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CHAPTER XII  
METHODS OF STABILIZING WORK IN THE BUILDING  
INDUSTRIES

BY ERNEST S. BRADFORD

VICE-PRESIDENT OF THE AMERICAN STATISTICAL ASSOCIATION

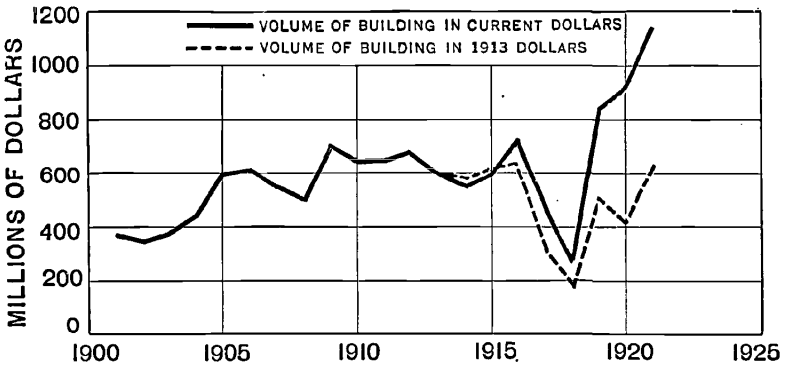
I. THE BUILDING INDUSTRY

**Introduction.**—The purpose of this chapter is to state how private building is affected by the business cycle, how much unemployment results, and what can be or is being done to reduce such unemployment.

The importance of the building industry may be judged from the fact that private building in the United States amounted in 1919 to over \$3,500,000,000 and employed probably 1,500,000 wage-earners.

**Volume-of-building Curve since 1900.**—The volume-of-building curve which follows (Chart 42), based on the estimated value of buildings for

CHART 42.—VALUE OF BUILDING PERMITS ISSUED IN 40 CITIES, 1901–1921



which permits were granted annually from 1900 to 1921 in forty cities of the United States representing a population of about 21,000,000 in 1920, shows the high and low period of building. For the years since 1914 which are affected to an unusual extent by inflated prices, these money figures have been reduced to the basis of 1913 prices by means of an index of building costs for the years 1913–1921.

<sup>1</sup> The term “building” as here used does not include construction work connected with road-making and paving, bridges, dams, canals, irrigation works and similar projects, primarily because no authentic record of such construction exists over a long enough period.

This chart, which is typical of building in the country as a whole, shows clearly the depression of 1908, the beginning of the depression of 1914 and 1915, the boom of 1916, the enormous slump in building during 1917-1918 due to war conditions, the drop in 1920 after the partial recovery of 1919, and the recent upward trend.

TABLE XXIV.—VALUE OF BUILDINGS FOR WHICH PERMITS WERE GRANTED IN REPRESENTATIVE AMERICAN CITIES (1901-1921).

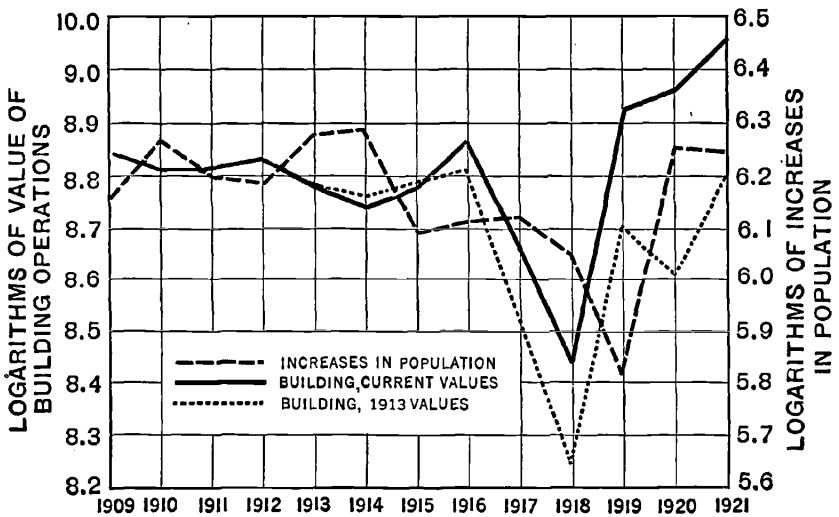
Year	Value of buildings in forty cities (millions of dollars)	Index number of building costs <sup>a</sup>	Value of buildings in forty cities in terms of 1913 prices (millions of dollars)
1901	\$369		
1902	347		
1903	375		
1904	435		
1905	597		
1906	613		
1907	547		
1908	497		
1909	700		
1910	653		
1911	656		
1912	680		
1913	606	100	\$606
1914	553	96	576
1915	601	98	613
1916	734	114	644
1917	461	139	331
1918	272	153	177
1919	846	167	506
1920	914	224	408
1921	1,143	179	638

<sup>a</sup> Based on index numbers of building material costs and building labor costs of the U. S. Bureau of Labor Statistics, weighted by the author 60 and 40 respectively, following the weighting used by the Federal Reserve Bank, New York District.

**Relation of Increase in Population to Volume of Building.**—Increase in population, rather than number of inhabitants, determines the need for building. Although existing houses and factories require repairs and additions, which accounts for some construction work, "we build primarily because our population grows." Increase in population being the main factor, it is of interest to compare the building curve with the trend of population year by year, as in Chart 43. The volume of building does not always follow the increase of population. At times it

fails to keep up with new population, particularly when the prices of building materials and labor are high; or again, some kind of building falls behind, as in 1915-1916, when the demand for industrial buildings was greatly stimulated by the expanding requirements of munition and other war factories, while the construction of dwellings remained normal or sub-normal. In general, the two curves have the same trend over a series of years.

CHART 43.—VALUE OF BUILDING OPERATIONS IN 40 CITIES COMPARED WITH THE ESTIMATED ANNUAL INCREASES IN THE POPULATION OF THE UNITED STATES.



**Additions, Alterations, and Repairs.**—Additions, alterations, and repairs average about one-seventh of the total annual volume of building, measured in dollars. This is shown by the estimated costs of buildings covered by permits issued in a varying number of leading cities, as reported by their building departments to the United States Geological Survey for the years 1910-1919, and to the United States Bureau of Labor Statistics for 1920. The lowest percentage of alterations and repairs in any of these years is 10 per cent of the total in 1910; and the highest figure is 23 per cent in 1918.

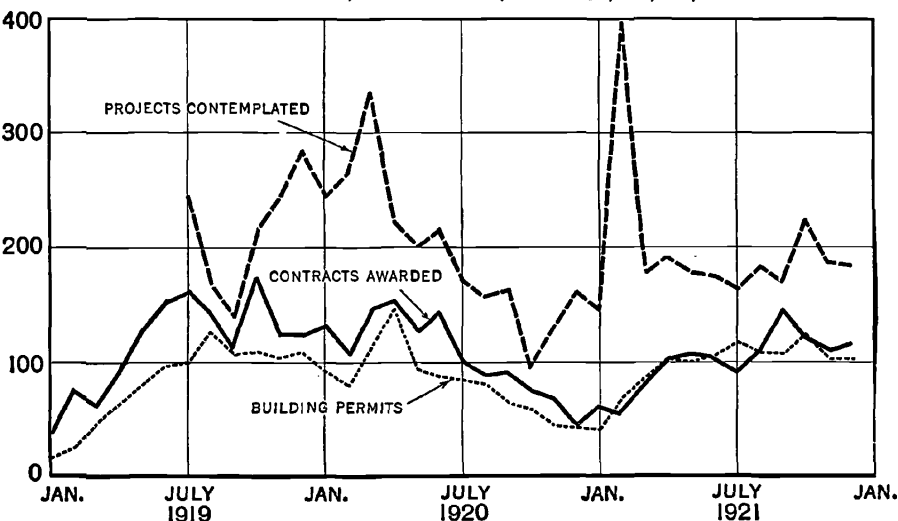
These additions, alterations, and repairs are made necessary by fires, depreciation, obsolescence and the shifting of local needs from dwellings to stores or factories, and demand for better and more convenient houses.

During the past five years, losses from fire amounted to \$1,338,178,142 in the United States, according to the Actuarial Bureau of the National Board of Fire Underwriters, or an average of over \$260,000,000 a year. If to this amount is added 25 per cent additional for unreported fires,

as recommended in the publication of the National Board of Fire Underwriters,<sup>1</sup> the total is \$1,672,722,677 or over \$300,000,000 a year.

**Sources of Building Information.**—A comparison of the figures for identical years indicates that the estimated cost of buildings, for which permits were granted in cities, suitably increased to make allowance for under-reporting of building costs<sup>2</sup> represents the volume of building in the years before the war more closely than the figures for contracts awarded. Since 1919, however, the latter figures reported monthly by the F. W. Dodge Company have closely approximated the volume of building permits as reported by cities. Chart 44 compares the estimated cost of projects contemplated, and contracts awarded as supplied by the Dodge Company with building permits in fifty identical cities.

CHART 44.—COMPARISON OF VALUE OF BUILDING PERMITS, CONTRACTS AWARDED, AND PROJECTS CONTEMPLATED IN 50 LARGE CITIES BY MONTHS, 1919-1921. (UNIT: \$1,000,000)



**Volume of Building in the United States.**—An estimate of the volume of building in the United States may now be built up on the value of the permits granted in one hundred thirty-one cities in the years 1910-1920. (1) The new construction in these cities can be separated from the repairs. (2) Twenty per cent is added to correct underestimates of cost. (3) Building in other cities is estimated on the basis of population. (4) Building in rural districts is estimated from the city figures

<sup>1</sup> *Safeguarding America against Fire*, New York City, pp. 4, 5. Some buildings destroyed by fire are not rebuilt.

<sup>2</sup> Twenty per cent increase was adopted, as recommended by a large number of architects, engineers, and contractors.

on the basis of additions to population. (5) Alterations and repairs are then added to the new construction, the same figure being used for cities and for rural districts. The results of this process, of course, are rather rough approximations.

TABLE XXV.—VALUE OF BUILDING IN UNITED STATES, 1910-1921

A	B	C	D			F	G	H
			Urban United States (millions of dollars) <sup>c</sup>	Rural United States (millions of dollars) <sup>d</sup>	Total United States (millions of dollars) D + E			
Year	Value of building permits issued in one hundred and thirty-one cities (millions of dollars) <sup>a</sup>	Value of new construction in one hundred and thirty-one cities (millions of dollars)	Estimated cost of new private construction in			Estimated cost of new private construction and alterations, additions and repairs, in total United States (millions of dollars) <sup>e</sup>	Total estimated cost in terms of 1913 prices (millions of dollars) <sup>f</sup>	
			Urban United States (millions of dollars) <sup>c</sup>	Rural United States (millions of dollars) <sup>d</sup>	Total United States (millions of dollars) D + E			
1910	\$ 914	\$ 822.6	\$1,707.2	\$225.7	\$1,932.9	\$2,277.5	\$	
1911	918	807.8	1,689.6	223.4	1,913.0	2,326.4		
1912	952	841.6	1,766.3	233.6	1,999.9	2,409.9		
1913	853	742.1	1,568.7	207.4	1,776.1	2,186.0	2,186.0	
1914	749	656.1	1,391.1	381.9	1,575.0	1,915.1	1,994.9	
1915	776	689.1	1,470.7	194.5	1,665.2	1,982.1	2,022.6	
1916	982	854.3	1,828.3	241.8	2,070.1	2,532.0	2,221.1	
1917	650	559.0	1,206.0	159.5	1,365.5	1,693.4	1,218.3	
1918	401	308.8	667.9	88.3	756.2	1,086.0	709.8	
1919	1,259	1,070.1	2,327.2	307.7	2,634.9	3,307.3	1,980.4	
1920	1,343	1,077.1	2,347.2	310.4	2,657.6	3,597.6	1,606.1	
1921	1,602	1,364.9	2,985.9	394.1	3,380.0	4,213.6	2,353.9	

<sup>a</sup> U. S. Geological Survey, *Mineral Resources of the U. S., Clay Working Industries . . . and Building Operations in the Larger Cities, 1910-1919*; U. S. Bureau of Labor Statistics, *Bulletin 295, 1920*.

<sup>b</sup> The fraction of total construction accounted for by new construction is assumed to be the same as that shown for recorded cities in corresponding years by the Geological Survey 1910-1919 and the Bureau of Labor Statistics 1920.

<sup>c</sup> Represents value of new construction in one hundred and thirty-one cities first increased one fifth to cover underestimates of values of buildings and then multiplied by the ratio of the total urban population of the United States to the population of the one hundred and thirty-one cities, which was about 29,900,000 in 1920.

<sup>d</sup> Since the increase in rural population in the United States during the decade was 0.132 as great as the increase in urban population, the items in Column D have been multiplied by this ratio to obtain the figures here given—increase in population being the main factor in building, as explained on p. 175.

<sup>e</sup> Estimate made as follows: the value of new construction in the one hundred and thirty-one sample cities was multiplied by the ratio of repairs, etc., to new construction as shown by the Geological Survey and Bureau of Labor Statistics reports. The cost of repairs, etc., for the one hundred and thirty-one cities was then multiplied by the ratio of the whole population of the United States to the population of the one hundred and thirty-one cities. This product, representing the assumed cost of alterations additions, and repairs was then added to the corresponding item in Column F.

<sup>f</sup> Derived from Column G, by dividing the items therein by the index of building costs described on p. 175.

**Purposes for Which Buildings are Erected.**—From data for 1920 covering over 200 cities with a population of about one-third of the United States,<sup>1</sup> it appears that housing constituted 37.2 per cent of the value of all new construction during the year. If to this is added the value

<sup>1</sup> U. S. Bureau of Labor Statistics, *Bull. 295, 1920*, p. 5, giving detailed data for 196 cities, with a population of about 34,400,000.

of private garages, which under present conditions are closely related to residences, construction for dwelling purposes constituted somewhat over 42 per cent of the volume of building.<sup>1</sup>

Sixteen per cent of the value of construction in 1920 was for factories and workshops, 14.6 per cent for stores and other mercantile buildings, including commercial garages, and about 11 per cent for office buildings.

These three classes account for approximately 42 per cent more of all construction work, leaving a balance of about 16 per cent to cover buildings of a public, semi-public, or miscellaneous character of which schools constitute 4 per cent; amusement places, 3.4 per cent; hospitals, 1.8 per cent; churches, 1.5 per cent; sheds, stables, and barns about 0.4 per cent; public buildings, 1.4 per cent; and the balance, miscellaneous, about 3.9 per cent.

It is believed that the figures for schools and public buildings reported, which together constitute only about 5 per cent of the total annual building (if 1920 is typical of other years), cover only a small portion of the public buildings erected in cities, in a large number of which municipal structures and those of the federal government and states are not required to have a building permit and hence are not included in the summary.

## II. THE BUILDING MATERIAL INDUSTRIES

**Material and Labor Costs.**—Fluctuations in the volume of construction tend to produce like fluctuations in the demand for lumber, brick, structural steel, cement, glass, paint, lime, lath, shingles, sand, plumbing and heating apparatus, and electrical supplies. There are other uses for some of the products of building material manufacturers which tend to stabilize these fluctuations; the lumber turned out by sawmills is in demand for furniture, packing boxes, and other industrial purposes; cement is used for paving, road-making, dams, piers and other construction work not classed here as building; structural steel goes into bridges and ships. Nevertheless, the building curve and the curve for these products, which enter so largely into building, influence one another to a marked degree. High prices of materials tend to reduce the volume of building and to produce unemployment in the building trades. A stoppage of building lessens the demand for materials, leads to depressed material prices, and tends to produce unemployment in the mills manufacturing building materials; and similar seasonal factors and cyclical swings are found in both.

**Relative Importance of the Various Kinds of Buildings.**—In the cities for which data are available, the most important building material is wood, and the value of the annual consumption of lumber is much

<sup>1</sup> This is on the assumption that about two-thirds the value of the garages constructed, or 5 per cent of all buildings, are private garages. In 1921, private garages constituted two-thirds of the total value of garages.

greater than that of any other one building material. While brick dwellings have largely superseded frame structures in large cities, these so-called brick dwellings require a vast amount of lumber, and in hundreds of small cities and villages wood still holds first place in the construction of new dwellings. Concrete and steel are an increasing factor in the erection of stores, offices, apartments, and factories.

Table XXVI shows the relative proportion of buildings classed as wood or brick since 1910 in over 100 large cities:

TABLE XXVI.—RELATIVE IMPORTANCE OF KINDS OF BUILDINGS ERECTED 1910-1921<sup>a</sup>

Year	Number of cities reporting	Per cent of total value constituted by		
		Wooden buildings	Brick <sup>b</sup> buildings	Buildings of other materials
1910.....	127	26	56	16
1911.....	108	30	47	26
1912.....	105	29	59	12
1913.....	108	34	44	22
1914.....	113	38	40	23
1915.....	123	33	51	16
1916.....	129	27	44	29
1917.....	129	27	51	22 <sup>c</sup>
1918.....	132	32	50	16 <sup>c</sup>
1919.....	128	32	44	24 <sup>c</sup>
1920.....	207	24	45	31

<sup>a</sup>Includes both new building and additions, alterations and repairs. Data from U. S. Geological Survey except those for 1920, which are from U. S. Bureau of Labor Statistics. (See Table XXV note a).

<sup>b</sup>Includes hollow tile, 1920.

<sup>c</sup>Of this 9 to 11 per cent represented buildings of concrete, 4 to 9 per cent steel skeleton, 1 to 2 per cent buildings of stone, and the balance buildings of other materials.

**Production of Building Material and Number of Wage-earners Employed.**—Table XXVII shows the production in 1914 and 1919, according to the Census of Manufactures, of the leading materials that enter into building.

These industries account for about 900,000 wage-earners in 1919. If those who are engaged in other building material industries, such as the electrical industries,<sup>1</sup> are included, between 950,000 and 1,000,000 employees are represented. Not all of the employees in these industries are engaged exclusively in producing building materials or equipment;

<sup>1</sup>As the proportion engaged in building lines is unavailable, no figures are given in Table XXVII for electrical industries.



TABLE XXVII.—PRODUCTION OF BUILDING MATERIALS<sup>a</sup>  
1914 AND 1919

Material	Value of products (millions of dollars)		Number of wage- earners (thousands)		Per cent of product used for build- ing <sup>b</sup>
	1914	1919	1914	1919	
Lumber and timber products	\$716	\$1,387	480	480	60 <sup>c</sup>
Planing mill products <sup>d</sup> .....	308	500	96	87	
Building brick.....		95 <sup>e</sup>		36	100
Structural iron work.....	159 <sup>f</sup>	295	47	44	
Cement.....	102	175	28	25	
Glass.....	123	262	74	77	30
Paints.....	112	257	13	17	
Varnishes.....	33	84	3	4	
Building sand.....	8 <sup>g</sup>	12 <sup>g</sup>			
Lime.....	18	34		11	36 <sup>e</sup>
Building stone.....	18 <sup>g</sup>	11 <sup>g</sup>	...		100
Cast-iron pipe.....	27	50	12		
Plumbers' supplies.....	43	60	18	13	
Roofing materials.....	28	86	4	9	
Stoves and hot air furnaces..	68	146	29	33	
Steam fittings, and steam and hot-water heating apparatus.....	64	160	26	37	

<sup>a</sup> U. S. Bureau of the Census, *Manufactures*, 1919, prel. totals for U. S. Big Industries and Geographic Divisions and States.

<sup>b</sup> Includes building, repair, and maintenance work but not paving or construction work other than building.

<sup>c</sup> Rough estimate of Secretary of National Lumber Manufacturers' Association.

<sup>d</sup> Exclusive of planing mills connected with sawmills.

<sup>e</sup> U. S. Geological Survey, *Mineral Resources of U. S.*, 1914, 1919.

<sup>f</sup> Not made in steel works or rolling mills. This figure covers iron and steel, structural and ornamental work for buildings, bridges, and subways.

possibly three-fourths of them is a fair approximation. Those employed in the building industries and in the building material industries together number between 2,250,000 and 2,500,000.

**Relation of Material and Labor Costs.**—The costs of building are divided between materials, labor, other expenses, and profits. Material costs and labor costs in the aggregate are commonly believed to be nearly equal, as items entering into the cost of buildings, though the exact ratio may vary considerably from year to year. This ratio appears to be between 50-50 and 60-40.

The National Federation of Construction Industries completed a composite building cost index in November, 1921 on the basis of Philadelphia cost figures from seven different types of buildings. The distribu-

tion of building costs in 1913 and 1921<sup>1</sup> according to this study was as follows:

	1913	1921
Material.....	42.88	70.74
Labor.....	44.00	70.40
Overhead.....	5.80	8.70
Compensation		
Sub-contractors.....	3.90	5.85
General contractors.....	3.42	5.13
Total.....	100.00	160.82

Labor costs in this index include: (1) all skilled labor and supervision on the building, including stone cutting, shop work on sheet metal, and mill work, but no other manufacturing costs, (2) unskilled labor, (3) general supervision, including office work, estimating, and engineering salaries, (4) liability insurance.

The percentages which each of these items constitute of the total labor cost in 1913 for the Philadelphia district according to the National Federation of Construction Industries were as follows: skilled labor 27.6 per cent; unskilled labor 9.4 per cent; supervision, etc., 5.6 per cent; liability insurance 1.4 per cent; total 44.0 per cent.

The ratio used currently by the Federal Reserve Bank of the New York district is 60-40, which ratio is also used by Leonard C. Ayres in a monograph prepared June, 1922 for the Cleveland Trust Company, entitled "The Prospect for Building Construction in American Cities."

**Course of Building Material, Prices, and Labor Costs since 1913: Index of Bureau of Labor Statistics.**—The index of the Bureau of Labor Statistics, revised in May, 1922 to include structural steel, re-enforcing bars, and nails, with weightings based on the 1919 Census, shows the course of prices of materials and wage rates since 1912. The wage-rates curve is based on rates covering over 420,000 wage-earners, and the union rates of carpenters and brick-layers represent 135,000 carpenters and 30,000 bricklayers. While there is always a difference of opinion as to just what weights to give each item in a composite index, this curve is one of several which are believed to indicate closely enough for present purposes the course of material prices and wage rates in the building trades for several years past.

Regarding these figures, the Bureau of Labor Statistics<sup>2</sup> makes the following statement:

Wholesale prices are available month by month, but union wage rates are available only as of May 15 each year, consequently their change from month to month can not be shown. However, the building trades wage rates have experienced no such wide fluctuation as have building material prices. So far as the

<sup>1</sup> The 1921 figures represent percentages of the 1913 total.

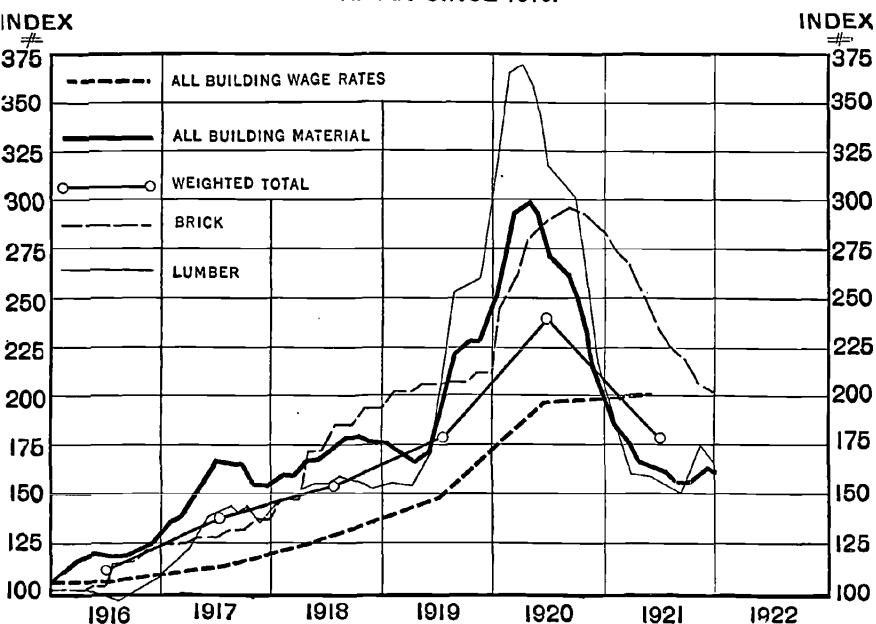
<sup>2</sup> *Monthly Labor Review*, May, 1922, p. 100.

large cities are concerned the union wage rate is the prevailing rate, if not the only rate, for the city.

Beginning with 1917 it will be seen that building material prices constantly advanced above building wage rates until 1920, in the spring of which year building material as a whole had reached triple the prices of 1913 and wage rates as a whole had doubled the level of 1913. Beginning with the spring of 1920 and continuing through into 1921 there was a heavy fall in building material prices. Building wage rates, however, held their position between 1920 and 1921. . .

With a decline in prices there was a decline in the volume of building material sold; statistics on this subject, however, are not available. During the same period while wage rates did not drop, there was a great reduction in earnings due to unemployment.

CHART 45.—PRICES OF BUILDING MATERIAL AND BUILDING WAGE RATES SINCE 1916.



Courtesy, U. S. Bureau of Labor Statistics.

**Relation of Construction Costs to Housing and Rents.**—The costs of building materials, which rose higher in proportion to 1913 figures than the prices of other commodities, tended to discourage building and alter the ratio between the supply of houses and the demand. With increased demand for housing came an increase in rents, which gradually rose until at the end of 1921 they had reached a level between one and two-thirds and one and three-fourths times the rate in 1914. By this time falling construction costs were beginning to stimulate building and the increasing number of houses and apartments prevented a further advance in rents. While there are other elements such as taxes, interest rates, and legal

exemptions or restrictions, all of which enter into the final figure of rent, construction costs are a primary factor in producing a shortage or surplus of housing.

Table XXVIII shows the relation according to different indexes, between the rent curves in New York City<sup>1</sup> and the United States,<sup>2</sup> and costs of building in New York City<sup>3</sup> and the United States since 1914.

TABLE XXVIII.—INDEX OF RENTS AND CONSTRUCTION COSTS IN NEW YORK CITY AND THE UNITED STATES, 1914-1922  
(1914 = 100)

Year	Rents			Building Costs	
	New York City apartments, type A <sup>a</sup>	New York City apartments, type B <sup>b</sup>	United States <sup>c</sup>	New York City <sup>c</sup>	United States <sup>d</sup>
1914	100	100	100	100	100
1915	101	101	102	112	102
1916	102	102	102	143	119
1917	102	107	100	164	145
1918	110	112	109	168	159
1919	121	127	114	168	174
1920	144	145	135	230	233
1921 (May)	160	166	159	193	186
1921 (Oct.)	167	175	160	177	
1922 (Jan.)	167	175	161	173	

<sup>a</sup> Renting under \$15 per room in 1920.

<sup>b</sup> Renting \$15 to \$30 per room in 1920.

<sup>c</sup> See text.

<sup>d</sup> Index of building costs (see Table XXIV) on 1914 base.

**Other Factors: Costs of Financing.**—In addition to materials and labor, the costs of financing constitute an important factor in building. The amounts paid in order to secure funds for the building of apartments, office buildings, department stores, factories, and other large structures during the period immediately following the war were in many instances excessive. Large bonuses or commissions charged in addition to interest by some of the concerns which supplied the money raised the cost of

<sup>1</sup> Federal Reserve Bank, New York District *Monthly Review*, March 1, 1922, p. 11; an average of typical buildings reported by twenty-one owners and operators of apartments.

<sup>2</sup> *Monthly Labor Review*, May, 1922, p. 76.

<sup>3</sup> Computed by the Geo. A. Fuller Co., New York City. Cost of typical hotel building used in lieu of apartment house costs, the two having fluctuated closely together.

construction and resulted in increased rents. In some cases the proposed charges for money became so high as virtually to prevent building.

### III. UNEMPLOYMENT IN THE BUILDING TRADES

**New York.**—In states such as New York and Massachusetts where there exist records of the unemployment of considerable numbers of wage-earners, collected for a series of years by an established public bureau, it appears that unemployment in the building trades is greater than in most other lines of industry.

The average percentage of union building-trade workers unemployed in New York State, where figures are available showing the percentage out of work at the end of each month from 1904 to 1916, is 26.5 per cent. This is to be compared with 19.87 per cent in all industries, 13.77 per cent in metals and machinery, and 10 per cent in printing. In clothing the percentage is also high—26 per cent. Building, therefore, has been one of the worst two industries in New York as regards unemployment. There is no reason to believe that the ratio among non-union building workmen is particularly different from that among union building workmen.

Chart 46<sup>1</sup> shows in four trades in New York State the percentages of union wage-earners unemployed at the end of each month from 1904 to 1916. The depressions of 1908 and 1914–1915 are evident in all four; together with the dull period of 1911, they are especially marked in the metal trades and very evident in the building trades, though the seasonal factor is also strongly marked. The winter peak in unemployment is an outstanding feature of building. In clothing, the cyclical movement is obscured somewhat by the presence of unemployment due to strikes; the seasonal swing is wide. Printing has an unusually even curve of employment.

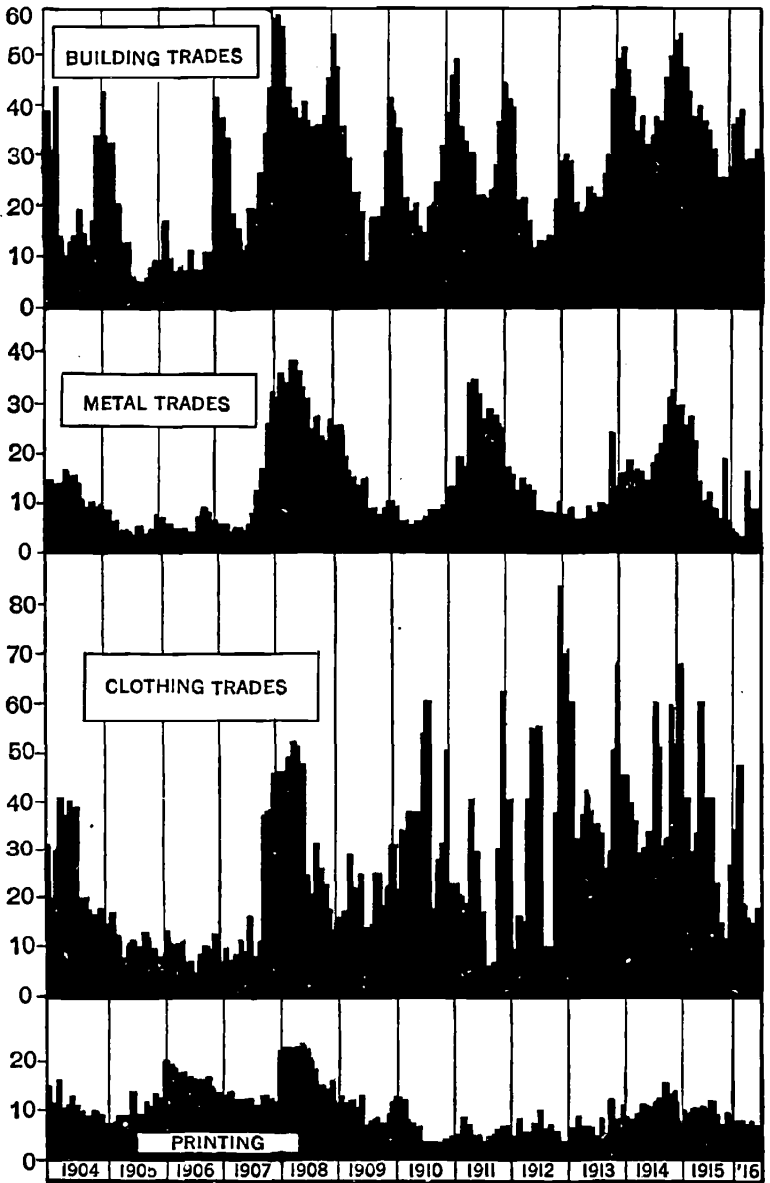
**Massachusetts.**—A similar chart is available for Massachusetts union workers, data for which cover the years 1908 to date,<sup>2</sup> whereas the New York figures of union unemployment were not collected after the middle of 1916. The Massachusetts figures are quarterly, and unemployment due to strikes has been eliminated as far as separate records were available, namely, for the years 1917–1921.<sup>3</sup> They show an average for 1908–1921 (excluding strikes for the five years mentioned) of 13.8 per cent unemployment in the building trades, as compared with 10.5 per cent in the metal trades, 10.8 per cent in textiles, 6.5 per cent in printing, and 10.8 per cent in all industries.

<sup>1</sup> From N. Y. State and Department of Labor, *Special Bulletin* 85, July, 1917.

<sup>2</sup> Data for Chart 47 supplied by Roswell F. Phelps, Director of the Division of Statistics, Massachusetts Department of Labor and Industries.

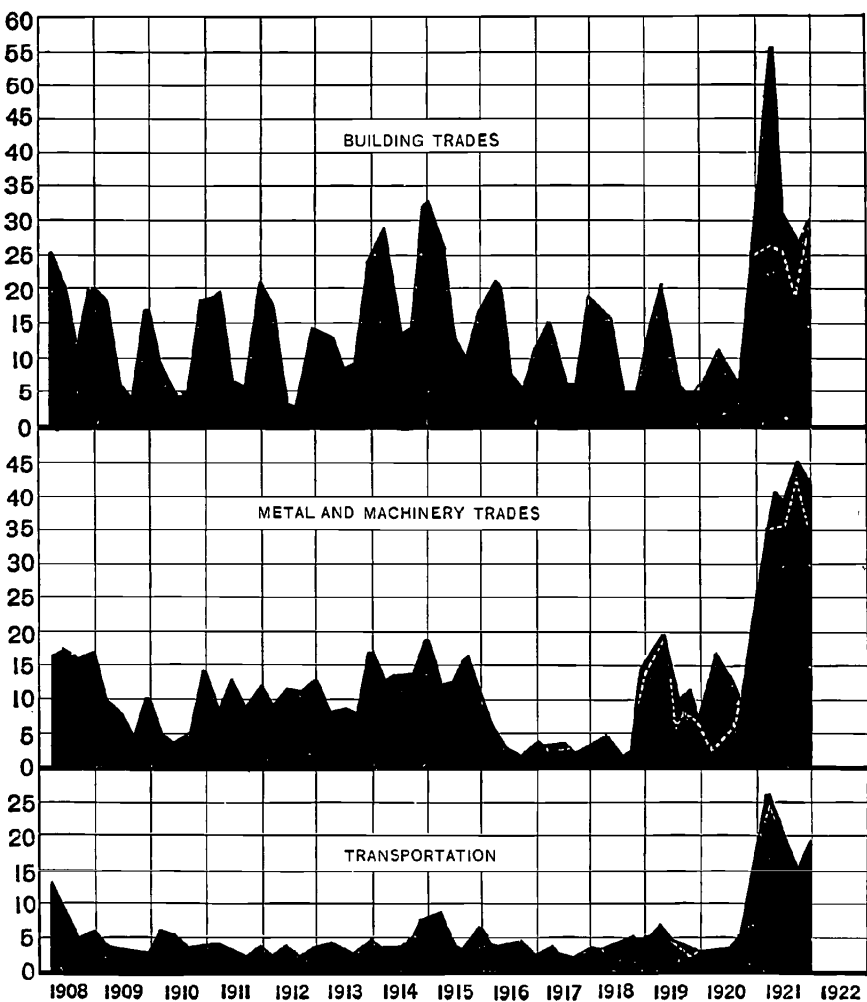
<sup>3</sup> See also Mass. Department of Labor and Industries, *Labor Bulletin* 135, November, 1921, which includes unemployment due to strikes.

CHART 46.—PERCENTAGES OF ORGANIZED WAGE-EARNERS UNEMPLOYED IN NEW YORK STATE BY MONTHS, 1916-1904.

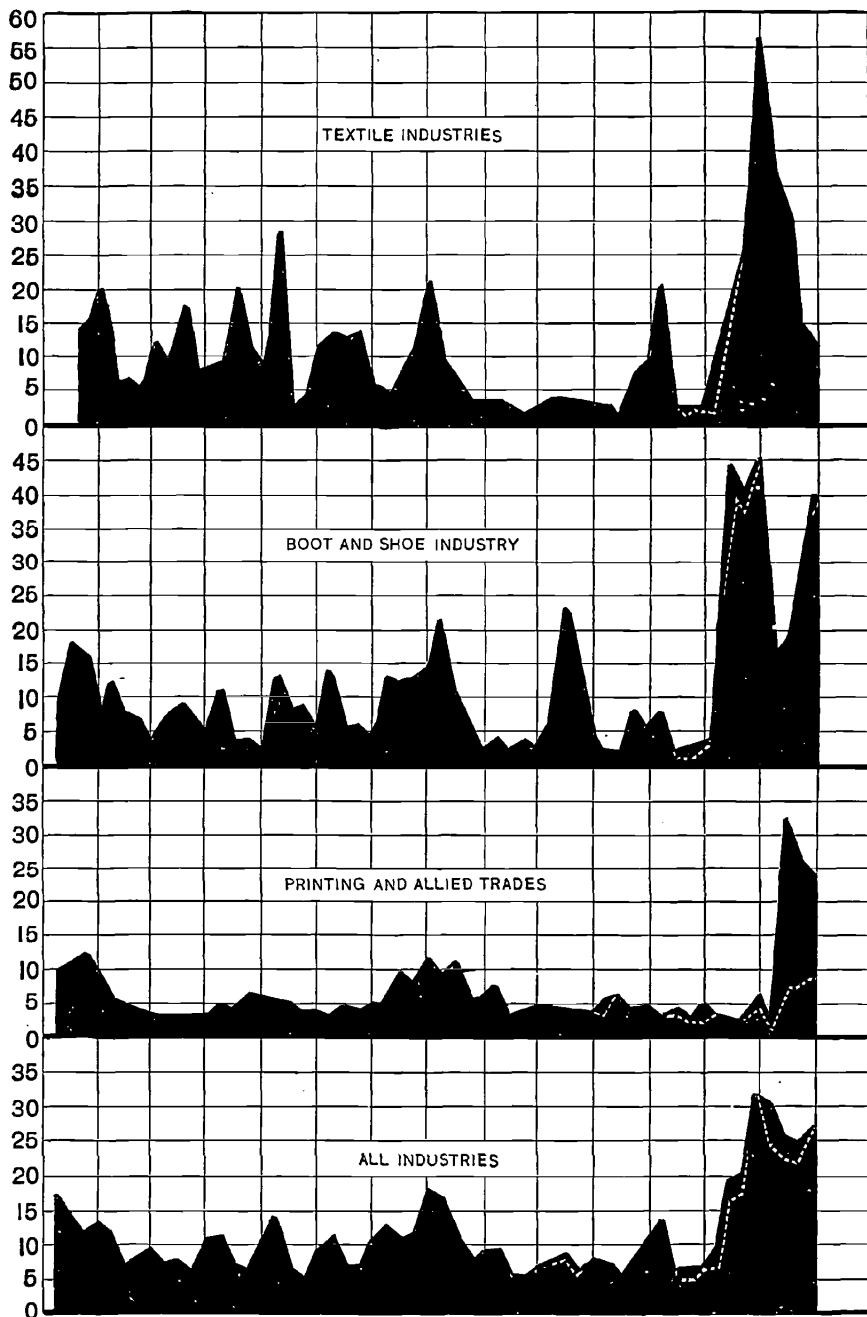


Courtesy, New York State Industrial Commission.

CHART 47.—PERCENTAGES OF ORGANIZED WAGE-EARNERS UNEMPLOYED IN MASSACHUSETTS BY QUARTERS, 1908-1921.



(CHART 47 CONTINUED)



1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922  
 Courtesy, Roswell F. Phelps, Director of the Division of Statistics, Massachusetts Department of Labor and Industries.



**Wage Loss Due to Cyclical Unemployment.**—Assuming that the average unemployment in the building trades in the United States as a whole lies somewhere between the 26.5 per cent of the union unemployed in New York State, 1904–1915, and the 13.8 per cent of those similarly unemployed in Massachusetts, 1908–1921, we may take, say, 20 per cent (or about sixty days per year) as a very conservative average of the time lost by the building trade workman.<sup>1,2</sup>

The average wage of the union workman in the building trades, according to the table prepared by the Bureau of Labor Statistics, covering over 400,000 union workers in the building trades, was about \$1.00 per hour in May, 1921 and has not materially decreased since. While many carpenters and bricklayers are receiving more than \$10 a day, unskilled labor is getting very much less. Assuming that the average building wages run about \$6 per day and that there are 1,500,000 wage-earners,<sup>3</sup> a loss of sixty days each means an annual loss of \$540,000,000. While it is true that a large but undetermined part of this is due to seasonal factors, strikes and disability, a glance at the charts for New York and Massachusetts shows that a great part must be cyclical in character.

#### V. METHODS ACTUALLY IN USE AND PROPOSED FOR STABILIZING BUILDING WORK

**Methods Used by Manufacturers: Planning Work Ahead: Repair Work.**—The Charles Warner Company of Wilmington, Delaware, manufacturers and dealers in lime and dredgers of sand and gravel, who employ about five hundred men normally, used the following plan of meeting the depression:

About three years ago, we submitted to our Board of Directors a five-year program, the items of which were to be carried out in whatever order proved most practicable. In the fall and winter of 1920 after our business had fallen off and we began to really feel the depression, we undertook the building of eight barges for use in dredging sand and gravel. At 1920 prices these would have cost us about \$25,000; they actually cost us about \$18,000, a saving of \$7,000. This was not only good business for the company, but kept many of our men

<sup>1</sup> The report on, "Waste in Industry," found more rather than less, than the above amount, as the time lost, reporting that the average wage-earner in the building trades worked only 190 days in the year. "Waste in Industry," Chap. V, *The Building Industry*, p. 53.

<sup>2</sup> In the trade-union figures for unemployment, there is, I believe, a certain fictitious element, due to men who are superannuated or are otherwise unable to work, being reported as unemployed. This error in the figures may be suspected from the fact that practically none of them hit the zero point of unemployment with any regularity.—Note by M. C. ROBBY.

<sup>3</sup> The Committee on Construction of the President's Conference on Unemployment put this number at 2,000,000; others have placed it only slightly above 1,000,000. The U. S. Census of Occupations (Press release, July 29, 1922) places it at 1,878,000. Willford I. King estimates it at 1,600,000.

employed who would otherwise have been out of work and without funds. Then we built a new stone-crushing plant, which we had in mind for some time previously. In the fall and winter of 1921, when times were bad, we rebuilt and enlarged two of our dredges, and did a lot of renewal work on the steel cars at our limestone quarries. There is always a lot of such work and renewals which need to be done to keep a plant in condition, and the time to do it is when business is slack; repairs and reconstruction always interfere with operations and can be done best when orders are not pressing. We were also able to increase somewhat our sales of lime to farmers during the depression, by pointing out the advantage to them of existing low prices.

Of course, the ability to carry on improvement work during times when little money is coming in presupposes either a financial reserve or good credit. It is not well to wait until a depression is on before jumping in with improvement projects; there should be a plan worked out beforehand.

A large management corporation says:<sup>1</sup>

As public utilities, our companies have to plan well ahead and it is necessary to anticipate extensions and do new construction work before conditions force us so do so. Our engineering investigations, in particular, we make long in advance, so that when the need arises, it is not necessary to delay construction until after the requisite preliminary work has been done. A case in point is Seattle where we planned out a five-year development of dams and power houses.

Another large engineering management firm, which directs an extensive line of properties by keeping in constant touch with the executive officials of utilities using its management and engineering service, is able to formulate construction programs for some of them considerably in advance of immediate needs. The fact that the company has a large number of properties under its management makes it possible to keep its engineering department constantly busy in connection with one or another, and helps to iron out any high or low spots in its own staff. This makes it possible to keep specialists employed even during times of depression.

An electrical railway company in northern Ohio planned its tie renewals ahead:

We knew that each year on a certain section of track about six hundred ties had to be put in and that the men in the regular renewal gang were not able to put in that number. At times, therefore, when the steel mills in our town were shut down, we made a practice of hiring idle steel workers and putting them on the job of renewing ties along the line. The putting in of new steel was similarly done at slack periods. The steel mills producing special railroad work, urged street railways to contract for their crossing switches, inter-locking plants, etc., in the fall and winter, to be delivered along in the spring. These orders kept the steel men going all winter, and enabled the mill company to plan its work some months ahead.

<sup>1</sup>STONE & WEBSTER, Boston, letter of May 12, 1922.

A boiler manufacturer<sup>1</sup> states:

We have endeavored to overhaul machinery, make any necessary repairs to buildings, and do whatever construction work is possible on the plant during slack periods, thus keeping as many men employed as we could, while at the same time putting everything in first-class condition to be ready to operate when the business depression ceases.

A glass manufacturer<sup>2</sup> of Toledo, Ohio, says:

The construction work which we have done during the period of depression has been largely in the nature of alterations and repairs, giving that portion of our organization, which would not otherwise be busy, work during these dull periods.

The Flour State Baking Company<sup>3</sup> of St. Paul, Minnesota, states that it is their settled policy to make renewals during depressions. "This work is partly new construction and partly repairs. It has kept our house engineering and maintenance crew busy during the slack season."

One of the most comprehensive systems of planning ahead is that used by the Bell Telephone Companies. In many territories the telephone company makes a very thorough survey of every large city and semi-urban districts as well, for the purpose of determining what the probable population will be in twenty years and its character. With this as a basis, it estimates how many new central offices will be required and how many telephones will be in use in the city or district at the end of this period. This thorough sort of forecasting is a complex process involving the close study of a considerable number of factors, such as growth, character and nationality of population, immigration, income as indicated by rents paid, telephone using habits, etc. The result gives a very comprehensive view of the future needs of the business and makes it possible for the company to go confidently ahead, in periods of poor business, getting ready for the business which is coming when times are better. It is also valuable in preventing the placing of telephone exchanges in wrong locations, where future business might not warrant.

**Stabilizing Methods Used by Contractors and Builders.**—The effect of the long-range planning of the manufacturer may be either to provide work for large numbers of those engaged regularly in building or to keep his own employees busy—the latter being the case when repair and maintenance work is utilized to provide employment. The problem of the contractor-builder is narrower—that of getting enough business for his own concern to hold his working force intact.

*Educating Customers to Build during Low Cost Periods.*—One of the methods used by building contractors to stabilize their business during

<sup>1</sup> Abstract of letter from Duluth Boiler Works, Duluth, Minnesota, May 10, 1922.

<sup>2</sup> Letter, June 6, 1922 from Libbey Glass Manufacturing Co.

<sup>3</sup> Letter, May 10, 1922.

depressions is to call the attention of customers to the advantages of building during such periods.

L. C. Wason of the Aberthaw Construction Company, Boston, says:

We study our market and seek business from concerns who, we know, are strong and far-sighted enough to plan the construction of additions to plant some time in advance. We are putting up a new factory now for a manufacturer who will not need the building until next year, but who has seized this opportunity to put up his new structure while materials are low priced and labor is plentiful. In times of activity we make a careful selection of the work offered and do not take more than we can do justice to; in times of depression all hands turn in and do an aggressive job of selling our services, thereby getting more business. We have issued a number of circulars showing concrete construction in cold weather and the ease with which it could be done, and in the fall of the year have tried thereby actively to stimulate building during the winter with some degree of success. The difference in cost between summer work and winter work is, at a maximum 5 per cent and sometimes even less.

We have not been in the habit of cutting prices in the winter, but of showing the owner that the difference in price is a good deal less than the loss he would sustain by delay if he is really in need of a building now.

William Steele & Sons Company, one of the largest contractors in Philadelphia, who specializes in the construction of commercial and industrial buildings and factories, states:

When business fell off in the fall of 1920, we began to advertise, urging people to build during this period of reduced labor cost. This had an immediate effect in increasing business, and enabled us to keep a large part of our workmen employed during the fall and winter.

It is possible to provide steadier employment when a concern is large and has a number of jobs always ahead or going on at the same time. This enables a concern like ours, for example, to shift men from one contract job to another and makes it possible to keep employees busy more continuously.

In addition we use some men in more than one occupation or job. We keep a nucleus of two to three hundred men all the time—those who are the most dependable.

Our work normally is the construction of industrial buildings of all types, but principally of concrete. Our total business runs between seven and eight million dollars a year.

Hoggson Brothers, New York City, use the following plan:

While our business is principally with a clientele with whom "high peaks" and "deep depressions" occur less frequently than in many other lines of business, still there have been times when depression has been reflected among our customers. Under such conditions we have redoubled our efforts at the selling and advertising ends of our business, and have undertaken contracts in smaller units than we would or could consider in busier times. As our work is carried

on both north and south, the winter months do not present the difficulties to us that they do to others.

Kuehnle, painting contractor, Philadelphia, attempts to create steady business both in times of depression and during the winter months by the following methods:

A strong selling organization is constantly on the lookout for houses and other buildings which need painting.

1. To the owners of buildings they explain the advantages of painting during slack times when plenty of good workmen are available and costs of materials and labor are reasonable.

2. To a mailing list of 30,000 names, a letter is sent twice a year asking them to specify their painting requirements. This list consists of customers who have had this concern do painting for them, mainly home owners, or persons who have requested estimates on painting or decorating work; it includes also some hotels, railway stations, office buildings, clubs, etc. A large volume of work is secured by this means, much of it during the winter, consisting mainly of repainting jobs.

3. Advertising results in increased business. The company has a sign on every large job with their distinctive trade mark, a painter running swiftly with a brush in one hand and a pail of paint in the other.

The painting business of this concern amounts to about \$700,000 a year. About 80 per cent of their painting business—as far as number of men are concerned—is repainting work; the remaining 20 per cent is work on new buildings. The company which averages about three hundred men in its employ in normal times kept about that number pretty continuously at work even in 1921.

There appears to be considerably less steady employment in cases where contractors do not use stabilizing methods. Another painting contractor in Philadelphia who employs from one hundred to one hundred and fifty men normally, and who is known to do good work, is able during the winter to keep only from fifty to seventy-five men busy, mainly on inside work. He states that he has no way of getting work for his other men during December, January, and February.

*Permanent Nucleus of Workers; Using Same Men on Several Jobs.*—A method employed by a number of concerns, already referred to, is to keep during good times and had a nucleus of workers whose industry and loyalty are known. The result is that an amount of production per man is secured which is not equalled by that of the employee who is hired today and let go tomorrow, and who feels no particular sense of responsibility for results.

Closely related is a third device, found effective by the Aberthaw Company and others, of using the same men on several kinds of work. This is not quite the same as "dovetailing occupations," but the effect is similar giving steady employment to men who would otherwise be out of work for a time.

The Aberthaw Construction Company states:<sup>1</sup>

Most of our mechanics or riggers will work at times erecting structural steel where the connections are bolted.

Our carpenters invariably erect the steel sash, thereby giving some of them employment after the form-work is over. Some carpenters also work as painters and at glazing steel sash.

Cement finishers combine also as cement plasterers. Bricklayers also do lime plastering. Laborers start with pick and shovel, later work in the concrete gang, then at rubbing down concrete surfaces, also some of them go into the gang for laying reinforcing steel.

*Taking Contracts at or near Cost.*—A contracting and building company of Philadelphia and Pittsburgh, states:

We got business during the depression of 1921 by telling prospective customers who hesitated to build during a falling market that we would divide with them any saving in cost (due to fall in prices either of labor or materials) which might take place between the time of making the contract and the time of building. This insured the customer against loss and made it advantageous for him to place the contract at once. This method was responsible for a large share of the business that we got in 1921.

We also, when necessary, took business at a low margin of profit in order to keep the wheels going, figuring this margin at exactly the cost of overhead. This, of course, is done only in times of unusually poor business.

Our firm keeps a number of superintendents—fifteen or twenty in number—continually employed: These we rely upon to direct our workmen. We also keep one or more foremen for each superintendent. We normally employ about seven hundred and fifty men on our various jobs, keeping a small nucleus of reliable workmen and picking up other men at such times and places as we need them.

While we specialize in factory buildings, in time of depression we widen our field of activity and take any kind we can get—hotels, office buildings, large dwellings, etc.

A Southern contractor writes:<sup>2</sup>

Our company had a very successful year in 1921, which the writer attributes entirely to the fact that we observed plain common sense rules based on the law of supply and demand. Business was slack and we figured very low, in many cases at actual cost. Not having labor contracts that prevented, our men agreed to reduced wages which enabled us to keep them employed at practically

<sup>1</sup> Personal interview with L. C. WASON, President of Aberthaw Construction Co., 27 School Street, Boston, Mass.; letter from C. E. PATCH, Statistician, dated May 22, 1922. This company gets its business on the basis of a cost plus a fixed fee, rather than by competition on a price basis.

<sup>2</sup> Letter of May 19, 1922, from W. F. CREIGHTON, President, Foster & Creighton Co., Nashville, Tenn.

ull time—the result was very satisfactory. In purchasing material every care was exercised to secure the lowest price.

#### *Repair Work.*

During periods of depression we 'put our house in order,' take inventory, repair, and build tools and equipment, either for ourselves or for others or both.<sup>1</sup>

While this district suffered less than most others during the recent depression, we did make a definite effort to keep up our volume of business. One method of increasing business was the establishment of a remodeling and repairing department, under a separate and distinct management, which would not interfere with our regular contract work. This department handles all kinds of repair work, but most of the work is obtained on commercial buildings rather than residence work. This department has shown a good profit and we have continued it ever since.<sup>2</sup>

When winter comes, we endeavor to keep our regular employees busy on southern work, where field operations can be carried on during the winter months and also on repair work on equipment so that it will be in shape to put on work when the season opens in the spring.<sup>3</sup>

The taking of repair work and other small work, which was about the only thing that could be gotten during these depressions, at practically cost, has proved to be about the best thing to do to hold your organization together, as well as to furnish employment for what men could be used.<sup>4</sup>

It is our policy to encourage repair work as much as possible during the winter season and at times when big work is at a low ebb.<sup>5</sup>

*Turning Attention to New Kinds of Contracting Work.*—The Thomas Haverty Company,<sup>6</sup> California contractors, say:

It has been our policy to follow the class of work for which there has been the greatest demand. Our business is sanitary engineering, and a few years ago when the big building operations were held up on account of the war, we conceived the idea of training our men to do residence work, which at that time was very good. We also went into pipe line construction, which during the war proved to be work of considerable volume.

A factor which we consider of great value lies in the labor-saving devices which we purchase. It has been our aim to buy the best machinery obtainable, employing high grade operators to take care of it. Our equipment is kept up in every conceivable manner so that once it goes to the job it is as nearly perfect as we can make it. Considerable business is secured through advertising.

<sup>1</sup> Letter of May 16, 1922 from W. J. HOWARD, Engineer, The Kelly-Atkinson Construction Co., Security Building, 189 W. Madison Street, Chicago, Ill.

<sup>2</sup> Letter of May 22, 1922 from R. A. SMALLMAN, Smallman-Bruce Construction Co., Inc., Avenue E between 11th and 12th Streets, Birmingham, Ala.

<sup>3</sup> Letter of May 15, 1922 from GEORGE W. KOSS, President and General Manager, Koss Construction Co., 5th and L. U. Ry. Tracks, Des. Moines, Iowa.

<sup>4</sup> Letter of May 15, 1922 from W. J. QUICK, Alexandria, La.

<sup>5</sup> Letter of May 16, 1922 from C. E. BAXTER, Baxter Brothers, Huntsville, Ala.

<sup>6</sup> Letter of May 18, 1922 from GEORGE HESS, Thomas Haverty Co., Eighth and Maple Sts., Los Angeles, Cal.

An Alabama concern<sup>1</sup> states:

There is but little repair work done out of our office, but we have what we call the fire loss department and through this we handle, protect, and replace fire damages. And this we use as our fill-in, and taking the total work handled during the year it makes quite a nice business in this line.

Another plan is shown in the following letter:<sup>2</sup>

In the construction field our activities have been confined to foundation and bridge construction for railway and mining companies.

While there was a depression in all construction lines following the war period, in many cases similar to ours, the constructors' activities were so specialized that when the railways ceased construction work their construction forces practically ceased activities for months.

However, prior to the period of depression, in October 1919, realizing that our business should be spread over other lines, we started the manufacture of concrete piling and reinforced concrete pipe. From May, 1921 to December, 1921, during which time our construction department was idle, the concrete products portion of the business materially assisted in carrying our fixed expense.

Perhaps the concrete products business, on account of the fact that these products are used largely by railway companies, is not so good a medium for averting depression as some business not so closely allied with construction; still, at the same time, it does give access to a larger field—which, in principle, is the thing that the constructor perhaps needs most at such a time, and in our case required little additional capital investment.

*Assisting Customers in Financing Building.*—The C. S. Lambie Company, contractors, of Denver,<sup>3</sup> emphasizes a different angle:

When work is scarce, we find that we can very often go out to prospective builders and by assisting them in a financial way—that is, getting them the money with which to build and by giving them extended credit, we can very often induce them to go ahead with work which might otherwise be delayed.

Other concerns state:

We keep as many of our Class 'A' employees busy on repairs as conditions will permit so as to have machinery and equipment in shape when business resumes.

We have on several occasions continued our operations beyond the point which our clients believed conditions warranted, on a deferred payment plan, and have suggested it at other times as a means of relief to the unemployment situation.<sup>4</sup>

<sup>1</sup> Letter of May 18, 1922 from W. P. BLAIR, Manager, Inglenock Construction Co., 4011 First Avenue, Birmingham, Ala.

<sup>2</sup> Letter of May 22, 1922 from J. R. STACK, Stack Construction Co., Duluth, Minn.

<sup>3</sup> Letter of May 15, 1922 from C. S. LAMBIE, President, C. S. Lambie Co., Tramway Building, Denver, Col.

<sup>4</sup> Letter of May 16, 1922 from F. H. HOLLADAY, Vice-President and General Manager, Winston-Dear Co., Hibbing, Minn.



In times past, when the sale for securities has been dull, this company has taken work and carried the securities when the investment was a safe one. This has not only helped out the unemployment, but has proved good business on our part.<sup>1</sup>

We make every effort to have inside work. We take a smaller profit during winter season and just now (1921) are operating at no profit at all in order to create a pay-roll.<sup>2</sup>

We heat the houses so the workmen can work in them.

We do quote at a lower profit, but the risk is greater in winter and this offsets the reduction a great deal.<sup>3</sup>

A company<sup>4</sup> hiring between 1,000 and 2,000 men writes as follows:

If possible, we try to enclose our buildings before cold weather, then finish interior with heat on.

Another company<sup>5</sup> hiring normally 200 men reports that:

We attempt to get buildings closed in before winter weather sets in. We will take work at a smaller profit any time to keep our organization intact and cover our overhead, but due to slack season in winter being the most risky season to do work we usually have to carry more profit to cover the risk involved.

The Portland Cement Association has issued several booklets describing successful ways of carrying on concrete construction during the winter. The secretary of the association estimates that there has been an increase of 15 per cent in the amount of winter concrete work in the past three or four years.

*Dovetailing of Occupations.*—The dovetailing of summer occupations with winter employment is receiving attention. An architect recently stated that about the only workmen who need to remain idle most of the winter are the masons, softstone cutters, and bricklayers. Where masons are permitted by the unions to do plastering, they are able to get a good deal of inside work during the winter. In softstone cutting, it may be necessary to provide another trade, since there is no demand for this sort of work for more than six or seven months of the year. To some extent it is possible to anticipate stone cutting jobs and to do this work under cover in the winter.

All of these represent the efforts of contractors or engineers to cope with an existing depression and are but a beginning on a part of a few of the more progressive and intelligent concerns. The more fundamental task of reducing or foreseeing and preparing to meet the depression has

<sup>1</sup> Letter of May 17, 1922 from S. H. HEDGES, President Puget Sound Bridge & Dredging Co., 811-821 Central Building, Seattle, Wash.

<sup>2</sup> Letter from The A. Bently & Sons Co., Toledo, Ohio.

<sup>3</sup> Letter from The W. J. Parsons Housing Co., 1616 Monadnock Building, Chicago, Ill.

<sup>4</sup> Letter from Walbridge-Aldinger Co., 2356 Penobscot Building, Detroit, Mich.

<sup>5</sup> Letter from W. A. and H. A. Root, 1 Beacon Street, Boston, Mass.

been given little attention. This involves a thorough study of the business cycle in general, its relation to building, and analysis of the methods by which a whole industry can be organized on a more continuous basis, and includes such subjects as standard sizes and shapes of building materials, the relations of contractor-employers to labor, and other fundamental problems of organization or management.

**Elimination of Unnecessary Grades, Sizes, and Shapes of Building Materials.**—The Department of Commerce suggests standardizing building materials. Present day manufacturing constantly anticipates demand. In order to manufacture to stock, the manufacturer of building materials should have a minimum of sizes and styles to make and to carry on hand. In some lines, such as common brick, the sizes are already few, to the manifest advantage of all concerned. In others, much remains to be done. In window glass, are one hundred to one hundred and fifty sizes of single strength glass necessary to satisfy the needs of our people? In window sash the wholesale sash and door dealers often advertise more than four hundred different sizes and styles. Why so many? It is a burden to the producer, wholesaler, and retailer; an extra cost which is handed on to home owner or renter, office or store owners, or other consumers.

It has been the custom in the structural slate industry for the quarryman to prepare the structural slate in accordance with the orders he receives. The architect and builder specify the sizes. Here we have another instance of production to order which does not permit the quarryman to produce for stock, for neither the size nor the design is known in advance. This results in a heavy investment to take care of the peak in production. It means not only an unnecessary investment and equipment but high seasonal employment of labor. It results in unemployment and a high labor cost.

The structural slate producers of Pennsylvania have proposed standards after very careful study, but before much good can come from this step, they must have the support of the architects and the builders.

It is possible that a smaller number of sizes of pipes, drain tile, hollow building tile, glaze tile, the fittings, doors, locks, and other items of hardware can be produced. Just how far it is advisable or advantageous to go in the direction of the elimination of variety, few manufacturers or builders are now in a position to say. It is time, however, that a study be made with the cooperation of all groups interested in construction to determine how far fewer dimensions should be produced, fewer varieties placed on the market without curtailing or without hindering the initiative of the individual in making intelligent progress and advancement.<sup>1</sup>

The owner of the building when completed would find it much more economical to be able to buy standard stocks in maintaining the structure.

<sup>1</sup> Address before National Assn. of Builders' Exchange at Memphis, Tenn., February, 1922 by J. M. GRIES, Chief of Division of Construction and Housing, U. S. Department of Commerce.

So also with standards of work, which need to be more definitely established, standard methods of cost keeping among contractors, and a more nearly standard form of building contract.

The adoption of a uniform building code throughout the entire country will also tend to stabilize the building industries, making it possible for contractors to buy standard materials for jobs in the different states. Simplification in all these lines means more stable business and steadier employment.

#### **Building Statistics: Study of the Market for Construction Work.—**

The preparation and use of adequate building statistics, showing the annual volume of construction of dwellings, stores, mills, theatres, etc., will call attention to temporary overbuilding in one line or in general, and warn the contractor or engineer against a coming condition of stagnation. It may lead the manufacturer to hasten his building expansion or to postpone it to a time of lower costs.

Study of the market for a contractor's service may prevent his entrance into a field already over-crowded with competitors and lead him to seek expansion in less occupied territory. It may also disclose possibilities in respect to repair work, building management or special kinds of new construction which promise active and continuous business. What has already been done in these respects by those who have given the subject even cursory attention, suggests how much more can be done when a thorough study is made.

**Builders' Exchanges as Clearing Houses of Information.—**The more complete organization of the industry into local builders' exchanges with provision for workmen's participation when feasible, as in the Philadelphia plan, proposed by the Building Trades Council of that city under the leadership of D. Knickerbacker Boyd, is another fertile field for consideration.

A clearing bureau of building activities for an entire city or district, as proposed, would supply materials and employees to all as required, and the exchange of information would tend to prevent over-building. There is a considerable group of functions, including the direction of building-trades schools to be performed by this sort of trade association.

**Education of the Public.—**The public should be educated to do its repair work in the dull times of mid-winter or other off seasons. Here a large home-owning population is an advantage. It is the owner of his own house who is in a position to defer his carpenters' alterations, painting, or electrical and plumbing changes until the building rush is over; the landlord or leasing agent, who has to prepare in August and September for the next tenant, is almost compelled to crowd his repair demands into sixty or ninety days, which come at a time when other construction is in full swing.

So all parts of the problem dovetail together; the rental season and the extent of home ownership affect the possibility of the shifting of a part of the peak of building work.

**Job Scheduling and Planning.**—Each building job should be studied in detail and planned ahead, in order to have materials and men on the job as required.<sup>1</sup>

This scheduling, together with proper cost-keeping, should in time enable contractors and engineers to estimate closely the cost of any proposed job, and thus bid more intelligently on contracts.

## V. SUMMARY

The planning of work ahead by manufacturers and public utilities has proved to be an effective factor in stabilizing business and employment in a number of instances, though practiced as yet by few manufacturers. Repairs and renewals, undertaken during depressions, have given employment to considerable numbers of wage-earners in particular companies. Contractors and engineers have been able to keep employees busy by the various methods cited, one of the most important of which has been the cutting of building costs. These have been entered upon principally in an effort to meet the depression of 1920–1921 and without any fundamental program of preparation for the next depression, or study of the means by which it may be made less severe. Most of what has been done has been by individual concerns. The fundamental economic facts of building and their bearing on one another remain yet to be collected and studied by the building industry as a whole.<sup>2</sup>

<sup>1</sup> "Waste in industry," 1921, *The Building Industry*, p. 73.

<sup>2</sup> A real stimulus to building construction during a depression can only be given by at least a temporary sharp cut in building costs. Nearly all other devices appear to relate to the regulation of seasonal fluctuations, and to the maintaining of steady activity on the part of individual firms, without any general effect on the building industry as a whole. As I see it, to start a recovery from any acute depression, it is necessary to induce someone, somewhere, to borrow money and spend it. In the field of consumption goods, this appears to be more difficult than it might be in the field of building construction. On the other hand, no prospective investor in a building is going to borrow money to build unless he thinks he is getting a bargain. Such bargains develop, unfortunately, rather late in the ordinary business cycle; and the problem, I feel, is rather clearly that of presenting such bargains at a much earlier date in the cycle than they have hitherto been presented.—Note by M. C. RORRY.