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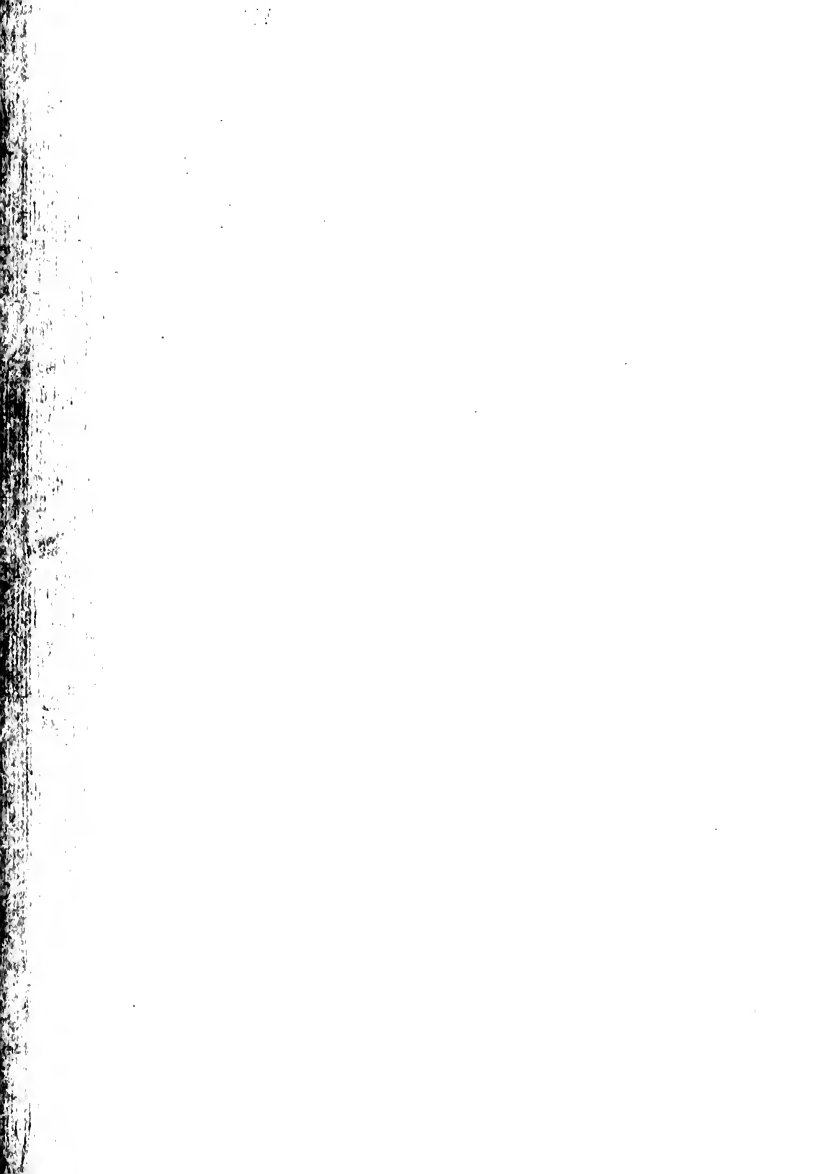


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NATIONAL RECOVERY ADMINISTRATION

DIVISION OF REVIEW

EVIDENCE STUDY

NO. 11

OF

THE ELECTRICAL MANUFACTURING INDUSTRY

Prepared by

J. R. PIKE

December, 1935

PRELIMINARY DRAFT

(NOT FOR RELEASE: FOR USE IN DIVISION ONLY)

THE EVIDENCE STUDY SERIES

The EVIDENCE STUDIES were originally planned as a means of gathering evidence bearing upon various legal issues which arose under the National Industrial Recovery Act.

These studies have value quite aside from the use for which they were originally intended. Accordingly, they are now made available for confidential use within the Division of Review, and for inclusion in Code Histories.

The full list of the Evidence Studies is as follows:

- | | |
|-------------------------------------|---|
| 1. Automobile Manufacturing Ind. | 23. Mason Contractors Industry |
| 2. Boot and Shoe Mfg. Ind. | 24. Men's Clothing Industry |
| 3. Bottled Soft Drink Ind. | 25. Motion Picture Industry |
| 4. Builders' Supplies Ind. | 26. Motor Bus Mfg. Industry (Dropped) |
| 5. Chemical Mfr. Ind. | 27. Needlework Ind. of Puerto Rico |
| 6. Cigar Mfr. Industry | 28. Painting & Paperhanging & Decorating |
| 7. Construction Industry | 29. Photo Engraving Industry |
| 8. Cotton Garment Industry | 30. Plumbing Contracting Industry |
| 9. Dress Mfg. Ind. | 31. Retail Food (See No. 43) |
| 10. Electrical Contracting Ind. | 32. Retail Lumber Industry |
| 11. Electrical Mfg. Ind. | 33. Retail Solid Fuel (Dropped) |
| 12. Fab. Metal Prod. Mfg., etc. | 34. Retail Trade Industry |
| 13. Fishery Industry | 35. Rubber Mfg. Ind. |
| 14. Furniture Mfr. Ind. | 36. Rubber Tire Mfg. Ind. |
| 15. General Contractors Ind. | 37. Silk Textile Ind. |
| 16. Graphic Arts Ind. | 38. Structural Clay Products Ind. |
| 17. Gray Iron Foundry Ind. | 39. Throwing Industry |
| 18. Hosiery Ind. | 40. Trucking Industry |
| 19. Infant's & Children's Wear Ind. | 41. Waste Materials Ind. |
| 20. Iron and Steel Ind. | 42. Wholesale & Retail Food Ind. (See No. 31) |
| 21. Leather | 43. Wholesale Fresh Fruit & Veg. |
| 22. Lumber & Timber Prod. Ind. | |

In addition to the studies brought to completion, certain materials have been assembled for other industries. These MATERIALS are included in the series and are also made available for confidential use within the Division of Review and for inclusion in Code Histories, as follows:

- | | |
|------------------------------------|---|
| 44. Wool Textile Industry | 49. Household Goods & Storage, etc. (Dropped) |
| 45. Automotive Parts & Equip. Ind. | 50. Motor Vehicle Retailing Trade Ind. |
| 46. Baking Industry | 51. Retail Tire & Battery Trade Ind. |
| 47. Canning Industry | 52. Ship & Boat Bldg. & Repairing Ind. |
| 48. Coat and Suit Ind. | 53. Wholesaling or Distributing Trade |

L. C. Marshall
Director, Division of Review

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THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 311

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to ensure the validity of the results.

3. The third part of the document describes the different types of data that are collected and how they are used to inform decision-making. It notes that a combination of quantitative and qualitative data is often used to provide a comprehensive view of the organization's performance.

4. The fourth part of the document discusses the challenges and limitations of data collection and analysis. It acknowledges that there are often obstacles to obtaining complete and accurate data, and that the analysis of this data can be a complex and time-consuming process.

5. The fifth part of the document provides a summary of the key findings and conclusions of the study. It reiterates the importance of data-driven decision-making and the need for ongoing monitoring and evaluation of the organization's performance.

6. The sixth part of the document offers recommendations for future research and practice. It suggests that further exploration of data collection methods and analysis techniques is needed to improve the effectiveness of data-driven decision-making.

7. The seventh part of the document concludes the report and expresses the author's appreciation for the support and assistance provided by the organization and its staff throughout the project.

8. The final part of the document includes a list of references and a list of appendices, providing additional information and resources for those interested in the topic.

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ELECTRICAL MANUFACTURING INDUSTRY

Foreword

The data contained in this Evidence Study have been obtained chiefly from the Census of Manufactures, the Bureau of Labor Statistics, and the former Code Authority for the Electrical Manufacturing Industry.

As explained in Chapter I, the Census classification for this Industry is not identical with the Code definition, but the Census data give a good general idea of the Industry as codified.

The Labor data in Table XVI (Chapter II), which were specially compiled by the Bureau of Labor Statistics in cooperation with the NIRA, Research and Planning Division, and most of the tables based on information supplied by the former Code Authority, pertain to the Industry as defined by the Code.

Because of the small amount of data available in connection with the section on raw materials, this section has been included in Chapter II.

Chapter I

THE INDUSTRY

Definitions of the Industry

The Electrical Manufacturing Industry is defined in the Code of Fair Competition for the Industry

"..... to mean the manufacture for sale of electrical apparatus, appliances, material or supplies and such other electrical or allied products as are natural affiliates."

In the Census of Manufactures, the "Electrical Machinery, Apparatus, and Supplies" Industry is only roughly comparable with the Code Industry in scope. The Census classification does not cover establishments whose principal products are "electric lighting fixtures, electric signs, or motor driven tools, mechanical refrigerators, washing machines and other machines and appliances constructed with built-in motors." On the other hand, the Census data include establishments covered by codes other than that for the Electrical Manufacturing Industry, although approximately 85-90 per cent of the products in the Census classification in 1929 were covered by the Code. The usual limitation arising from the fact that the Census data do not include establishments having an annual production of less than \$5,000 must also be borne in mind.

History and Development

The Industry got its start in the latter part of the Nineteenth Century. Originally used primarily for telegraph and telephone communication, illumination, and electric transportation, electricity now plays a vital part in practically all of the activities of modern civilization. Each new use for electricity requires not only additional generating and distributing equipment resulting from the increased demand, but also additional electrical equipment and energy for use in the factories making the new electrical product. The growth of the Industry is indicated by the increased output of electrical energy. According to Table I, this has increased from less than 200 million kilowatt hours in 1887 to more than 80 billion in 1935, a four hundred-fold increase.

TABLE I

Electrical Energy Produced in Central Stations,
for Selected Years, 1887-1933
(In millions of kilowatt-hours)

Year	Output of Electrical Energy
1887	175
1897	800
1907	5,900
1917	25,400
1927	74,700
1929	91,400
1933	80,100 ^{a/}

Source: Electrical World, January 6, 1934.

^{a/} Estimated on basis of 10 months' operations.

Competition with Other Industries

Competition with other industries is almost entirely limited to gas-operated devices, such as domestic refrigerators, cooking stoves, water heaters, industrial furnaces and ovens, and various small household appliances such as percolators and heaters.

Manufacturing Operations

The industry is so diversified that the manufacturing operations embrace practically all of the modern processes for working materials, and in many subdivisions of the industry special manufacturing processes have been developed to meet problems that are peculiar to these subdivisions.

Total Number of Establishments

Although the data presented in Table II are not strictly comparable from year to year (see table footnotes) it may be stated that there has been a marked decline in the number of establishments from 1929 to 1933 with a slight increase in 1935.

Number of Establishments by Principal States

In 1933 about 60 per cent, and in 1935 over 75 per cent, of the total establishments were located in the eight states listed. The states having the largest number of establishments in 1935 were New York, Illinois, and Ohio in the order named.

TABLE II

Number of Establishments, by Principal States

State	1929	1931	1933	1935 ^{a/}
U. S. Total	1,903	1,583	1,853	1,411
Connecticut	59	58	53	66
Illinois	245	221	181	197
Indiana	57	44	37	34
Massachusetts	106	102	84	89
New Jersey	151	150	99	114
New York	287	268	213	274
Ohio	211	198	160	193
Pennsylvania	137	130	118	136
All Others	549	475	408	335

Source: Census of Manufactures, "Electrical Machinery, Apparatus and Supplies," for 1929, 1931, and 1933, and, in addition, "Radio Apparatus and Phonographs" for 1931 and 1933; Code Authority for 1935. Data for 1929 are not exactly comparable with 1931 and 1933 since phonographs are included in Census data for the latter two years; and since the Census and Code coverages are not identical, the 1935 data supplied by the Code Authority are not strictly comparable with those for the previous years. Census data do not include establishments having an annual production of less than \$5,000.

^{a/} As of January, 1935.

Size of Establishment

By Value of Product. - Over 60 per cent of the dollar volume of the Industry in 1929 was turned out by the 81 plants having an annual production valued at more than \$5,000,000. These plants constituted less than 5 per cent of all establishments. (See Table III.)

TABLE III

Number of Establishments and Value of Product, Classified
by Value of Product per Establishment, 1929

Value of Product per Establishment	Establishments		Value of Product	
	Number	Per Cent of Total	Amount (Thousands)	Per Cent of Total
All Establishments	1,802	100.0	\$2,300,916	100.0
\$5,000 to \$19,999	264	14.7	3,384	0.2
20,000 to 49,999	262	14.5	8,552	0.4
50,000 to 99,999	234	13.0	16,846	0.7
100,000 to 249,999	322	17.9	52,304	2.3
250,000 to 449,999	200	11.1	69,657	3.0
500,000 to 999,999	180	10.0	131,760	5.7
1,000,000 to 2,499,999	171	9.5	270,968	11.8
2,500,000 to 4,999,999	88	4.9	335,670	14.6
5,000,000 and over	81	4.5	1,411,776	61.4

Source: Census of Manufactures, 1929, "Electrical Machinery, Apparatus, and Supplies." Census data do not cover establishments having an annual production of less than \$5,000.

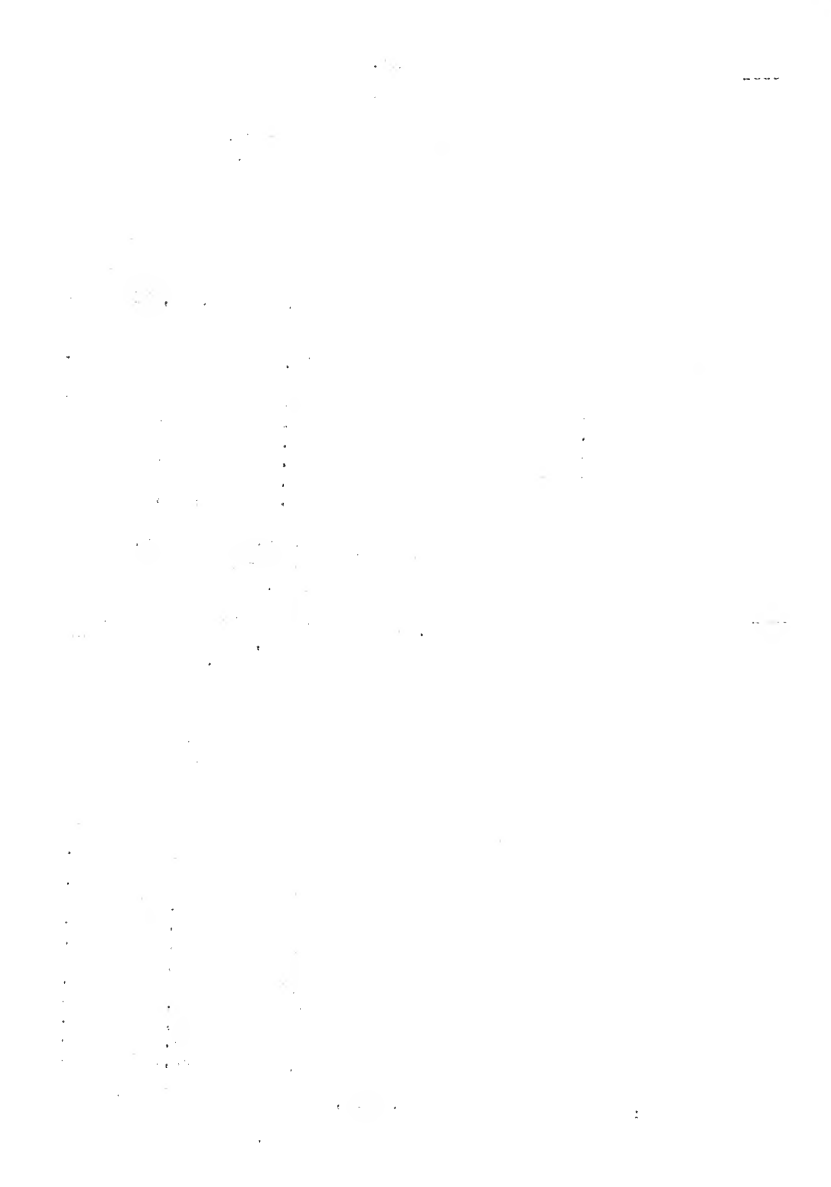
By Number of Wage Earners. -- On the basis of wage earners, 3 per cent of the establishments -- those employing over 1,000 wage earners -- accounted for 57 per cent of the total number employed in 1929. (See Table IV.)

TABLE IV

Number of Establishments and Number of Wage Earners, Classified by
Number of Wage Earners per Establishment, 1929

Number of Wage Earners per Establishment	Establishments		Wage Earners	
	Number	Per Cent of Total	Number	Per Cent of Total
All Establishments	1,802	100.0	328,722	100.0
No Wage Earners	5	0.3	0	0.0
1 - 5	418	23.2	1,496	0.5
6 - 20	486	27.0	5,710	1.7
21 - 50	267	14.8	8,994	2.8
51 - 100	184	10.2	13,269	4.1
101 - 250	224	12.4	34,789	10.6
251 - 500	109	6.1	38,834	11.8
501 - 1,000	53	2.9	36,928	11.3
1,001 - 2,500	37	2.0	54,945	16.5
2,501 and more	19	1.1	133,757	40.7

Source: Census of Manufactures, 1929, "Electrical Machinery, Apparatus, and Supplies." Census data do not include establishments having an annual production of less than \$5,000.



Capital Investment

The capital investment of the Industry has been estimated by the National Electrical Manufacturers Association at from \$1,000,000,000 to \$1,250,000,000 in 1929, and from \$900,000,000 to \$1,150,000,000 in 1933. The estimate is based on reports from 125 companies which account for about two-thirds of the Industry's sales and from 75 to 80 per cent of the total number of employees.

Net Profit or Loss

The net profit or loss of the Industry is estimated by the National Electrical Manufacturers' Association to be as follows:

1929	\$159,072,571
1932	- 25,987,048 (loss)
1933	- 13,432,046 (loss)

The estimate is based on reports of 125 companies who reported sales amounting to \$425,963,000 for 1933, and 140,000 employees, in September, 1933.

Value of Production by Principal Product Groups

The value of production of the Industry as reported by the Census of Manufactures is given by principal product groups in Table V. These figures show the decline of business in all sub-divisions of the Industry from 1929 through 1933. The most marked decline took place in the products used for industrial equipment.

TABLE V

Total Value of Product by Principal Product Groups,
(in thousands)

Product Group	1929	1931	1933
Total	\$2,634,246	\$1,173,393	\$615,307
Conduits	53,270	32,835	18,323
Household Apparatus and Appliances	84,485	55,573	35,723
Insulated Wire and Cable	312,592	120,799	61,225
Lamps, Incandescent Filament	85,320	70,503	49,274
Motors	194,846	95,003	55,703
Radio Apparatus and Supplies	411,637	184,750	109,144
Switch Boards, Circuit Breakers, and Switches	81,201	44,832	14,499
Transformers and Circuit - Limiting Reactors	77,825	42,742	14,853
Generators	80,932	34,438	16,298
Wiring Devices	---	a/	16,465
Control Apparatus	---	a/	14,853
All Others	949,138	490,923	208,931

Source: Census of Manufactures; see source to Table II, above, for further details regarding Census data.

a/ Included in "All Others."

Estimated Total Sales, by Principal Types of Product

In Table VI are shown estimates of sales of all products under the Code as prepared by the Code Authority from Census data. Although the items are grouped differently, this table indicates the same general decline shown in Table V. Domestic sales, as shown in Table VII for the years 1933 and 1934, increased from \$592,000,000 in the former year to \$736,000,000 in 1934.

TABLE VI

Estimated Total Sales by Principal Type of Product
(In thousands)

Type	1929	1931	1933
Total	\$2,401,000	\$1,235,000	\$650,000
Refrigeration	136,000	128,000	89,000
Radio	412,000	163,000	100,000
Appliances	66,000	43,000	25,000 ^{a/}
Incandescent Lamps	81,000	68,000	48,000 ^{a/}
Insulated Wire and Cable	313,000	120,000	61,000 ^{a/}
Motors and Generators	265,000	125,000	66,000
Telephone and Telegraph	166,000	113,000	22,000
Electrical Supply	314,000	177,000	77,000 ^{a/}
All Other	645,000	298,000	162,000

Source: Code Authority for the Electrical Manufacturing Industry.

^{a/} It will be seen that this figure for total sales is smaller than the figure reported by the Code Authority (Table VII) for domestic sales.

TABLE VII

Estimated Total Domestic Sales, by Principal
Type of Product, 1933 and 1934
(In thousands)

Type	1933	1934
Total	\$598,408	\$765,538
Refrigeration	75,544	107,858
Radio	87,245	102,025
Appliances	29,529	45,290
Incandescent Lamps	53,916	59,534
Insulated Wire and Cable	63,000	84,341
Motors and Generators	61,624	73,463
Telephone and Telegraph	3,261	5,089
Electrical Supply	81,380	109,089
All Other	142,909	178,849

Source: Code Authority for the Electrical Manufacturing Industry.

Chapter II

LABOR AND MATERIALS

Total Annual Employment

A decline of more than 50 per cent was registered between 1929 and 1933 in both total employment and in number of wage earners, according to estimates by the Code Authority. About one-fourth of this loss was recovered by 1934. Table VIII presents data for the years 1929, 1931, 1933, and 1934.

TABLE VIII

Estimated Total Annual Number of All Employees,
and of Wage Earners

Year	All Employees	Wage Earners
1929	410,000	338,000
1931	265,000	213,000
1933	200,000	155,000
1934	250,000	200,000

Source: Code Authority for the Electrical
Manufacturing Industry.

Number of Wage Earners by Principal States

The number of wage earners in the leading states in the years 1929, 1931, and 1933 is shown in Table IX. The same concentration in the Northeastern States is indicated as in Tables II, above, and XIX, below. In 1933, over 80 per cent of all wage earners were reported in the eight states listed. Pennsylvania had the highest number, with Ohio, New York and Illinois following in the order mentioned.

TABLE IX

Annual Average Number of Wage Earners,
by Principal States

State	1929	1931	1933
U. S. Total	328,722	216,596	163,201
Connecticut	15,235	10,927	9,627
Illinois	57,347	34,647	19,174
Indiana	20,757	13,907	12,072 a/
Massachusetts	28,844	20,055	14,285
New Jersey	42,193	28,455	12,514 a/
New York	43,979	27,844	19,272
Ohio	36,267	22,972	21,243
Pennsylvania	47,373	32,814	24,812
All Others	36,737	24,975	30,402 b/

Source: Census of Manufactures; see source to Table II, above, for further details regarding Census data.

a/ Data on "Radios and Phonographs" not included.

b/ Includes the wage earners in "Radios and Phonographs" omitted for Indiana and New Jersey.

Data showing the number of "processing employees," i. e., those engaged in direct labor, who constitute about 70 per cent of all employees in the Industry, are presented in Table X for leading states in 1934 and 1935. Although the states do not rank in quite the same order as that shown for all employees in the year 1935, the proportion accounted for by the eight leading states is about the same.

TABLE X
Processing Employees, by Principal States,
1934 and 1935

State	1934	1935 <u>a/</u>
U. S. Total	172,114	175,177
Connecticut	8,506	8,057
Illinois	18,157	18,480
Indiana	8,599	8,752
Massachusetts	17,369	13,007
New Jersey	20,451	20,815
New York	21,250	21,628
Ohio	26,012	26,475
Pennsylvania	25,258	25,703
All Others	30,512	31,055

Source: Code Authority for the Electrical Manufacturing Industry.
a/ As of January, 1935.

Total Annual Payrolls

Code Authority estimates of total payrolls of all employees and of wage earners for 1929-1934 are presented in Table XI. In both cases the drop from 1929 to 1933 was more than two-thirds of the 1929 total. The increase reported in 1934 was slightly more marked for wage earners than for all employees.

TABLE XI
Estimated Total Annual Payrolls of All Employees,
and of Wage Earners
(In thousands)

Year	All Employees	Wage Earners
1929	\$620,000	\$471,000
1931	320,000	242,000
1933	183,000	137,000
1934	235,000	195,000

Source: Code Authority for Electrical Manufacturing Industry.

Annual Wages by Principal States

Total wages paid are shown for the eight leading states for 1929, 1931, and 1933 in Table XII. The relative positions of the states changed during the depression: Illinois and Pennsylvania ranked first and second, respectively, in 1929 and 1931, but by 1933 Pennsylvania was first and Illinois second.

TABLE XII
Total Annual Wages, by Principal States
(In thousands)

State	1929	1931	1933
U. S. Total	\$456,378	\$259,634	\$144,948
Connecticut	17,732	10,963	7,427
Illinois	95,441	41,782	18,805
Indiana	25,783	14,474	11,090 <u>a/</u>
Massachusetts	41,012	22,752	13,263
New Jersey	54,639	32,735	11,423 <u>a/</u>
New York	63,718	31,155	16,994
Ohio	46,170	24,564	18,555
Pennsylvania	67,734	36,210	21,032
All Others	44,149	24,999	26,359 <u>b/</u>

Source: Census of Manufactures; see source to Table II, above, for further details regarding Census data.

a/ Data on "Radios and Phonographs" not included.

b/ Includes the wages in "Radios and Phonographs" omitted for Indiana and New Jersey.

Hourly Wages

Hourly rates in the industry were slightly higher in 1934 than in 1929, according to two separate sources -- the National Industrial Conference Board and the Code Authority. Very little change is indicated in hourly rates during the depression; the large drop in payrolls is apparently to be accounted for rather by the reduction in employment and the prevalence of part-time work. Hourly wages, as reported by the two sources, are shown below:

TABLE XIII
Average Hourly Wages (Cents per hour)

Year	As Reported by	
	National Industrial Conference Board	Code Authority
1929	62.5	56.0
1931	63.2	57.0
1933	57.1	51.0
1934	64.4	57.0

Source: National Industrial Conference Board, Service Letter; and Code Authority for Electrical Manufacturing Industry.

Weekly Hours

As shown in Table XIV, average hours worked per week declined nearly one-third from 1929 to 1934.

TABLE XIV
Average Hours Worked per Week

Year	Average Hours Per Week
1929	47.5
1931	39.0
1933	38.5
1934	32.4

Source: Code Authority for the Electrical Manufacturing Industry.

Weekly Earnings

Although average weekly earnings declined from \$26.80 in 1929 to \$18.75 in 1934, the 1931 average was slightly greater than in 1933, as indicated in the following table.

TABLE XV
Average Weekly Earnings

Year	Weekly Earnings
1929	\$26.80
1931	21.50
1933	17.25
1934	16.75

Source: Code Authority for the Electrical Manufacturing Industry.

Employment, Hours, and Earnings Under the Code

In addition to the annual data already given, monthly labor data for 1933 and 1934 are presented in Table XVI, from which to judge the effect of the Code in this field. These data, which were compiled by the Bureau of Labor Statistics in cooperation with the NRA, Research and Planning Division, pertain to the Industry as defined by the Code. The average employment for 1934 and total man-hours are shown to have increased 26 per cent over 1933, while payrolls increased 39 per cent. During 1934 there was a slight upward change in the average hours worked per week, compared with the decrease shown by the Code Authority figures in Table XIV, above. Average hourly wages increased from 55.1 to 58.6 cents, which is a somewhat smaller increase than that reported by the National Industrial Conference Board and the Code Authority in Table XIII, above. The increase in average weekly earnings of 60 cents was considerably less than that reported by the Code Authority, but the figures for both 1933 and 1934 were higher than the Code Authority's. To what extent these changes are directly due to the Code rather than other factors affecting the business situation in the latter part of 1933, and in 1934, cannot, of course, be stated.

TABLE XVI

Factory Employment, Payrolls, Hours and Wages, 1933-1934 ^{a/}

Month ^{b/}	Indexes, 1933=100			Average Hours Worked Per Week	Wages	
	Employ- ment ^{c/}	Pay- rolls ^{c/}	Man- Hours ^{d/}		Average Hourly ^{e/}	Average Weekly ^{e/}
1933						
January	81.7	77.0	71.8	29.7	58.94	\$19.20
February	82.0	79.9	76.8	31.7	55.4	19.60
March	80.7	75.6	71.6	30.0	56.5	18.72
April	82.0	78.0	73.6	32.8	54.0	18.97
May	86.8	84.8	81.4	35.6	52.6	19.42
June	91.9	92.2	102.2	37.6	50.8	19.93
July	96.7	95.9	105.0	36.7	51.4	18.68
August	105.7	107.8	111.2	35.6	54.8	19.27
September	116.5	117.2	114.7	33.3	56.3	19.85
October	126.4	122.1	122.6	34.7	57.3	20.77
November	129.0	124.6	128.6	34.0	56.8	20.66
December	121.6	125.9	117.6	32.7	56.3	19.18
Average	100.0	100.0	100.0	33.7	55.1	19.53
1934						
January	113.9	112.0	108.1	32.1	56.8	18.34
February	114.1	115.4	110.6	32.8	56.9	18.60
March	118.6	123.2	117.5	33.5	56.8	19.15
April	123.3	123.5	123.6	33.9	57.7	19.90
May	126.6	142.4	129.5	34.6	58.7	20.69
June	129.2	148.1	133.0	34.8	59.5	20.94
July	129.9	144.2	128.4	33.7	59.7	20.37
August	130.3	147.8	132.2	34.3	59.8	20.68
September	131.8	145.3	129.0	33.1	59.0	20.05
October	131.6	151.3	135.8	34.9	59.2	20.90
November	130.3	148.1	132.1	34.3	59.7	20.60
December	129.2	152.6	133.7	35.0	59.8	21.37
Average	125.7	138.7	126.1	33.9	58.6	20.13

Source: Unpublished data secured by the Bureau of Labor Statistics in cooperation with the Division of Research and Planning, N.R.A.

- ^{a/} Reporting establishments considered to be almost completely covered by the Electrical Manufacturing Code.
- ^{b/} Figures reported were for the payroll period nearest the 15th of the month.
- ^{c/} Based upon a representative sample covering an average of 234 establishments and nearly 98,250 employees in 1933. The sample was somewhat larger in 1934.
- ^{d/} Computed; Index of employment times average hours worked per week reduced to 1933=100.
- ^{e/} Based upon a representative sample covering an average of 153 establishments and nearly 61,000 employees in 1933. The sample was somewhat larger in 1934.



Labor Cost

The proportion of which annual wages are of the total value of product increased from 11.6 per cent in 1929 to 23.6 per cent in 1933. Table XVII presents the data as derived from the Census of Manufactures.

TABLE XVII

Relation of Labor Cost to Total Value of Product

Year	Total Value of Product (thousands)	Total Annual Wages	
		Amount (thousands)	Per Cent of Total Value
1929	\$2,334,246	\$456,378	19.6
1931	1,172,393	239,634	20.4
1933	615,307	144,948	23.6

Source: Census of Manufactures; see source to Table II, above, for details regarding Census data.

Materials Used

The Electrical Manufacturing Industry uses practically every known material in the manufacture of its products. The principal materials used are copper, iron, steel, paints and other covering materials, porcelain, and plastics.

Cost of Materials

As shown in Table XVIII the percentage which the cost of materials, including fuel and electrical energy, is of the total value of product declined somewhat from 1929 to 1931, and then increased to 1933.

TABLE XVIII

Relation of Cost of Materials to Total Value of Product

Year	Total Value of Product (thousands)	Cost of Material	
		Amount (thousands)	Per Cent of Total
1929	\$2,334,246	\$971,017	41.6
1931	1,172,393	425,527	36.3
1933	615,307	270,043	43.9

Source: Census of Manufactures; see source to Table II, above, for details regarding Census data.

Chapter III

PRODUCTION AND DISTRIBUTION

Value of Production by Principal States

Table XIX shows that the eight states listed accounted for over 80 per cent of the total value of production in 1933, although, as shown in table II, above, they accounted for only 60 per cent of the total establishments in that year. Ohio was the most important state in 1933, although up until that time it had been outranked by other states.

TABLE XIX

Value of Production, by Principal States
(In thousands)

State	1929	1931	1933
U. S. Total	\$2,300,917	\$1,188,153	\$668,257
Connecticut	86,854	46,579	31,453
Illinois	475,022	204,644	78,795
Indiana	122,257	72,725	50,380 ^{a/}
Massachusetts	184,787	104,326	52,628
New Jersey	292,786	145,663	61,299 ^{a/}
New York	280,139	124,081	74,126
Ohio	264,360	144,191	107,151
Pennsylvania	347,141	184,628	91,095
All Others	276,435	160,256	121,338 ^{b/}

Source: Census of Manufactures; see source to Table II, above, for details regarding Census data.

^{a/} Does not include production of "Radios and Phonographs."

^{b/} Includes "Radios and Phonographs" omitted for Indiana and New Jersey.

Distribution of Manufacturers' Sales

The distribution of sales in the Industry for the year 1929 as reported by manufacturing plants to the Bureau of the Census is presented in Table XX. Sales to wholesale dealers and to industrial consumers constituted 70 per cent of the total.

TABLE XX

Distribution of Sales of Manufacturing Plants, 1929

	Selling Value (F.O.B. factory)	Per Cent of Sales	Number of Plants	
			Total	Selling Exclusively as indicated
Total	\$2,230,361,000	100.0	1,774 ^{a/}	---
Sales to manufacturers' own wholesale branches	464,148,000	20.8	216	73
Sales to manufacturers' own retail branches	67,762,000	3.0	49	---
Sales to dealers:				
Wholesalers	700,333,000	31.4	963	370
Retailers	131,033,000	5.9	517	94
Sales to consumers:				
Industrial (manufacturers, power companies, rail- roads, etc.)	859,957,000	38.6	857	381
Household	7,128,000	0.3	22	46

Source: Bureau of the Census, Distribution of Sales of Manufacturing Plants, 1929.

a/ The total number of manufacturing plants engaged primarily in making electrical machinery and apparatus is 1,802. Of these, 20 do only contract work, and 6 transfer their entire output to other plants of the same company. Inasmuch as some of the other 1,776 plants sell to more than one type of customer, this figure is less than the total of the figures shown below it.

Wholesale Sales

The number of "electrical" wholesale establishments and the value of net sales made by them in each of ten leading states is given in Table XXI. These figures indicate that more than one-fourth of these establishments were located in the states shown in 1929 and in 1933, and that approximately the same proportion of total net sales were made in these states. New York is, of course, by far the most important state, both as to number of establishments and net sales, in each of the years shown.

In using these data it must be borne in mind that they do not cover all sales of electrical goods but only those reported by the Census in the group labeled "electrical" wholesale establishments, and that not all of these sales as reported are necessarily confined to electrical goods.

TABLE XXI

Number of "Electrical" Wholesale Establishments and Value of Net Sales Reported by them, by Principal States, 1929 and 1933 ^{a/}

State	Number of Establishments		Net Sales (000's)	
	1929	1933	1929	1933
U. S. Total	3,370	2,232	\$2,435,149	\$705,411
California	392	334	175,245	47,535
Illinois	319	269	294,329	62,244
Massachusetts	186	176	109,122	41,579
Michigan	169	155	111,877	40,558
Missouri	174	123	93,763	24,794
New York	711	565	556,955	132,934
Ohio	264	251	211,813	60,312
Pennsylvania	380	279	221,631	86,930
Texas	106	98	57,953	14,855
Washington	98	68	36,752	7,037
All Others	1,071	914	565,631	186,405

Source: Census of Wholesale Distribution, 1929, and Census of American Business, 1933, Wholesale Distribution, U. S. Summary and State Reports. The 1933 data do not include establishments having annual sales of less than \$1,000.

^{a/} "Electrical" wholesale establishments are here defined to include those the major part of whose sales are electrical goods and appliances, electrical equipment and supplies, radios and radio equipment, and electric refrigerators.

Exports

According to Table XXII, exports declined in 1933 to about one-third their 1929 value, but by 1934 had risen to about one-half the 1929 level.

TABLE XXII
Value of Exports

Year	Amount
1929	\$130,062,818
1931	85,080,455
1933	43,580,279
1934	66,524,900

Source: Bureau of Foreign and Domestic Commerce, Monthly Summary of Foreign Commerce.

Advertising Media

The nature of the advertising media varies with the different products of the industry. Many domestic appliances, for example, are advertised extensively by the use of the radio, national magazines, sign boards and newspapers. Other products are advertised only in trade journals or technical magazines. Table XXIII shows the dollar-volume of radio and magazine advertising used in the past few years by the radio manufacturers.

TABLE XXIII

Advertising Expenditures of Radio Manufacturers for Radio
Broadcasting and Magazine Advertisements ^{a/}

Year	Radio Broadcasting	Magazine Advertisements
1929	\$3,732,000	\$5,618,000
1931	910,000	2,754,000
1933	568,000	1,296,000
1934	656,000	1,531,000

Source: Prepared from data published in Bureau of Foreign and Domestic Commerce, Survey of Current Business, as compiled by Denney Publishing Company, Inc.

^{a/} Radio data are for the National Broadcasting Company and the Columbia Broadcasting System and include only national advertising; magazine data represent the cost of advertising of radio manufacturers in all classes of national magazines.

Chapter IV
TRADE PRACTICES

The various unfair trade practices of certain members of the Industry have been outlined by Mr. A. L. Kress, formerly Code Administration Director of the National Electrical Manufacturers' Association. Below are excerpts from a letter to the NRE, dated June 4, 1935:

"It is believed that the following unfair trade practices have, and in some cases still do avail in the industry. It is of course impossible to appraise their extent or magnitude.

A - Selling Below Cost:

"This being one of the provisions incorporated in the basic code, it is reasonable to assume that selling below cost must have been widely prevalent in the industry prior to the approval of the code. This industry was probably no different from other industries. That was the impression when the whole question of selling below cost became such a debated topic in any discussions of the elimination of unfair trade practices.

B - Terms and Conditions of Sale:

"The following practices having to do with terms and conditions of sale all apparently have existed in some degree as evidenced by the frequently expressed desire to incorporate provisions in supplemental codes dealing with them.

- (1) Giving of excessive cash discounts.
- (2) The granting of excessive preferred terms of payment which were uneconomic, inconsistent with prevailing commercial terms, and which were obviously intended as a method of reducing the price itself.
- (3) The granting of excessive trade discounts not warranted by the cost of doing business and the services rendered in return.
- (4) The giving of excessive trade-in allowances on certain products, not warranted by the scrap or resale value of the product traded in, and which were obviously intended as a method of price cutting.
- (5) The practice of making lump sum bids on certain products, where the sub-total was less than the total for the individual items, where such reductions were not warranted by the quantity purchased, and again where the intent was to offer an unbalanced bid or to cut prices.

- (6) The offer or giving of cash allowances or contributions towards the payment of advertising of customers, where such allowances or contributions were not warranted by the value received and which, in effect, served to improperly reduce prices.

C - Selling Methods:

"The following practices having to do with selling all a apparently have existed in some degree as evidenced by the frequently expressed desire to incorporate provisions in supplemental codes dealing with them -

- (1) The splitting of commissions by salesmen, particularly in the case of sales to municipalities.
- (2) The acceptance of returned goods under conditions not warranted by any legal or moral responsibility incurred by the manufacturer.
- (3) The giving of secret rebates.
- (4) The policy of individual or multiple prices which in effect constitute a discrimination against customers of the same class through the granting of special concessions. Such special concessions were of course usually known only to the parties involved.
- (5) The use of consignment methods or ledger balances, where such methods were used primarily to exclude competitors from certain areas.
- (6) Improperly influencing the actions of employees or representatives of customers or potential customers through gifts or otherwise.
- (7) The use of advertising which misled or was designed to mislead potential customers.
- (8) The acceptance of blanket or requirement orders at prices not warranted by the size of the individual shipments made.
- (9) Substitution of material in the case of competitive bids not equal to that required in the specifications themselves, which constituted misrepresentation.
- (10) The improper rental of equipment on terms which in effect simply evaded the price at which such equipment should have been sold.
- (11) The giving of free service or the placing of equipment on trial or the unwarranted furnishing of samples, all done with the intent of indirectly reducing the price at which such equipment should have been sold.

- (12) The making of long term contracts which did not provide for price adjustment in order to reflect changes in cost.
- (13) The guaranteeing against price declines without a corresponding provision guaranteeing to the manufacturer an adjustment in case of price increase.
- (14) The use of an unsound warranty provision.

D - Relations with Competitors:

- (1) The defamation of competitors and products.
- (2) The making of derogatory statements with regard to competitors and their policies.

E - Policy with respect to Products:

- (1) The marketing of products which fail to conform with recognized standards of safety.
- (2) The marketing of products which fail to conform to accepted ratings and performance requirements.
- (3) The misbranding of products with intent to deceive customers or potential customers.
- (4) The misrepresentation of products with regard to the quality, characteristics or performance.
- (5) The imitation of competitors' trade marks for the purpose of misleading customers or potential customers.
- (6) The selling of firsts as seconds, or seconds as firsts, with the intent either to cut prices or mislead customers.

"The above lists should be understood as neither exhaustive nor as implying that all these practices have existed in all branches of the industry at the same time."

Chapter V

THE INDUSTRY - GENERAL INFORMATION

Trade Associations

The National Electrical Manufacturers' Association is the dominant trade association in this industry. It was formed in 1916 by the merger of three then existing associations; namely, Electrical Manufacturers' Council, formed in 1905; Electric Power Club, formed in 1906; and Associated Manufacturers of Electrical Supplies, formed in 1915. Its membership includes over 500 companies, representing practically the entire field of electrical manufacture. It is estimated by the Association that its members produce 85 per cent of the production of the entire industry. The Association was designated in the Code as the "agency for administering, supervising and promoting the performance of the provisions of the Code by the members of the Electrical Manufacturing Industry." In addition to its former Code activities, the staff of the Association renders the membership many other services.

There are a few smaller trade associations that cover only certain product groups, such as Radio Manufacturers' Association, Electric Porcelain Manufacturers' Association, National Lamp and Saege Manufacturers' Association, and Incandescent Lamp Manufacturers' Association.

Labor Organization

Mr. Avery Leiserson, of the NRE Labor Advisory Board Staff, has prepared the following statement on labor organization in the Electrical Manufacturing Industry:

"The recognized trade unions claiming jurisdiction in this industry are: the electric workers, the machinists, the molders, pattern makers and metal polishers. The federal unions have experienced a considerable growth in numbers under the NRE, particularly in the radio division of the industry. The latter organizations are local unions attached directly to the American Federation of Labor, rather than local chapters of a national craft organization. Federal unions are not restricted to members of one craft or closely allied crafts in an amalgamation, but cover the entire plant from top to bottom. As yet, they have not begun to spread over entire industries, but confine themselves to one plant of one company. Many people in the labor movement believe that a combination of the local unions into a national organization on a vertical basis is imminent.

"It is exceedingly difficult to quote any exact figures of union membership. Representation was claimed at the first public hearing on the Electrical Code for something less than 10,000 workers in the five crafts mentioned above -- i.e., that was the number in the unions who had jobs and were under union agreements. Of course, that was not the only basis of representation. With the growth of union membership under the Act and the success of organizing several local federal unions, a much greater number of workers may be said to be directly affiliated with the American Federation of Labor. This does not include those who might prefer the A. F. of L. to represent them rather than the company unions which now exist in the industry....."

Imports

There is some competition from imported electrical goods, as well as in the class of products sold in the limited-price and chain stores.

Several months ago, the Code Authority was considering petitioning the President to use his powers under the National Industrial Recovery Act to limit the quantities of certain electrical goods which it was felt were being imported to such an extent that domestic production was suffering. The Code Authority felt that there was danger that the increasing ratio to domestic production might "render ineffective or seriously (to) endanger the maintenance" of the Code. No detailed data are available on this question.

Effect of the Code

Official expressions of opinion as to the effect of the Code were not obtainable. However, the unofficial consensus seems to be that the Code had a stabilizing effect on prices in general and that with a few exceptions, "destructive" price cutting had been greatly reduced. The term "destructive price cutting" in this instance is considered to mean price cutting that demoralizes the industry and results in lowering wages and forcing operation for long periods without profit. The exceptions, in every case mentioned, involved products which could be produced with very little capital investment and which in most cases were sold in limited-price or chain stores and which were, therefore, subject to extreme pressure from the buyers of these organizations.





