groups—public utilities, industrials, and real estate—it is in real estate that maintenance charges are least important as an element of capital consumption.

CAPITAL EXPENDITURES CHARGED TO INCOME

In the long run the significance of the distinction between capital and revenue expenditures tends to vanish. When fiscal periods are short, as they must be in a dynamic economic system, the distinction is important and has been one of the major objectives of business accounting. Consequently capital expenditures are rarely charged immediately to current expense.<sup>13</sup> One exception occurs when secret reserves are built

<sup>13</sup> The discussion here concerns fixed tangible assets. Expenditures on intangibles are often charged to current operations.

up, but in the nature of the case no broad body of data is available concerning the extent or importance of this exception. We may assume that Federal tax and other regulations have tended to restrict this sort of financial manipulation, whether for honest or dishonest ends.

There is a second exception. To avoid excessive cost of record-keeping, capital items of a value below a certain minimum are usually charged to current operations. Thus, in the case of railroads, "if the total cost of additions and betterments to any class of equipment, or any class of fixed improvements (except tracks) under a general plan, considered as a whole, is less than \$200, the option may be exercised of charging the amount expended to . . . Operating Expenses."<sup>14</sup> And other public utilities may "exclude from equipment accounts hand and other portable tools which . . . . have relatively small value (\$10 or less) . . . ." <sup>15</sup> Naturally, no data are available concerning the amount of these charges, though they may be of some importance in the aggregate. When of sufficient importance to a business concern they would be accounted for on an inventory basis.

There is one industry, however, in which the practice of charging an important group of its capital expenditures to current expense is sufficiently general to be recognized and permitted by the tax authorities. These are development costs in mining. The figures in Table 10<sup>16</sup> relate only to that portion of development costs that is charged to current operations. This amount is affected by some duplication with the depletion charges presented earlier in this chapter. For the earlier years of the period covered it was impossible to exclude those development costs that were capitalized and later written off

<sup>14</sup> *Classification of Investment in Road and Equipment of Steam Roads Prescribed by the Interstate Commerce Commission, Issue of 1914*, p. 9.

<sup>15</sup> Federal Power Commission, *Uniform System of Accounts Prescribed for Public Utilities and Licensees, Effective January 1, 1937*, p. 48.

<sup>16</sup> Included are mines owned by corporations chiefly engaged in manufacturing, as well as strictly mining concerns. The industry, therefore, is broader in scope than the industry called mining in earlier sections of this chapter.

Table 10

Development Costs charged to Current Operations,  
1919-1935Mining and Quarrying (*Unit: \$1,000,000*)

1919	334	1923	328	1927	297	1931	109
1920	498	1924	292	1928	267	1932	107
1921	253	1925	319	1929	321	1933	96
1922	284	1926	366	1930	233	1934	138
						1935	184

through depletion (or depreciation) charges. But even if we allow generously for the possibility of duplication, development costs are still large. Over the period for which comparison is possible development costs (including any duplication) averaged about half of depletion charges. This ratio would be much higher for such industries as oil wells, if it were possible to compute it. Clearly, the treatment of development costs as well as the methods of computing depletion charges must be kept in mind when mining operations, as evaluated on the account books, are compared with those of other industries.

The kinds of fluctuation characterizing development costs can be determined only for the last decade, owing to the crude nature of the estimates for years prior to 1927. It is to be expected that development costs tend to fluctuate more than output, since they involve commitments with respect to an uncertain future. Recourse to the original data obtained from the income accounts of several large oil and gas companies confirms this hypothesis (development of oil and gas wells is responsible for most of the cost of developing mines, quarries and wells). In Table 11 the large fluctuations in development costs relative to those of gross income can be observed for 1927-35. Even after allowance for changing relative prices and for proration the relative decline in development operations during the depression remains.

## ENTRIES ARISING FROM RETIREMENTS OF FIXED ASSETS

In the preceding sections we have considered estimates based on data, recorded in business income accounts, that definitely

Table 11

## Intangible Development Costs as a Percentage of Oil and Gas Sales, 1927-1935

	NUMBER OF COMPANIES	PERCENTAGE		NUMBER OF COMPANIES	PERCENT.
1927	8	4.9	1931	17	1.9
1928	8	4.3	1932	17	1.9
1928	14	4.4	1933	15	1.8
1929	14	4.8	1933	15	1.6
1929	15	5.2	1933	15	1.6
1930	15	3.6	1934	15	1.7
1930	17	2.7	1934	14	1.9
1931	17	1.9	1935	14	2.5

SOURCE: Annual reports of large oil and natural gas mining companies

reflect current consumption of capital. Certain additional entries made in the fixed asset accounts are not always intended to reflect current capital consumption. Sometimes they are in the nature of adjustments relating to periods longer than the current fiscal period. These entries cover debit or credit balances revealed upon the retirement or abandonment of fixed assets. The losses are charged either to current income or to surplus, depending on the general accounting procedure and the amount.

Steam railways (and the available data refer to this industrial branch alone) include loss on retirement of equipment<sup>17</sup> in operating expenses. But when large enough to distort the annual statement these may be placed in a suspense account as 'delayed income debits'. The movements of the retirement and income-debit items are very erratic in comparison with those for depreciation and maintenance (Table 12). But cyclical swings stand out. Retirements were low in 1919-1921, reached a high in 1929, and then declined. An almost reverse pattern is found in delayed income debits. The decline in retirements beginning in 1930, for example, was more than made up by rises in delayed income debits.

<sup>17</sup> Retirements of ways and structures are not shown separately from repairs and other maintenance; see *Classification of Investment in Road and Equipment of Steam Roads Prescribed by the Interstate Commerce Commission, Issue of 1914*, p. 13.

Table 12

Entries arising from Retirement of Fixed Assets, 1919-1935  
Class I Steam Railways (Unit: \$1,000,000)

	RETIREMENTS	DELAYED INCOME DEBITS		RETIREMENTS	DELAYED INCOME DEBITS
1919	2.7	3.4	1929	39.7	7.4
1920	1.8	3.5	1930	18.5	37.6
1921	6.1	13.4	1931	7.2	65.6
1922	17.6	0.7	1932	14.7	28.4
1923	38.8	9.2	1933	15.3	42.8
1924	26.9	3.0	1934	5.1	60.9
1925	29.8	0.9	1935	1.9	1.2
1926	29.2	5.1			
1927	25.5	13.9			
1928	26.3	6.0			

Relative to other entries recording capital consumption in steam railways, those arising from the retirement of fixed assets are small. The annual average amounts in millions of dollars, for 1919-35, of each of these entries are as follows:

Depreciation	185.9
Maintenance charges	1,564.0
Insurance (property)	8.9
Retirements	18.1
Delayed income debits	17.8

Maintenance charges (other than depreciation and retirements) are of overwhelming weight in the records of steam railways. The next item in size, consisting of charges for depreciation (chiefly on equipment), averages only 11.6 per cent of maintenance charges. The sum of retirements and delayed income debits constitutes but 2 per cent of the total of all the entries listed above.<sup>18</sup>

<sup>18</sup> The reader's attention is called to Table 29 which contains a summary of certain of the measures presented in this chapter.

*Note:* SOURCES AND METHODS OF ESTIMATION

Notes on the method of estimation and sources of the figures presented in the text of Chapter 4 are presented below. Although brief, the explanations are in sufficient detail to make possible a fairly adequate judgment concerning the reliability of the various estimates. The reader should consider this Note an integral part of the chapter.

## DEPRECIATION AND DEPLETION

The basic materials were taken from corporate reports made for income tax purposes and compiled by the Statistical Unit of the Bureau of Internal Revenue in the Treasury Department (annual issues of *Statistics of Income*). The following steps in the derivation of the figures presented in Table 1 require discussion: (1) the method of estimating non-corporate depreciation and depletion; (2) the method of excluding depreciation on residences; (3) the estimation of depreciation for 1919-24.

*Non-corporate business property*

Depreciation and depletion of non-corporate enterprises were estimated by use of ratios of the value of the product of non-corporate to corporate enterprises. For some industries these data are not available and it is necessary to assume a ratio of unity. The details follow.

<i>Industrial group</i>	RATIO OF CORPORATE VALUE OF PRODUCT TO TOTAL VALUE OF PRODUCT		SOURCE
	1919	1929	
Mining <sup>19</sup>	.936	.957	Census of Mines and Quarries, 1919 and 1929, straight line interpolation for intervening years; 1930-35 assumed equal to 1929
Manufacturing			Total of subgroups below
Construction	.328	.549	National Bureau of Economic Research study of national income

<sup>19</sup> Also estimated by applying, to non-corporate value of production, the ratio of corporate depreciation and depletion to corporate sales. The difference between this estimate and the one used above is slight.

<i>Industrial group</i>	RATIO OF COR- PORATE VALUE OF PRODUCT TO TOTAL VALUE OF PRODUCT		SOURCE
	1919	1929	
Transportation and other public utilities <sup>20</sup>	1.000	1.000	Not stepped up: no data
Trade	.413	.639	National Bureau of Economic Re- search study of national income
Service	.644	.742	Census of Manufactures, 1919, 1929, for those service industries covered in it, straight line interpolation for other years; 1930-35 assumed equal to 1929
Finance and real estate	1.000	1.000	Not stepped up: no data; for real estate held by individuals, see be- low
Miscellaneous <sup>21</sup>	1.000	1.000	Not stepped up: no data
<i>Manufacturing sub- group</i>			
Food and tobacco	.837	.892	Census of Manufactures, 1919, 1929, interpolated by straight line; 1930- 35 taken equal to 1929
Textiles and leather	.761	.822	"
Lumber and stone, clay and glass	.838	.891	"
Paper	.939	.971	"
Printing and publish- ing	.800	.869	"
Chemicals	.958	.974	"
Metals	.962	.978	"
Misc. manufacturing	.881	.919	"

<sup>20</sup> Depreciation and depletion charges reported in *Statistics of Income* for the public utility group for 1919 were raised to allow for the omission from the published figures of approximately half the charges. The omission, noted in *Statistics of Income for 1919* (p. 8), resulted from the failure of many utilities to report their expenses in detail. Omissions for the same cause are mentioned in later volumes also (up to 1925), but corresponding corrections were not made owing to lack of information or because (for 1920) the correction suggested in *Statistics of Income* would have thrown the figure badly out of line and would have run counter to evidence available in other sources, such as *Statistics of Railways* and the Census of Electrical Industries.

<sup>21</sup> Including Forestry and Fishing, the 1932 and 1933 figures of which are taken from the special breakdown in Tables I and II, Appendix B; for earlier years figures were estimated on the basis of the 1932-33 ratio of this subgroup to the total in the entire group ('Agriculture and related industries'). For farming, see Ch. 6.

*Business real estate held by individuals*

Depreciation on real estate held by individuals, exclusive of residences, was estimated by a method similar to that used above, rents being substituted for value of product. Depreciation on residences owned by corporations is also excluded, being deducted from depreciation on non-residential real estate held by individuals. The details of the computation follow.

Rents and royalties received by individuals holding business property were estimated as follows for 1929-33:

- 1) Gross rent on business property paid to all landlords  
Based on rents paid as reported in the Census of Construction for 1929, Census of Trade for 1929, Department of Agriculture estimates for 1929-33, *Statistics of Income* for 1933, and rents received reported in *Statistics of Income* for 1929-33
- 2) Rents received by corporations  
*Statistics of Income* for 1929-33
- 3) Rents received by individuals  
Gross rent paid to all landlords, less rents received by corporations

This is a net figure: rents on houses paid to corporations have (in effect) been subtracted from rents on business buildings paid by corporations to individuals.

The ratios of depreciation charges to gross rents received, 1929-33, were based on the corresponding ratios for real estate corporations (unpublished breakdown of *Statistics of Income*). (This is too high by the amount of depreciation on non-rented property, which is probably slight.) The ratio thus derived, applied to rents received by individuals from business buildings, yields the 1929-33 figures.

Extrapolation back to 1919 was on the basis of depreciation reported by corporations in the real estate and finance group and the changing relation between rents received by individuals and rents received by realty corporations. The latter relation was estimated in the National Bureau study of national

income. Extrapolation forward to 1935 was on the basis of depreciation reported by realty corporations, assuming no change in the proportion of non-corporate to corporate property.

*Estimation of depreciation for 1919-1924*

Depreciation was derived from the difference between the sum of depreciation and depletion and an estimate of depletion. The latter was based on the application of a constant ratio (derived from the 1925-27 figures) of depletion to gross income for 1919-24. Owing to changes in tax laws and corporate practices, this is a doubtful procedure so far as depletion is concerned. Because of the differences in relative magnitudes, however, the estimate for depreciation may be accredited much more confidence. For this reason depreciation, but not depletion, is shown separately for 1919-24.

PROVISION FOR ACCIDENTAL LOSS

*Fire losses*

Total fire losses are estimated by the National Board of Fire Underwriters.<sup>22</sup> The value of property destroyed in fires is collected by the Board's Actuarial Bureau Committee and increased one-fourth for unreported and uninsured losses. A parallel series, compiled from insurance company records by the Spectator Company, is also available.<sup>23</sup> The differences between the two series are rather large in the later years of the period. Some differences are to be expected, of course, because of the inclusion of marine insurance business in the Spectator series, as well as insurance covering property in outlying territories and possessions of the United States.

The fire losses reported include losses on all types of property. Among them are consumers' goods such as furniture and clothing, and producers' goods such as stocks of raw and

<sup>22</sup> A convenient source of the figures is the *Statistical Abstract*, 1935, p. 276.

<sup>23</sup> *Statistical Abstract*, 1935, p. 275.

processed materials. If we are to measure the losses suffered on producers' durable goods (buildings and equipment) it is necessary to apply appropriate ratios to the total. In lieu of adequate information it was assumed that fire losses were in proportion to the value of property. Taking the latter from the 1922 estimate of national wealth (Federal Trade Commission), the amount of total fire losses was divided as follows:

	PERCENTAGE
Improvements to real estate	
Business	23.1
Residential	19.7
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	42.8
Capital equipment	16.3
Business stocks	18.4
Consumers' stocks	22.5
Total property subject to fire loss	100.0

Some scattered evidence available on the proportion of losses on buildings to total fire losses suggests that the ratio assumed, 42.8 per cent, may be somewhat of an understatement. For example: <sup>24</sup>

REGION	PERIOD	LOSS ON BUILDINGS AS A PERCENTAGE OF TOTAL LOSS
All cities over 30,000 population	1905	40.0
" " " " "	1907	39.3
" " " " "	1917	42.0
Boston	1926-28	50.6
Charleston	1919-30	56.5
New York City		
Manhattan, Bronx and Richmond	1928-34	46.8
Brooklyn and Queens	1928-34	48.0
Philadelphia	1935	35.0
Massachusetts	1934	66.8
Iowa	1935	63.2
Montana	1935	64.1
Oklahoma	1935	49.7
North Dakota	1934-35	69.2
Nebraska	1936	67.7
West Virginia	1935	70.8

There is insufficient basis, however, for a more refined esti-

<sup>24</sup> The data were obtained from *Financial Statistics of Cities* (Bureau of the Census), annual reports of various fire departments, and the National Fire Protection Association.

mate. It is assumed, of course, that the ratios used are constant over the entire period.

### *Marine wrecks and casualties*

The loss arising from damage to vessels due to "founderings, strandings, collisions and other causes" is given in Annual Reports of the Coast Guard. Vessels suffering a property loss of less than \$300 are omitted.

Table 4 covers the damage to vessels alone. Damage to cargoes is shown separately in the Coast Guard tabulation and is excluded.

### *Provision for fire and marine losses*

The losses estimated above were divided by the average ratio of losses incurred to net premiums earned, minus expenses, reported by members of the National Board of Fire Underwriters.<sup>25</sup> The ratio, for 1919-35, follows:

1919	.788	1929	.886
1920	1.064	1930	1.061
1921	1.032	1931	.997
1922	1.032	1932	1.010
1923	1.089	1933	.737
1924	1.116	1934	.751
1925	1.114	1935	.706
1926	1.060		
1927	.872		
1928	.867		

## MAINTENANCE AND REPAIRS

### *Public utilities*

*Steam railways.* The I.C.C. data in *Statistics of Railways* were compiled for maintenance charges other than depreciation, retirements, insurance, and injuries to persons, Class I steam railways. These were then stepped up, to include all steam

<sup>25</sup> Net losses incurred correspond more closely to actual losses than do net losses paid. For similar reasons, net premiums earned have been used, rather than net premiums written.

railways, on the basis of operating expenses (96.29 per cent in 1919, 96.86 per cent in 1933).

*Electric railways.* Basic data for 1917, 1922, 1927, and 1932 were obtained from the Census of Electrical Industries. They include railway operating expenditures on ways and structures, other than depreciation; on equipment, other than depreciation and retired equipment; on power maintenance, including expenditures on plant and grounds and one-half of wages of power employees. Interpolations for 1917-27 were made on the basis of total operating expenses as reported by the American Transit Association (*Transit Journal*, January 1934, p. 4); interpolations for 1927-35 were computed by use of maintenance figures (materials and labor) reported by the American Transit Association.

*Telephone companies.* Basic data for 1917 and 1922, covering repairs and maintenance, were taken from the Census of Electrical Industries. Interpolations for 1920-35 were based on 'current maintenance' of the Bell Telephone System. For 1919 the estimates were on the basis of number of telephone connections made.

*Electric light and power.* Basic data on maintenance expense for 1932 were obtained from the Census of Electrical Industries (commercial establishments); for 1929-35 the estimates are based on a sample, covering about 80 per cent of total revenues, collected from Moody's Public Utilities; for 1921-29, they are from the Edison Electric Institute. For 1919-20 the estimates are based on the ratio of maintenance expense to operating revenues in 1921; operating revenues for 1919-21 are estimates of the Edison Electric Institute.

*Telegraphs and ocean cables.* Data on maintenance (excluding depreciation) for 1929-31 are from reports to the Interstate Commerce Commission. Estimates for 1919-28 are based on the ratio of maintenance charges to operating revenues in 1929, applied to operating revenues as estimated from the Census of Electrical Industries for quinquennial years and Western Union for inter-censal years; for 1932-35, on main-

tenance charges of both Western Union and Postal Telegraph. *Manufactured gas.* Data on maintenance expense (excluding retirement expense) as a percentage of operating revenues, for 1929-35, were taken from the American Gas Association reports. Ratios for 1919-28 were assumed to be equal to that for 1929. These were applied to operating revenues for biennial years from the Census of Manufactures, interpolated by data from the American Gas Association.

*The Pullman Company.* Data on maintenance are from *Statistics of Railways* (I.C.C.) for 1922-34. For 1919-21 they were estimated by applying the ratio, in 1922, of maintenance to expenses other than those arising from conducting operations to these expenses in 1919-21.

*Express companies.* Data on repairs and maintenance (other than depreciation and retirements) for 1919, 1920, and 1933, 1934, and 1935 are from *Statistics of Express Companies* and *Statistics of Railways* (I.C.C.). Other years are estimated by the use of the ratio of maintenance to operating revenues of the Railway Express Agency, Inc.

*Natural gas.* The ratio of maintenance to operating revenues, derived for 1931-35 by the American Gas Association from a sample, was applied to the value of natural gas consumed (*Minerals Yearbook*). For 1919-30 the average ratio in 1931-35 was used.

*Water works (private).* Estimated by the Federal Employment Stabilization Board for 1930. The estimate for 1929-35 is based on a sample of companies (7 for 1929-32, 13 for 1932-35) collected from Moody's Public Utilities covering from 30 to 40 per cent of total maintenance. No estimate was made for 1919-28.

*Pipe lines.* Maintenance expenses for 1930 were estimated by the F.E.S.B. from I.C.C. returns. Estimates for 1920-35 were based on operating revenues (I.C.C.), and for 1919-20 on crude petroleum production.

*Industrial concerns*

The estimates of repairs and maintenance by industrial concerns for 1934 were based on a random sample of 477 listed corporations reporting to the Securities and Exchange Commission (Form 10). Movements for 1934-35 were estimated from a smaller sample of corporations reporting to the S.E.C. (Forms 10, 10K and A-2).

*Rented business real estate*

Estimates of business real estate maintenance were obtained by means of the ratio of maintenance costs to rents, applied to total rents paid on business property. The ratios were derived from data collected by the National Association of Building Owners and Managers relating to office buildings. The estimate of total rents on business is that mentioned earlier in this note.

## CAPITAL EXPENDITURES CHARGED TO INCOME

The basic data on development costs for mineral products other than petroleum and natural gas appear in the 1919 and 1929 *Census of Mines and Quarries*. Interpolations between 1919 and 1929 were made on the basis of the value of output, *Minerals Yearbook*. The ratios of development expense to the value of output for 1930-35 were assumed equal to that for 1929. For petroleum and natural gas (responsible for most development costs), figures for 1927-30 were derived from a study of petroleum costs made by the United States Tariff Commission,<sup>26</sup> and for 1919 from the *Census of Mines and Quarries*. No census data are available for 1929. Data for 1931-35 were based on the reports of large oil and gas producers (Table 11); those for 1920-26 were based on the number of oil wells completed, as compiled by the *Oil and Gas Reporter*, and construction costs (American Appraisal Co., all types).

<sup>26</sup> Report on Crude Petroleum, etc. (Report No. 30, 2d Series, U. S. Tariff Commission, 1932), pp. 155-7.

The 1927-30 figures for petroleum and gas exclude all development costs that were capitalized and amortized. The 1919 figures for petroleum, and both the 1919 and 1929 figures for other minerals, presumably include all expenditures on development.

#### ENTRIES ARISING FROM RETIREMENTS OF FIXED ASSETS

The data used are from *Statistics of Railways*. They relate to Class I railways (which report 97 per cent of the operating expenses of all steam railways) and include retirements of equipment (classified by the railways under maintenance) and delayed income debits (classified among surplus adjustments).

Owing to changes in accounting requirements effective January 1, 1935, 'retirements' for 1935 are not quite comparable with amounts in prior reports. Charges to this account in 1935 included only the cost of tearing down retired equipment and recovering the salvage therefrom, whereas retirement charges in preceding years included amounts necessary to adjust the difference between the ledger value (less salvage) of equipment retired from service and the amount of accrued depreciation charged on account of such retired equipment to the date of their retirement.<sup>27</sup>

<sup>27</sup> *Statistics of Railways, 1935*, p. 8-79.