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CHAPTER 3

The Structure of Wages

BEFORE analyzing the data relating to long-term changes in the structure of German wages for the period 1871-1945, a warning is in order about certain limitations in the basic materials available to us. Ideally, we should have at our disposal a body of information that would enable us to classify rates and earnings by skill, age, sex, region, industry, size of city, size of establishment, degree of cartel control, extent of union organization, and perhaps other relevant characteristics. Unfortunately, the materials at hand are inadequate for such thorough cross-classification. Thus, especially for the first four decades, the analysis can provide only a meager indication of major trends. The data are somewhat richer from 1913 on; for that year, and for the period 1924-43, there are union rate statistics which offer some guidance for the evaluation of wage differentials and of changes in them. These union rates are broken down by skill, sex, and industry. Moreover, for part of the twenty-year period, such data exist for representative regional centers in each industry. There are also occasional breakdowns of wage rates by age groups.¹

In the present chapter—and always within the limitations just noted—the task is to trace long-term changes in the wage structure with respect to two major groups of differentials.² The first comprises wage differentials relating to characteristics of the workers themselves, that is, skill, age, and sex. The second brings together differentials relating to the character and location of employment, that is, industry, region, and size of city. Some of these characteristics are, of course, closely interrelated. Thus, advanced skills are more frequent among male than among female workers; heavy industries are concentrated predominantly in large cities and in the western and northern parts of Germany. But even where there is no apparent interrelationship, one can compute only in rare cases the “pure” or “net” differentials by which to measure the effects upon wages of variations in a single characteristic. In general, differentials must frequently remain in an “impure” or “gross” form, expressing, for example,

¹ Investigation of wage structure might, of course, include other aspects, such as analysis of wage payments by size (wage income distribution). Information on this subject is extremely scanty. For an analysis of wage income along these lines, based on social insurance contributions, see “Die Schichtung der Lohneinkommen: Statistik der Beiträge zur Invalidenversicherung 1929 bis 32,” *Vierteljahrshäfte zur Statistik des Deutschen Reichs*, 1932, iv, p. 82. A recent study dealing with the explanation and function of wage differentials is Friedrich Fürstenberg, *Probleme der Lohnstruktur* (Tübingen, 1958.)

² In this study the term “wage differential” denotes the difference between the lower and the higher wage level, expressed in percent of the higher. The skill “differential” (skilled less unskilled, in percent of skilled) and the skill “ratio” (unskilled in percent of skilled) add up to 100 percent.

differences between men's and women's wages without taking into account variations in skill or other factors.

Differentials Relating to Type of Worker

SKILL DIFFERENTIALS

The evidence indicates a decrease of skill differentials between the beginning and the end of our period (see Appendix Table A-14 and Chart 10). Building is the only industry for which skill differentials can be computed in an unbroken record extending from 1871 through 1943. In 1871 hourly wage rates for unskilled building workers in Berlin, Nuremberg, and Rostock represented about 70 percent of those for skilled workers. In 1943 unskilled building workers earned about 80 percent of the wages of skilled workers.³ There are other series on skill differentials at our disposal but they cover only segments of the long period.

Even a casual inspection of the charted material shows that the tendency toward decreasing skill differentials did not assert itself in all subperiods, and that when it was present it varied greatly in strength. Let us now follow the course of skill differentials period by period.

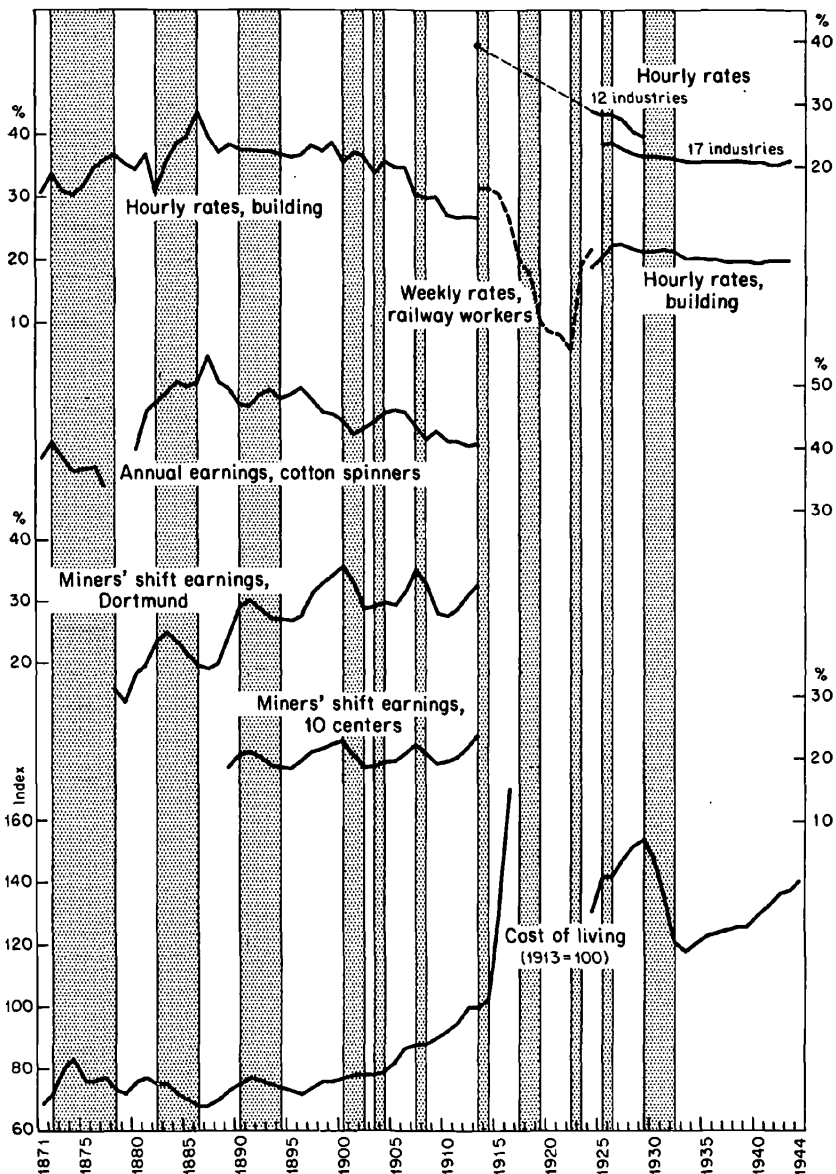
1871-1913. During the first two decades, the gap between wages of skilled and unskilled workers widened; during the last two or three decades before the outbreak of World War I, it tended to narrow. This appears clearly in the differentials for building workers and cotton spinners, depicted in Chart 10. With some differences in timing and amplitude, this "long cycle" in skill differentials is also suggested in the mining series given in Appendix Table A-14.⁴ The net effect of the widening and narrowing of skill differentials during the period 1871-1913 cannot be definitely ascertained on the basis of the available evidence. If there was a net change it cannot have been marked. However, the narrowing of skill differentials

³ The latter ratio is based on all cities, so that the two ratios are not comparable in coverage. However, in 1913 (the only year available for both samples) the differentials are similar enough to justify the long-term comparison. Masons or carpenters are used as representative of "skilled" occupations, their helpers as representative of "unskilled."

⁴ Only the differentials for building workers are reasonably "pure." For cotton spinning, earnings of skilled spinners are compared with those of the whole spinning department—including largely unskilled women, but also some skilled and unskilled men. Skill differentials for mining workers are "gross," since the division between underground and surface workers corresponds only roughly with that between skilled and unskilled.

Further pairs of wage series, permitting computation of skill differentials for this period, may be found in the following sources: Robert Kuczynski, *Arbeitslohn und Arbeitszeit in Europa und Amerika, 1870-1909* (Berlin, 1913), pp. 30, 62, 67, 71, 120, 138, 258, 308, 294, 302; and by the same author, *Die Entwicklung der gewerblichen Löhne seit der Begründung des Deutschen Reiches* (Berlin, 1909), pp. 87, 94; Franz Thieme, "Die Entwicklung der Preise und ihre Bedeutung für die wirtschaftliche Lage der Bevölkerung in der Stadt Halle," Verein für Sozialpolitik, *Schriften*, Vol. 145 I, (Munich and Leipzig, 1914), p. 70; Erich Sperling, *Arbeitslohn-Entwicklung in Handwerk und Industrie* (Rostock, 1907), p. 76; Ernst Behrendt, *Die Arbeits- und Lohnverhältnisse in einer mittleren Maschinenfabrik Ostpreussens* (Giessen, 1930), *passim*.

CHART 10
Skill Differentials and Cost of Living, 1871-1944



Shaded areas represent business contractions.

Skill differentials are differences between wages of skilled and unskilled workers, expressed in percent of the former.

Source: Appendix Tables A-1 and A-14.

during the second half of the pre-1913 period initiated a trend which continued for many more decades, as will be recounted shortly.

In tracing the course of skill differentials during the period before World War I, no comment has been offered upon the extent of the differentials or their variations from industry to industry. In fact, the significance of such measures is hard to interpret. A measure of the extent of skill differentials in any industry depends heavily upon the particular occupations selected to represent the broad skill groups. Particularly among skilled workers, we find a wide variety of occupations, and of wage rates even within the same occupation.⁵ Also in the group of so-called unskilled workers there are considerable differences in the training required for helpers—as, for example, in printing establishments compared with textile factories. Even “common labor” is no truly homogeneous class. Thus, evaluation of the actual size of skill differentials and comparison of their variation between industries is, at best, complex. And, in view of the meager factual information available for the period before 1913, meaningful interpretation is impossible.

1913-1945. From 1913 on, skill differentials underwent a series of drastic changes. We are fortunate in having, for this last prewar year, a fairly representative estimate. In twelve industries (nine manufacturing, with building, mining, and railroads), hourly wages of unskilled workers amounted to about 60 percent of those for skilled workers, with a resultant differential of about 40 percent.⁶

The movement of skill differentials for the period 1913-24 is illustrated by data on wage rates for building and railway workers. After the outbreak of World War I, the gap between wages of unskilled and skilled workers

⁵ The following tabulation illustrates the variation of rate levels even for skilled workers of the same occupation within a single factory. It gives daily wage rates (in marks) in a rolling mill in western Germany, 1892:

	<i>Maximum</i>	<i>Minimum</i>
1st roller	5.40	4.30
2nd roller	4.95	4.06
1st heater	6.00	4.80
2nd heater	5.60	4.30
Planer and sawer	4.60	3.80
Feeder and changer	4.20	3.40
Loader	3.80	3.20
Casting dresser, adult	3.10	2.70
Casting dresser, 18-20 years old	2.50	2.00
Casting dresser, 16-18 years old	2.00	1.60
Errand boys, less than 16 years old	1.60	0.60

Source: T. Bödiker, “Arbeitslohnstatistik,” *Preussische Jahrbücher*, Vol. 71, No. 2 (Berlin, 1893), p. 244.

⁶ These differentials are based on the union rates compiled by the Statistische Reichsamt (see Appendix Table A-14, Part III, col. 4). For 1913 the published wages represent in part hourly rates and in part hourly earnings. However, within each industry the same type of wage measure is used in the computation of differentials.

diminished rapidly. Whereas the differential between the wages of unskilled and skilled railway workers was 31 percent before the war, it had dropped to 18 percent by 1918. A similar development occurred among building workers. For Berlin, Hamburg, and Stettin, the average skill differential in building narrowed from 25 percent before World War I to 10 percent in October 1918. The decline in these differentials continued

TABLE 18
Skill Differentials, Based on Average Weekly Wage Rates in Eight Industries, 1913, and April 1922 to June 1924

Year and Month	Units of Columns 2 and 3 (1)	Wage Rates		Differentials ^a (4)
		Skilled (2)	Unskilled (3)	
1913	marks	35.02	24.31	30.6
1922	Apr. marks	889	802	9.8
	July marks	1,477	1,345	8.9
	Oct. marks	4,981	4,459	10.5
	Nov. marks	8,939	7,974	10.8
	Dec. marks	15,680	14,187	9.5
1923	Jan. marks	24,855	22,529	9.4
	Feb. marks	62,221	55,915	10.1
	Mar. marks	77,672	69,836	10.1
	Apr. marks	78,948	70,970	10.1
	May marks	100,345	90,025	10.3
	June thousand marks	246	220	10.6
	July thousand marks	974	874	10.3
	Aug. thousand marks	25,303	22,586	10.7
	Sept. thousand marks	632,000	561,000	11.2
	Oct. billion marks	244	211	13.5
	Nov. billion marks	16,540	14,231	14.0
	Dec. rentenmarks	28.81	24.27	15.8
1924	Jan. rentenmarks	27.31	22.87	16.3
	Feb. rentenmarks	28.12	23.08	17.9
	Mar. rentenmarks	29.13	23.21	20.3
	Apr. rentenmarks	31.54	24.43	22.5
	May rentenmarks	33.75	26.16	22.5
	June rentenmarks	35.52	27.16	23.5

^a These differentials are differences between wage rates of skilled and unskilled workers, expressed in percent of the former.

SOURCE: International Labour Office, *Studies and Reports*, Series D, No. 15, pp. 148-49. For November and December 1922 see "Zahlen zur Geldentwertung in Deutschland, 1913 bis 1923," *Wirtschaft und Statistik*, 1925, p. 42. See also Appendix Table A-44.

through most of the following period, the Great Inflation. Thus by 1922 the skill differential seems to have almost disappeared. For 1913, part of 1922, 1923, and part of 1924, the trend of skill differentials can be judged on the basis of broader inquiries (see Table 18). If we average the data for

eight industries (five manufacturing, with building, mining, and railroads), we find that unskilled workers received 70 percent of the wages of their skilled colleagues in 1913, about 90 percent in 1922, and a little less in 1923.⁷

With the stabilization of the currency, skill differentials widened again, without reaching prewar proportions. Wages for unskilled railway workers (which in 1922 had been within 6 percent of those for skilled) were 22 percent below skilled workers' wages in 1924. Over the average of twelve industries for which union rates are available in 1913 and in 1924-25 (see Appendix Table A-14, Part III, col. 4), skill differentials changed from a little under 40 percent before the war to just below 25 percent after stabilization. From 1925 on, skill differentials can be judged on the basis of the broad union rate statistics, covering twelve and, after 1928, seventeen industries.⁸ No drastic changes in skill differentials occurred during the last two decades of the history we are following. The skill differentials for male workers in all industry changed from 23.4 percent in 1925 to 21.5 percent in 1929, and 20.6 percent in 1933, remaining at that level throughout most of the National Socialist period. Only insignificant changes, within the range of 1 percent, took place in the course of World War II.

The reduction of skill differentials in the immediate poststabilization period was well-nigh universal. The tabulation on page 86 shows that in all ten industries for which skill differentials can be computed, the difference between rates of skilled and unskilled workers declined from 1913 to 1924. The situation is less simple during the subsequent years. While the over-all measure of wage rates, as indicated above, shows a slight decrease of differentials between 1924 and 1929, and again between 1929 and 1933, conditions varied somewhat from industry to industry. In the industries listed we find a decrease in only three of the ten between 1924 and 1929, and in three of the eleven between 1929 and 1933.

Some Determinants of Skill Differentials. The fact that there are skill differentials is not difficult to explain. Employers are willing to pay higher rates for skilled workers because they are more "productive." Skilled workers, in their turn, demand more payment per unit of work time—compared with that paid to unskilled—to compensate for their investment in training and experience. Thus both the demand and the supply curves for skilled labor lie above those for unskilled workers.

More complex than the explanation of the existence of skill differentials is the interpretation of their size. As pointed out above, the numerical

⁷ This tendency toward a slight widening of the gap in wages as related to skills during the last year of the Great Inflation can be observed also among the railway workers. It is confined to wage behavior during the last two or three months of 1923, when wages were negotiated in terms of stable "gold marks."

⁸ For the period 1925-28 wage rates for skilled and unskilled workers are estimated on the basis of the twelve-industry sample. However, the estimates were derived by "back-casting" wage rates from the average levels of the larger seventeen-industry samples in 1928. Thus, the differentials reflect estimated conditions in all seventeen industries even for the early years.

quotient depends largely on the selection of representative occupations. But this is a technical matter, the question here being to what extent the differential between the chosen occupations actually reflect differences in skill. It is clear that, in the short run, the relative scarcity of skilled and unskilled workers should affect the relation between the supply schedules.

Skill Differentials
(differences between wage rates of skilled and unskilled, expressed in percent of the former)

	1913-14 ^a	1924 ^b	1929	1933
Hard coal mining	56	43	37	37
Metalworking	26	18	20	21
Building	25	22	21	20
Papermaking	22	21	21	24
Printing	19	17	13	17
Woodworking	31	15	18	...
Textiles	22	16	17	16
Brewing	19	11	12	12
Baking	20	15	15	15
Chemicals	19	12	17 ^c	...
Soft-coal mining	...	...	14	12
Paper products	...	...	26	26
Pottery	...	...	17	17

^a For 1913-14, based on hourly earnings except for building, woodworking, brewing, and printing.

^b Differentials of averages for January, April, July, and October.

^c Differential of averages for October and April.

SOURCE:

1913-14 and 1924: Computed from data published in *Jahrbuch* 1924-25, pp. 277 ff., and *Jahrbuch* 1928, p. 371. However, wage rates of skilled and unskilled workers given in that source were linked to the revised series, with the January 1928 ratio used as adjustment factor. For 1929 and 1933: Computed from data in *Vierteljahrshefte zur Statistik des Deutschen Reichs*, 1931, n, pp. 105 ff., and *Wirtschaft und Statistik, passim*.

However, the wage differentials may have become so rigid that they cease to reflect such short-term changes in relative availability. Moreover, even over longer periods, custom or control over supply (limited apprenticeships) may keep differentials below or above the amounts warranted by differences in productivity, training costs, or other elements closely related to skills.

It is possible to identify some of the causes for changes in skill differentials. In Chart 10, which presents also a cost-of-living series, one may observe a rather close relationship between variations in skill differentials and changes in price levels. In general, rising price levels tend to be associated with narrowing differentials, and vice versa. Specifically, the period of falling price levels, 1874 to about 1886, was accompanied by widening skill differentials. During the period from the latter date to 1913, and still

more during the era of World War I and the Great Inflation, retail prices rose rapidly while the gap in wage rates as between skilled and unskilled workers narrowed. The stabilization of 1924 brought prices back from their fantastic heights but left them above 1913 levels. Correspondingly, skill differentials reappeared to a significant extent, remaining smaller, however, than they had been before World War I. Also from 1924 to 1929 the observed relationship holds; a retail price rise was accompanied by a moderate decline in differentials. But after 1929 the comparison breaks down, for skill differentials became practically rigid, maintaining their levels despite the fluctuations in retail prices—or, for that matter, in wage rates. On the whole, prior to the Great Depression and the advent of National Socialism, the correspondence between prices and skill differentials is striking, and may well suggest an economic relationship between the two measures.

In what manner can price trends affect skill differentials? For certain short-term periods the connection is fairly obvious. Take, for example, times of national emergency characterized by strong inflationary trends, by a decline of real wages toward socially tolerable minima, and by scarcity of essential commodities. In such periods wages for unskilled workers need more and prompter protection against increasing living costs. In periods of general prosperity, accompanied by rising price levels, the need for protection is less acute, though labor-market pressures apparently bring about mild decreases in differentials. On the other hand, in periods of falling prices, usually times of sluggish business activity, skilled workers may be better able to defend their wage levels. The form of wage adjustments also may contribute to the correlation of price change and skill differentials. If, during periods of rising prices, wage adjustments are made "across the board" in terms of equal sums of marks and pfennings, the low-paid workers benefit by a greater percentage change, and there is consequently a decrease in skill differentials.⁹ Changes in price levels, though of primary importance, do not provide the entire explanation for changes in skill differentials. For example, during the first decade and a half of our period, wages of skilled workers increased more rapidly than those of unskilled, thus widening the differential. While prices declined during that period, the change in skill differentials can hardly be attributed to this factor. In this case the increase in the skill gap should rather be explained by the fact that the initial industrialization of Germany created more acute shortages for skilled than for unskilled labor.

One might assume also that unionization would affect skill differentials. For example, during the period 1890 to 1913, when union organization increased but was restricted largely to skilled labor, one might expect to

⁹ See two publications of the International Labour Office in *Studies and Reports*, Series D, "The Workers' Standard of Life in Countries with Depreciated Currencies," No. 15 (Geneva, 1925), pp. 48-51; and "Wage Changes in Various Countries, 1914 to 1925," No. 16 (Geneva, 1926), p. 13.

find that the spread between skill differentials had widened. However, during that period, skill differentials actually narrowed, so that any possible influence of growing unionization of the skilled must have been obscured by other elements. We have noted that the rising costs of living and the decreasing hours of work during the fifteen years preceding World War I created strong pressures toward relatively larger wage increases for low-paid workers.

During World War I and the Great Inflation, prices affected wage developments to such an extent that they must be recognized as a dominant factor also in the trend of differentials. At the same time, we cannot disregard the influence of the government on wartime wages or the tendency of the Weimar Republic to give special protection to low-paid wage earners in the race between wages and rising retail prices. In the post-stabilization era, further factors must be considered. Before World War I, there had been a steady influx of unskilled labor from the countryside to the cities. This movement was dwindling after the war, leaving unskilled workers at least temporarily in an improved bargaining position.¹⁰ Furthermore, unionization, which before the war was restricted largely to skilled workers, now also embraced the unskilled. At that time even the unions of skilled workers favored the lessening of skill differentials. This was not so much an expression of egalitarian attitudes, but rather reflected the belief that higher wages for the unskilled might act as a deterrent to the introduction of laborsaving machinery and the revision of operations. Again, the slight narrowing of the differentials from 1924 to 1929 might be understood in terms of increasing retail prices and changing labor market conditions. But it is true also that technological improvements during the rationalization period (which followed the stabilization of the currency) freed some skilled labor or made it more easily dispensable, with a resultant deterioration in the comparative bargaining position of skilled workers.¹¹ The relatively high degree of stability in skill differentials after 1929, despite major wage changes, is due to the technical routine of wage setting. During the later 1920's only base rates for specific skill and age groups, so-called *Ecklöhne* (see note to Appendix Table A-2), were determined in negotiations, arbitration, or collective orders. Wages for other skill groups maintained their prior percentage relation to the *Ecklöhne*, the proportions changing only in case of hardship adjustments. This explains the mildness of the fluctuations in skill differentials during the subsequent years, including the era of National Socialism and World War II.

¹⁰ *Ibid.*, No. 15, pp. 48-51. The reduced influx of unskilled workers was cited as contributing to lesser skill differentials during the inflation, but affected also later years. Note, however, that during the late 1920's, higher unemployment rates tended to nullify the stated advantages.

¹¹ See Fritz Prerauer, "Untersuchungen der Spanne zwischen den Löhnen von gelernten und ungelernten Arbeitern, unter besonderer Berücksichtigung der Vorkriegszeit," *Weltwirtschaftliches Archiv*, 1929, pp. 390*-91* (Jena).

AGE DIFFERENTIALS

Age differentials may relate to rates or to earnings. In rates, age differentials occur usually between adult and young workers, not among adults. In earnings, however, such differentials can be traced throughout the whole age distribution of wage earners, for earnings levels are related to length of experience in a specific field, to seniority, and to physical age. These differences are frequently interwoven with differences in occupation and job function; within strictly comparable occupations and functions age differentials in earnings seem relatively small.

Usable information on age differentials within the group of adult workers is scarce. More accessible to statistical analysis are wage differentials between youths and adult workers. The group of young workers represented a very important, though gradually declining, portion of the German labor force.¹² As late as 1907 male youths under 20, including both apprentices and regular workers, constituted almost a quarter of all male wage earners, but by 1933 only about one-tenth.¹³ As will be seen presently, important wage differentials existed between youths and adults. Frequently such differentials obtained also between youths, young workers in the next higher age groups, and older workers.

Wages for Youths, Excluding Apprentices. Historically, substantially lower wage payments for youthful workers were the rule whenever young boys or young girls were employed in industrial occupations. Gröber¹⁴ reports that before World War I girls under 16 years of age, working in the hosiery industry of the Erz Mountains, received two-thirds to five-sixths of the wages for female workers over 16. For the period after World War I, Soecknick¹⁵ finds that young textile weavers in Thuringia earned 41 percent of adults' wages when they were 14 to 16 years old, 63 percent when they were 16 to 18 years old, 84 percent when they were 18 to 20 years old. The age differentials reported for textile workers in Silesia during 1920 were basically similar.¹⁶

¹² Factory work for children was progressively curtailed in the course of German industrial development. In 1832 it was prohibited in Prussia for children under 6 years of age, a limit later raised to 9 years. In 1854 the limit was 10 years, later raised to 12. In 1891 a federal law amending the *Gewerbeordnung* prohibited, outright, factory work of children under 13 years of age and, conditionally, under 14 years. That is, children between 13 and 14 could do light factory work under 6 hours per day in states that did not have compulsory schooling up to that age (Bavaria, Württemberg). The census of 1895 reports 215,000 children under 14 years old as regularly employed, but only 38,000 in factories. See Max Schön, "Die Erwerbstätigkeit der Kinder unter 14 Jahren," *Verein für Sozialpolitik, Schriften*, Vol. 36, 1898, pp. 174 ff.

¹³ *Statistik des Deutschen Reichs*, N.F. 211, p. 12*, and N.F. 453, III, p. 16.

¹⁴ Rudolf Gröber, *Nominallohn und Reallohn; Untersuchung über die Löhne in der erzgebirgischen Strumpfindustrie von 1889 bis 1913 und von 1924 bis 1928*. (Greifswald, 1932), p. 74.

¹⁵ Margarete Soecknick, "Die Entwicklung der Reallöhne in der Nachkriegszeit, dargestellt an typischen Thüringer Industrien," Jena Universität, Wirtschaftliches Seminar, *Abhandlungen*, Vol. 18, No. 1, p. 50.

¹⁶ Herbert Böhm-Münsterberger, *Die Entwicklung der Löhne gewerblicher Arbeitnehmer im Breslauer Wirtschaftsgebiet* (Gelnhausen, 1933), p. 14.

Provisions for age differentials in wage rates were not confined to youths proper. Up to 23 or 24 years of age such differentials frequently appeared in union contracts. In the printers' agreement of 1902, for instance, the weekly rate for book printers of 24 years or over was 25 marks; for those of 21 to 24 years it was one mark less; and for those under 21, two marks less. Also, in the agreements of the Weimar Republic and the collective wage decrees of the National Socialist period, union rates were established for adults (over 22, over 23, over 24, or whatever the age limit chosen),¹⁷ and younger workers received less by a percentage which, from about 1925 on, was seldom changed. For textile workers in Baden, age differentials for men and women covering all age groups between 14 and 25 years and the whole period from November 1923 to June 1933 can be computed. Table 19 gives a selection of these groups and

TABLE 19
Age Differentials Based on Hourly Rates of Unskilled Textile Workers in
Baden, 1923-1933
(Differences between the wage rates of the highest age group, adults over
23, and those of the other groups, expressed as percent of the former)

Contract Period	AGE GROUPS				
	14 years	16 years	18 years	20 years	23 years
	MALE WORKERS				
Nov. 5, 1923–Nov. 26, 1923	74	67	48	22	11
Jan. 7, 1924–Mar. 31, 1924	66	59	47	22	12
June 2, 1925–Jan. 1, 1927	60	54	40	20	8
Nov. 14, 1927–Mar. 30, 1931	58	53	40	20	7
May 3, 1932–June 26, 1933	60	54	40	21	8
	FEMALE WORKERS				
Nov. 5, 1923–Nov. 26, 1923	68	58	47	32	16
Jan. 7, 1924–Mar. 31, 1924	57	48	39	26	17
June 2, 1924–Jan. 1, 1927	49	43	35	19	11
Nov. 14, 1927–Mar. 30, 1931	47	42	36	20	11
May 3, 1932–June 26, 1933	49	44	36	21	10

SOURCE: Computed from data given by Walter Jehle, *Die Arbeiterlöhne in der badischen Textil-Industrie seit der Stabilisierung der Mark 1923-1933*, (Lörrach-Stetten, 1935), p. 113.

periods. The most obvious feature is the spread of wage rates according to age during any period, and for both males and females. In an extreme case, rates for boys of 14 were only about a quarter of those for unskilled male adults of 25 years or over. We find, moreover, that in all age groups and for both sexes, the prevailing tendency over time is toward a diminution of age differentials, expressed as a percent of wage rates for adults. The major declines in age differentials took place in the period 1923 to 1925, with later variations less marked and not always in the same direction. The declines were, as might be expected, more drastic for the younger age groups, whose wages were lowest. For the groups up to 18 years,

¹⁷ See, for instance, *Jahrbuch* 1928, pp. 365-69, footnotes.

age differentials were more pronounced in the case of males. This distinction becomes blurred for the 20-year-old workers and is reversed for the 23-year-olds.¹⁸

The narrowing of age differentials through wage increases for younger workers was a standing demand of organized labor; the reasons were not entirely humanitarian, since low wage rates for young workers constituted a check on the wages of adults. The union goals were met in two ways. First, the progressive age restrictions on work of children and youths reduced the percentage of young workers employed. Second, the increasing coverage of union agreements regularized the payments to youthful workers and cut down the abuses frequently connected with their employment. Although systematic comparative information on wages of young workers before and after World War I is lacking, there can be little doubt that their relative situation improved markedly between the time of the Reich's foundation and the period of the Weimar Republic. After the seizure of power by the National Socialists the established protection of children and youths against unfavorable working conditions seems to have been relaxed. The annual reports of German factory and mine inspectors during the Nazi period contain cases reminiscent of the conditions of early industrial capitalism.¹⁹

Compensation for Apprentices. Presumably the payment apprentices receive is not intended simply as compensation for work, but takes into account the training supplied by the employer. During the preindustrial era of Germany the latter aspect dominated the relationship, for the apprentice paid a "premium" or fee to the master. The old custom of apprenticeship, which usually meant rooming, boarding, and working with the master, deteriorated with the rise of industry. The *Gewerbeordnung* of 1869, together with the establishment of *Gewerbefreiheit* (freedom of trade), also introduced the right of craftsmen or industrial organizations to train workers—without limitation as to number, without specification of training standards, and without any rules pertaining to compensation. The result was a complete disorganization of training procedures, with grave effects upon industry and labor. The problem of providing skilled workers for growing industrial requirements, aggravated by the tendency of employers to use apprentices as a source of cheap labor (in household

¹⁸ A partial explanation of this curious reversal lies in the fact that age differentials for women are based largely on varying experience and skill. In the case of unskilled male workers, variations in physical strength form an important additional factor in the relative worth of laborers. While the great difference in physical strength between 14-year-olds and adults explains the larger age differentials among males, the negligible difference in strength between 23- and 25-year-old men accounts for the relatively small differential between these two age groups.

¹⁹ See Jürgen Kuczynski, *Germany under Fascism, 1933 to the Present Day*, (Vol. III, Part 2, of *A Short History of Labour Conditions under Industrial Capitalism*, London, 1944), pp. 136-145. From the case histories in these reports it is difficult to judge how widespread the reported abuses were, and particularly how their frequency compared with that of earlier periods.

or shop), prompted early investigations, both public and private. An inquiry into the apprenticeship system was directed by the *Bundesrath* during the early 1870's. The ensuing report, in addition to a detailed description of the shortcomings of the prevailing system, provided the following summary on remuneration:

"Apprenticeship fees seem to be used much less frequently. Sometimes they have no other purpose than to buy a reduction of apprenticeship years. Whenever such fees are paid, the apprentice lodges with the master. When the apprentice lives elsewhere, he pays fees only in exceptional cases. He even receives *Kostgeld* (board expenses) from the employer which, under certain circumstances, comes close to a wage payment. Apart from this, actual wage payments are rare."²⁰

A series of amendments to the *Gewerbeordnung*, the most important of which is the *Novelle* (amendment) of 1897, brought about decisive improvements in apprentice training and curbed many of the grosser abuses of *Lehrlingszüchtung* (apprentice breeding). But it left the question of remuneration entirely untouched. Thus a wide variety of arrangements continued to exist. Shortly before World War I, some apprentices in highly desirable trades still paid fees. In rural communities room and board were often provided, but rarely in cities. Cash wages became increasingly common. In 1905-06, of 1095 apprentices in Freiburg, about half received cash wages. No statistical summation of apprentice wages is available, but scattered information indicates that the pay ranged from small amounts of pocket money to sums comparable with those earned by young workers who were not apprenticed.²¹ In certain large establishments, apprentice wages had been firmly established for decades, progressing from nominal payments in the first year to wages approximating those of apprenticed adults in the last year.²²

²⁰ *Ergebnisse der über die Verhältnisse der Lehrlinge, Gesellen und Fabrikarbeiter auf Beschluss des Bundesraths angestellten Erhebungen*, zusammengestellt im Reichskanzleramt (Berlin, 1876), page v (translation mine). An increasingly close relation between the *Kostgeld* paid to the apprentice and an ordinary wage payment is stressed by other contemporary observers. Frequently apprentices completed their training only if paid, since they could earn ordinary wages as young factory workers. Parents were said to have their share of responsibility for the decay of training standards, because many of them apprenticed their sons only where they could earn money immediately. Masters, on the other hand, had to get their money's worth if they were to pay instead of being paid. Therefore they regarded the apprentice arrangement as a labor contract rather than a training system. Some employers had scores of apprentices and offered relatively high remuneration, which indicates that apprentices were in fact a desirable low-cost labor supply. See J. Brinckmann, "Lehrlingswesen," *Verein für Sozialpolitik, Schriften*, 1875, pp. 96-99. The problem of *Lehrlingszüchtung* (apprentice breeding) for profit is historically described by J. Altenrath in "Das Lehrlingswesen und die Berufserziehung des gewerblichen Nachwuchses," *Zentralstelle für Volkswohlfahrt, Flugschriften*, No. 7, 1912, pp. 48-50.

²¹ See Bernhard Jauch, *Das gewerbliche Lehrlingswesen in Deutschland seit dem Inkrafttreten des Handwerkergesetzes vom 26. Juli 1897, unter besonderer Berücksichtigung Badens* (Freiburg im Breisgau, 1911), pp. 39-44.

²² For some early arrangements of this sort see Robert Garbe, *Der zeitgemässe Ausbau des gesammten Lehrlingswesens für Industrie und Gewerbe* (Berlin, 1888), p. 119.

The decisive changes in apprentice remuneration came with the coverage of these payments by collective bargaining contracts. The trend had already started before World War I, particularly in the printing industry and occasionally also in building. It became more widespread after the war. There arose considerable legal controversy as to whether the apprenticeship relation could be subject to collective bargaining. Actually, however, about three-fourths of all collective agreements in 1923 did cover some aspects of apprenticeship, including remuneration. For the first few postwar years, unapprenticed youths were in general better paid than apprentices—though rates for apprentices increased with age and years of experience. Piece rates were paid only in the last year or half-year of apprenticeship, or to unapprenticed youths shortly before they could command adult wages. Finally, within each group—that of apprentices and that of young unapprenticed workers—there was a wide spread of wage rates.²³

On the whole, the long-term trend during the early postwar period was toward better training of apprentices, less exploitation, and more adequate remuneration. One of the achievements of the Weimar Republic was improvement of standards in training apprentices, adjustment of their number to the needs of each industry, and introduction of higher and more uniform rates of pay.²⁴ To sum up, over the entire period under review apprentices as well as youthful workers were able to improve their wage levels in relation to those of skilled adults.

SEX DIFFERENTIALS

Nature and Extent. Women's wages in Germany were always markedly lower than men's. An inquiry into working conditions of women and children in the years, 1874-75, found that earnings of most women workers were 5 to 8 marks per week (with extremes as low as 2 and as high as 19 marks).²⁵ Wages for men were considerably higher during those years.

²³ "Lehrlinge und Jugendliche im Tarifvertrag," *Reichsarbeitsblatt* 1923, pp. 223-30. The basic relation of apprentice payments to other rates may be shown by an example. In contracts for the building industry, apprentice wages were expressed in percent of the rate for skilled workers. In 1930, the following schedule was in effect for building apprentices in Berlin:

<i>During:</i>	<i>Percent of Pay of Skilled Adults</i>
First half year	10
Second half year	15
Third half year	20
Fourth half year	30
Fifth half year	40
Sixth half year	50

Source: Deutscher Baugewerksbund, *Jahrbuch* 1930 (Berlin, 1931), pp. 460-61.

²⁴ E. Schindler, "Lehrlingswesen," in *Handwörterbuch der Staatswissenschaften*, 4th edition, pp. 315 and 321.

²⁵ *Ergebnisse der über die Frauen- und Kinderarbeit in den Fabriken auf Beschluss des Bundesraths angestellten Erhebungen*, zusammengestellt vom Reichskanzleramt (Berlin, 1876), p. 11.

In medium-sized cities unskilled building workers earned about 13 marks per week, skilled builders and printers close to 20 marks (see Appendix Tables A-3 and A-5). About forty years later, shortly before the outbreak of World War I, a study of average daily earnings for men and women in twelve industries showed the weighted average of women's daily earnings to be 2.28 marks, that of men's earnings to be 5.17 marks. According to these figures, women's earnings in March 1914 were about 44 percent of the average for men.²⁶ Another twenty-five years later, in 1939, a weighted average of men's weekly earnings in sixteen industries was 45.14 marks, that of women 22.93 marks.²⁷ All these computations show that women as a group, throughout the existence of the Reich, earned at best about half of men's wages. To the extent that the data are comparable at all, they suggest further that during the period as a whole, there occurred no drastic changes in the relation between men's and women's earnings, but only a moderate improvement in the earnings of women relative to those of men.

We must recognize at the outset that the foregoing comparisons have little to do with the relation of rates or earnings received by men and those received by women in the same occupation for the same type and amount of work. First of all, the comparisons are based on extremely broad wage classes. Second, the earnings averages for men and for women were computed without taking into account the concentration of women workers in low-wage industries such as textiles, clothing, paper products, and foods. Third, no allowance was made for the fact that, in more industries than not, women's work was predominantly unskilled or semi-skilled. It is still true, however, that such comparisons provide valuable over-all information on women's wages which would be lost if the data were standardized with regard to industry, occupation, skill, and other relevant factors. Moreover, while analysis of women's and men's wages could be confined to specific industries, it would be extremely difficult to restrict it also to comparable occupations and skills. Typically, men and women within each industry perform different operations. Only in a few cases, as in segments of the textile, clothing, tobacco, and some other industries, are men and women assigned to the same sort of work. Thus, in most comparisons, the reported gross sex differential will derive also from differences in occupation and skill which cannot be measured separately. In fact, even within the broad groups of skilled and unskilled

²⁶ *Reichsarbeitsblatt* 1917, p. 643. Since the weighting (by employment) is not the same for men and women, the wage differential reflects also the different industrial composition of the male and the female work force.

²⁷ Estimated. For published data on average weekly earnings of skilled and unskilled men, and of women, in September 1937, see *Wirtschaft und Statistik*, 1938, p. 160. Approximate weights for skilled and unskilled workers were derived from information published in *Vierteljahrshefte zur Statistik des Deutschen Reichs*, 1931, Vol. II, pp. 97 and 101. For changes in earnings between September 1937 and the year 1939, according to the indexes published by the Statistische Reichsamt, see *Wirtschaft und Statistik*, 1938-40, *passim*.

workers, the comparisons will typically reflect occupational as well as residual skill differences for which no special gauge can be constructed.²⁸ With the nature of the differentials in mind, let us now review the findings.

1871-1913. Prior to World War I, there was a wide range in sex differentials, varying with industry and occupation. There is little evidence of a systematic change in differentials from 1880 to 1913—the period for which information is available in continuous series. (See Appendix Tables A-15 and A-16.)²⁹

In some occupations, mainly in the textile industry, men and women were performing the same operations. Typically these were piece-rate jobs and the rate was the same for both sexes, although in most cases the earnings of the men were higher than those of the women.³⁰ It happened, of course, on occasion that women working at the same jobs and at the same rates made more money than men.³¹ In these instances, particularly if the character of the operation made it likely that women's earnings would exceed those of men, a special premium was sometimes paid to men, so that their earnings would match or surpass those of their women co-workers.³²

Women played a minor role in mining operations. However, the excellent records available on shift earnings of men and women workers in coal and ore mining provide one of the few opportunities of comparing women's and men's earnings over an extended period before 1913. The data presented in Appendix Table A-17 show that between 1886 and 1913 women averaged about 40 to 60 percent of the shift earnings of men working above ground.³³ The table shows also that, in four of the five mining centers, the gap between shift earnings of male and female surface workers tended to increase—the only exception being ore mining west of the Rhine. This tendency appears also, albeit to a smaller degree, from a comparison of women's earnings with those of skilled underground miners. The upward trend in women's shift earnings during the thirty years preceding World War I obviously did not match that of male workers.

1913-1945. World War I ushered in a wide diversity of wage movements.

²⁸ Such comparisons, moreover, will be greatly influenced by the occupations chosen and possibly by the classification of borderline occupations as skilled, semiskilled, or unskilled.

²⁹ It will be observed that in the cotton spinning industry in Hof the comparison is within the same skill group. For the printing industry and for hosiery production in the Erz Mountains, however, the comparison is between unskilled females and skilled males. This factor, of course, affects the size of the respective wage gaps.

³⁰ Agnes Karbe, "Die Frauenlohnfrage," *Hamburger Wirtschafts- und Sozialwissenschaftliche Schriften*, No. 6 (Rostock, 1928), p. 23. In the cited case the difference for weaving was slightly above 10 percent.

³¹ See, for instance, *Der Arbeiterfreund*, 1877, p. 442.

³² Max Weber, "Psychophysik der industriellen Arbeit," *Archiv für Sozialwissenschaft und Sozialpolitik*, Vol. 28, (Tübingen, 1909), p. 268.

³³ Although shift earnings of men above ground include the earnings of some skilled mechanics, these were predominantly earnings of workers possessing less skill than the average underground miner.

Despite this diversity, broad averages in major industries show a rather consistent though moderate narrowing of the gap between earnings of men and women. In March 1914 the weighted average of women's earnings in twelve industries was 44 percent of that for men. This proportion rose to 48 percent by September 1918, but declined somewhat in March 1919.³⁴ The decrease in the sex differentials was rather uniform, occurring in nine out of twelve industries. In two of the other three (leather and rubber) the differentials remained constant, and in only one industry (electrical goods) they increased.

After World War I sex differentials broadened temporarily, but did not again become as large as they had been before the war. In the course of the inflation years, the differentials again tended to narrow. Table 20, which presents data on sex differentials in the textile industry, indicates that before the war, women's rates were about two-thirds of those for men, for both skilled and unskilled workers. At the peak of the hyperinflation, skilled women received about three-quarters of men's rates, unskilled women only slightly less. By the end of 1923, the gap had widened again, remaining a little below prewar size in the case of skilled workers, but somewhat larger in the case of unskilled. The last column of the table expresses wage rates of skilled men minus rates of unskilled women as a percentage of those of skilled men. Since these quotients do not show a wider gap at the end of the inflation than before the war, they suggest that it was only the particularly rapid increase of rates for unskilled men which prevented women from improving their position vis-à-vis that group.

The poststabilization adjustment brought about a slight narrowing of sex differentials between the beginning and the end of the year 1924. This reduction was a little more pronounced among unskilled than among skilled workers and was closely linked to the gradual adjustment of skill differentials to their postinflation levels. Sex differentials for skilled textile workers narrowed by less than 2 percentage points, those of unskilled workers by 3 percentage points between January and September 1924. Changes in sex differentials of workers in the paper products industry were in the same direction and of similar magnitude. Differentials for unskilled stone cutters changed from 54 percent in January 1924 to 42 percent in July 1925.³⁵

After 1925, sex differentials remained fairly stable up to the end of the period under review. This finding is based on the union rate statistics,

³⁴ *Statistik des Deutschen Reichs*, Vol. 293, p. 18; and *Reichsarbeitsblatt*, *passim*. See also footnote 26 above.

³⁵ Differentials for textile and paper product workers are computed from unrevised data published in *Wirtschaft und Statistik*, *passim*. Since the original data are not adjusted to the revised series, the levels of the differentials are not comparable to those shown in Table 21. Differentials for stone cutters are from data given in *Deutscher Bauwerksbund, Löhne und Arbeitszeit im Baugewerbe in den Jahren 1914 und von 1924 bis 1930* (Berlin, 1912), p. 10.

TABLE 20

Sex Differentials, Based on Wage Rates in the Textile Industry, 1913, and
April 1922 to September 1924
(Differences between men's and women's wages, expressed as percent of the former)

<i>Year and Month</i>	<i>Skilled Workers</i>	<i>Unskilled Workers</i>	<i>Unskilled Women Compared with Skilled Men</i>
1913	33.7	32.7	45.1
1922 Apr.	26.5	27.8	38.7
July	24.8	28.5	35.9
Oct.	23.1	26.5	35.0
Nov.	23.3	26.9	36.0
Dec.	23.1	24.3	32.9
1923 Jan.	23.6	26.5	33.8
Feb.	25.4	28.7	36.1
Mar.	24.7	28.4	36.2
Apr.	24.9	28.8	36.6
May	25.0	29.1	36.5
June	25.0	30.1	37.5
July	23.8	27.7	35.2
Aug.	24.6	30.8	37.5
Sept.	22.7	26.2	34.3
Oct.	26.9	33.3	40.3
Nov.	30.9	38.1	45.1
Dec.	30.7	36.8	44.9
1924 Jan.	29.5	32.8	42.8
Feb.	28.5	31.0	42.8
Mar.	29.5	31.4	44.5
Apr.	28.8	30.9	44.2
May	27.4	28.0	41.9
June	27.9	34.4	42.4
July	28.0	28.8	42.5
Aug.	28.0	28.8	42.5
Sept.	28.2	29.1	42.8

SOURCE: Computed from data published in International Labour Office, *Studies and Reports*, Series D, No. 15, pp. 148-149. For November and December 1922, see "Zahlen zur Geldentwertung in Deutschland, 1913 bis 1923," *Wirtschaft und Statistik*, 1925, p. 42. See also Appendix Table A-44.

which permit the computation of sex differentials for a few industries from 1924 on, and for a great variety of industries from 1928 on.⁸⁶ In 1929 the differential was least among cotton weavers (18 percent), greatest among skilled stationery makers (42 percent). Such industrial differences must, of course, be interpreted in the light of earlier remarks on occupational

⁸⁶ Detailed information for the years 1928, 1930, and 1935 is contained in Elisabeth Oehlandt, "Deutsche Industriearbeiterinnen-Löhne, 1928-1935," *Hamburger Wirtschafts- und Sozialwissenschaftliche Schriften*, Vol. 36 (Rostock, 1937), p. 22.

classification. From 1928 to 1933 sex differentials declined slightly and then stayed approximately constant to the very end of the National Socialist period. The stability of sex differentials during the last two decades of Reich history is mainly attributable to the mechanics of collective bargaining. Usually only a representative base rate was negotiated and the percentage change in the wage level was applied "across the board" to other rates, including those of women. The established relation between men's and women's wages was maintained by the wage-rate stabilization under National Socialism.

TABLE 21

Sex Differentials, in Three Industries, Selected Years, 1913-1943
(Differences between men's and women's wages, expressed as percent of the former)

Year	TEXTILES			PAPER PRODUCTS			STONE CUTTING	
	Skilled Workers (1)	Unskilled Workers (2)	Unskilled Women	Skilled Workers (4)	Unskilled Workers (5)	Unskilled Women	Unskilled Workers (7)	Unskilled Women
			Compared with Skilled Men (3)			Compared with Skilled Men (6)		Compared with Skilled Men (8)
1913	22	16	41	48	30	53	54	59
1924	17	19	38	41	38	54	45 ^a	52 ^a
1926	18	18	37	40	36	51	41 ^a	46 ^a
1929	17	19	38	40	37	53	40 ^a	46 ^a
1932	16	21	38	41	38	54	..	..
1943	16	22	38	43	38	53	..	..

^a July.

SOURCE:

Cols. 1 to 6 computed from data in *Wirtschaft und Statistik, passim*. Original data from 1913-27 linked to new series in 1928. This linking affects the level but not the movement of the differentials.

Cols. 7 and 8 computed from data in *Deutscher Bauarbeiterbund, Löhne und Arbeitszeit im Baugewerbe in den Jahren 1914 und von 1924 bis 1930* (Berlin, 1912), p. 10.

In some industries—textiles, paper products, and stone cutting—post-inflation differentials can be compared with those obtaining before World War I. The results are found in Table 21. In 1913 sex differentials within skill groups varied widely—from 16 to 54 percent. The gap narrowed between that year and the poststabilization period for skilled workers, but it widened in two of the three presented series for unskilled. However, wage rates of both skilled and unskilled women increased in relation to those of skilled male workers between 1913 and 1924. This generalization finds additional support in the differentials computed by Margarete Soecknick for the textile, pottery, and metal industries in Thuringia. Table 22 presents the differentials of skilled and unskilled women's wage rates and those for skilled men (in percent of the latter). Comparison of the differentials in 1914 and 1926 shows a more pronounced decline in sex differentials than that observed on the basis of the more comprehensive series, given in Table 21.

TABLE 22

Sex Differentials, in Three Industries in Thuringia, 1914, 1920, and 1926
(Differences between wages of skilled men and of women in indicated skill groups, expressed as percent of the former)

Year	TEXTILES		POTTERY		METALWORKING
	Skilled Women	Unskilled Women	Skilled Women	Unskilled Women	Skilled and Unskilled Women
1914	30	43	60	65	56
1920	10	34	34	45	48
1926	20	30	40	47	43

SOURCE: Margarete Soecknick, *Die Entwicklung der Reallöhne in der Nachkriegszeit* (Jena, 1927), p. 75.

Throughout German wage history sex differentials were marked. Before World War I, women's wages on the average were probably about half of those for men, an average covering a wide dispersion, with most differentials falling between 30 and 60 percent. No definite trend in actual net sex differentials can be observed for that period, although gross differentials probably narrowed somewhat. However, there were noticeable changes after 1913 and up to about 1925: between those years the gap between wage rates of men and of women narrowed, albeit to a moderate extent. A decrease of about 15 percentage points would probably be a generous estimate of the change.³⁷ During the last two decades of the Reich's existence sex differentials remained virtually stable.

An Interpretation of Sex Differentials. Differences in physical strength and in physiological aptitudes can help to explain some of the observed differentials in wages as between men and women in Germany. But there are many other causes, among them lack of educational facilities for girls and a tendency to disparage mechanical abilities of women, which contributed to a differential in aptitudes that was essentially more cultural than physiological in origin. The extent of sex differentials in Germany was closely related also to prevailing social institutions and to specifically German attitudes. Woman "belonged" at home, where her status was subordinate to that of her husband or father, the "*Herr im Haus*." She was held to be inferior in industrial work and suited only for occupations requiring little skill and responsibility. The only exceptions observed occurred in the textile factories, in which women frequently held skilled positions. Since a woman's opportunities for work were so severely limited, she could not develop any serious interest in a career. Girls who worked in factories usually left their jobs upon marriage. Thus, up to

³⁷ Karbe (*op. cit.*) assumes a decrease of roughly 20 percentage points. Oehlandt (*op. cit.*) is not convinced that any narrowing of the gap can be definitely discerned. However, the material presented here leaves no doubt that wages of women improved in relation to those of men.

World War I, there were relatively few women workers. The unions made little headway in attempting to organize them. Nor did women have any say in politics until the revolution of 1918 gave them suffrage.³⁸ While discrimination against women in industrial work was not restricted to Germany, it was probably more pronounced there than in the other large industrial countries.

The war experience and the establishment of the Weimar Republic brought about decisive changes in the economic position of German women. War needs sharply increased the employment of women, who proved their aptitudes in occupations traditionally closed to them and even found supervisory positions. Also, wage rates had to be set high enough to attract women workers to the labor force and to specific industries and jobs. The results were significantly higher rate and earnings levels for women, accompanied by declining differentials. The Weimar Republic improved educational facilities for women and encouraged liberal ideas concerning their place in home and society. Along with increased organization of female labor, job openings became more plentiful for women, partly as a result of technological changes.³⁹ The wage demands of women were affected by growing experience and improved quality of work as well as by their more pressing need to support themselves and their families. War deaths and disabilities had robbed many families of male providers and lessened the marriage opportunities of women. Although such circumstances tended to increase the female labor supply, the improved status and augmented requirements of working women seem to have been countervailing factors. All these changes found expression in narrowing differentials.

The question arises then, why, in view of these radical changes in social and economic conditions, was the reduction of sex differentials so slight? Perhaps the most important reason is that the interwar years were marked by large-scale unemployment, even in the relatively prosperous late 1920's. By the time the employment of women in well-paid jobs had become possible, their chances of obtaining such positions were impaired by widespread unemployment and by growing resentment against *Doppelverdiener* (two earners in one family). Indeed, during the early years of National Socialism, the reconversion of female workers into *Hausfrauen* became a widely publicized part of the government's campaign to create employment for men. And in later years, when rearmament and mobilization necessitated the recall of women into the labor market,

³⁸ For a detailed discussion of the determination of sex differentials in Germany, see Karbe, *op. cit.*, Chapters III and VI. See also A. Salomon, "Die Ursachen der ungleichen Entlohnung von Männer- und Frauenarbeit," *Staats- und Sozialwissenschaftliche Forschungen*, Vol. 122 (Leipzig, 1906).

³⁹ Anna Schwarz, *Das Verhältnis zwischen Frauen- und Männerlöhnen in Deutschland vor und nach der Revolution 1918* (Basel, 1925), an analysis mainly based on wages in the textile industry and hospital services. See also Isa Strasser, *Frauenarbeit und Rationalisierung* (Berlin, 1927); and Karbe, *op. cit.*, Chapter XII.

the wage-stabilization policy prevented the increased demand for women workers from affecting their wages.

Differentials Relating to Place of Employment

CITY-SIZE DIFFERENTIALS

Nature and Extent. Large cities like Berlin and Hamburg ranked consistently high in terms of wage levels, while in small cities like Rostock workers received lower wages in the same industries and occupations.⁴⁰ To what extent did variations in size of city affect wage levels, and what were the trends of city-size differentials in Germany up to 1945?

In printers' contracts, throughout the history of the Reich, city-size variations were a major basis of wage differentiation. During the early decades collective agreements in the printing industry provided that in cities with a population over 25,000 the basic rate should be augmented. A special wage commission established increases: of 20 percent for Berlin; 15 percent for Hamburg, Leipzig, Stettin, and Stuttgart; 8.5 percent for Munich; 5 percent for Halle and Karlsruhe. In cities below 10,000, on the other hand, the workers could be asked to concede about 8 percent.⁴¹ In later wage agreements before and after World War I the principle of city-size differentials was maintained.

Although such differentials were not as fundamental a part of wage arrangements in other industries as they were in printing, their prevalence in a large variety of industries can be established from Table 23 for December 1929. Without a single exception, hourly wage rates were highest in Berlin (population 4,024,000), intermediate in Krefeld (131,000), and lowest in Siegen (31,000). The average of forty-two occupations represented in the three cities shows wage rates in Krefeld to have been 12 percent lower, and those in the small city of Siegen to have been 20 percent lower than rates in Berlin.⁴²

The only existing large-scale inquiry into city-size differentials was conducted for one point in time—September 1, 1941.⁴³ The investigation related to average hourly earnings actually paid. The summary results, presented in Table 24, show a clear tendency of hourly earnings to

⁴⁰ See, for instance, Appendix Tables A-4 and A-5.

⁴¹ Third collective agreement in the printing industry, dated from January 1878 on. See Robert Kuczynski, *op. cit.*, pp. 567-68.

⁴² The averages for Krefeld and Siegen do not encompass all of the forty-two occupations covered by the inquiry. On the basis of the fourteen occupations cited in Table 23 which are reported for all three cities, average wage rates in Siegen were 77 percent, and in Krefeld 87 percent of those in Berlin. However, Siegen, although a small city, lies in a highly industrial northwestern section of Germany, the so-called Siegerland. The differential for most small cities, including those in rural areas, would presumably be wider.

⁴³ *Wirtschaft und Statistik*, 1942, pp. 425-28. This inquiry covers the Greater Reich, including Austria and other annexed areas, but the increased coverage does not impair the validity of the basic results.

TABLE 23

Average Hourly Wage Rates, Typical Occupations in Selected Industries and Cities, December 1929
(pfennigs)

	48 Cities	Berlin ^a	Krefeld ^a	Siegen ^a
<i>Skilled Occupations</i>				
Building	129	154	135	111
Painting	125	149	125	111
Brewing	118	129	118	95
Printing	118	122	120	115
Furniture	115	130	118	107
Baking	110	125	111	110
Leather	99	110	96	...
Paper	96	114	97	90
Metalworking	94	112	83	73
Shoe	90	92	...	...
Railway	85	107	84	78
Textiles	81	99	80	...
Chemicals	81	88	79	...
<i>Unskilled Occupations</i>				
Building	107	127	112	92
Brewing	107	115	106	86
Printing	98	107	99	95
Paper producing	84	94	85	...
Public utilities	82	98	87	82
Railway	68	85	67	62
42 occupations covered by inquiry ^b	107	125	110	100
14 identical occupations ^c	104	120	104	93

^a In 1925 the population of Berlin was 4,024,000; that of Krefeld was 131,000; and that of Siegen, 31,000.

^b Not all of the 42 occupations covered by the inquiry are represented in the average for each city.

^c The averages refer to the 14 occupations reported in this table, which are available for all 3 cities.

SOURCE: Allgemeiner Deutscher Gewerkschaftsbund, *Jahrbuch* 1930, pp. 342-57.

increase with size of city. With one exception (skilled males and skilled and semiskilled females in the third and fourth largest city-size group) this tendency holds between any two classes. Wages in the smallest city-size group (population under 10,000) are about 25 percent below those in the metropolitan group.⁴⁴

Trends in City-Size Differentials. Table 25 presents hourly wage rates of masons in cities for which information could be obtained, for the years 1887, 1913-14, and 1929. The cities are arrayed according to their size in

⁴⁴ Investigation of the twenty separate industries shows a similar general tendency toward association of high earnings with large cities, but exceptions to this rule are much more frequent than they appear in the over-all averages.

TABLE 24
Average Hourly Earnings in Cities of Varying Size, 1941

City Population (thousands)	AVERAGE HOURLY EARNINGS, SEPTEMBER 1941 (pfennings)				DIFFERENTIALS: ^a (percent)				DIFFERENCES: (pfennings)			
	Male		Female		Male		Female		Male		Female	
	Skilled (1)	Semi- skilled (2)	Unskilled (3)	Skilled and Unskilled (4)	Skilled (5)	Semi- skilled (6)	Unskilled (7)	Skilled and Unskilled (8)	Skilled (9)	Semi- skilled (10)	Unskilled (11)	Skilled and Unskilled (12)
Over 1,000	130.2	115.3	92.0	65.7	10.5	12.7	12.7	11.0	13.7	14.6	11.7	7.2
500-1,000	116.5	100.7	80.3	58.5	16.9	14.1	12.9	17.7	22.0	16.3	11.9	11.6
200-500	108.2	99.0	80.1	54.1	16.7	17.7	17.1	16.0	21.8	20.4	15.7	10.5
100-200	108.4	94.9	76.3	55.2	20.6	21.0	19.1	17.8	26.8	24.2	17.6	11.7
50-100	103.4	91.1	74.4	54.0	21.3	23.1	19.5	19.5	27.7	26.6	17.9	12.8
25-50	102.5	88.7	74.1	52.9	24.3	24.3	22.1	22.4	31.7	28.0	20.3	14.7
10-25	98.5	87.3	71.7	51.0	26.0	26.8	23.6	24.0	33.8	30.9	21.7	15.8
Under 10	96.4	84.4	70.3	49.9	26.0	26.8	23.6	24.0	33.8	30.9	21.7	15.8

^a The differentials are differences between earnings in the highest size-class and those in the other classes, expressed in percent of the former.

SOURCE: Cols. 1 to 4, *Wirtschaft und Statistik*, 1942, p. 426. Survey includes areas incorporated into the Reich after 1937.

TABLE 25
Hourly Wage Rates of Masons in Cities of Different Size, 1887,
1913-1914, and 1929

City	POPULATION (thousands)		HOURLY WAGE RATES (pfennigs)		
	1885 (1)	1925 (2)	1887 (3)	1913/14 (4)	Apr. 1929 (5)
Berlin	1,315	4,024	50	82	148
Hamburg	306	1,079	50	88	150
Leipzig	170	679	40	74	134
Dresden	246	619	35 ^a	70	132
Frankfurt a/M	155	468	34	65	131
Hanover	140	423	38	71	129
Nürnberg	115	392	32	65	131
Chemnitz	111	332	28 ^b	60	132
Bremen	118	295	40	73	132
Magdeburg	114	294	37	62	125
Stettin	100	254	40	62	128
Elberfeld	106	168	32	66	132
Lübeck	55	121	35	70	132
Rostock	39	78	35	65	115
Quedlinburg	19	27	24	53	110
Average of 3 highest	597	1,927	47	81	144
Average of 3 lowest	38	75	31	63	119
Differentials ^c	93.6	96.1	34	22	17

^a 1886.

^b 1890.

^c The differentials are differences between data in the three highest and the three lowest cities, expressed as percent of the former.

SOURCE, by column:

(1) *Jahrbuch* 1891, p. 5.

(2) *Jahrbuch* 1929, pp. 10-12.

(3) Berlin, Hamburg, Leipzig, Frankfurt a/M, Hanover, Bremen, Magdeburg, Stettin, Lübeck: Franz Nast, *Arbeitszeit und Arbeitslohn im Baugewerbe*, p. 69.

Chemnitz: Verein für Sozialpolitik, *Schriften*, Vol. 145 iv, "Entwicklung der Preise in der Stadt Chemnitz," p. 211.

All other: Robert Kuczynski, *Die Entwicklung der gewerblichen Löhne seit der Begründung des Deutschen Reiches* (Berlin 1909), pp. 43, 47, 50, 52.

(4 and 5) Elberfeld, Lübeck, Rostock, and Quedlinburg: Deutscher Baugewerksbund, *Löhne und Arbeitszeit im Baugewerbe*, pp. 163, 175, 180, 148. All other cities: *Jahrbuch* 1926, p. 277; and *Jahrbuch* 1929, p. 259.

1925 (which corresponds fairly closely to an array based on city size in 1885). Analysis of the rates shows the high correlation between city size and wage rates in the three benchmark years.

As for trends, the table shows that the differentials, computed as percentages of Berlin and Hamburg rates, declined markedly over the forty-two-year period. This tendency is discernible between 1887 and 1913, and it becomes more pronounced during the period 1913 to 1929. The differentials between the three largest and the three smallest cities

(according to 1925 population) are 34 percent, 22 percent, and 17 percent of the three largest for the selected years. The trend toward a narrowing of city-size differentials is borne out by other evidence. The Statistische Reichsamt, in the evaluation of a different set of data, observes decreasing city-size differentials in masons' wages between 1900 and 1913, and between 1913 and later years—in fact up to World War II. *Wirtschaft und Statistik* states in 1942: “. . . Since the First World War, 1914-1918, wage rates have become more similar between size classes of cities. This tendency is particularly clear in case of building, but it is in no way confined to that industry.”⁴⁵ It is true, of course, that in comparing city-size differentials in wages for 1887 and 1929 we are dealing with cities that changed greatly both in size and in character. This does not, however, invalidate the importance of the change in differentials. The point is that relative differences in wages as between small and large cities became less in the course of time. The reasons for this decline in city-size differentials are discussed below.

Some Determinants of City-Size Differentials. The Statistische Reichsamt, in its interpretation of the data, considers the extent to which the greater earnings in large cities were absorbed by higher living costs.⁴⁶ The Reichsamt estimates that one-half or even more of the differential had to be spent for higher rents. Also, transportation costs tended to be greater in large cities. Higher food costs, on the other hand, were about counterbalanced by somewhat lower clothing costs. It is concluded that, even after adjustments for differences in cost of living, substantial differentials remain in real wages.

City-size differentials in wages can thus be traced only in part to differences in living costs. The greater productivity in the highly industrialized big cities and, by comparison, the perpetual economic difficulties of the agricultural areas may provide further explanation. Moreover, the existence of a surplus agricultural population, the concentration of labor-union activity in large cities, and finally, the greater availability of highly efficient workers in large industrial centers, are cited as contributing to city-size differentials. The available evidence does not, however, permit measurement of the relative importance of these factors.

City-size differentials have been shown to have decreased over time. Around 1887, wage rates for masons in small cities (population 19,000 to 55,000) were one-third below those in the largest cities, and wage rates in cities with populations under 10,000 were presumably still lower. By 1929 the comparable gap was 20 percent or less. Table 25, which presents this information, suggests also that the explanation for this tendency cannot be sought in a decreasing difference in the size of cities themselves. The large cities included in the array, in fact, grew faster than the small

⁴⁵ *Wirtschaft und Statistik*, 1942, p. 427 (translation ours). For additional evidence on the development of city-size differentials in building, see *ibid.*, 1931, p. 153.

⁴⁶ *Ibid.*, 1942, pp. 427-28.

cities, yet city-size differentials in wage rates shrank. It appears then, that the trend toward declining city-size differentials must be explained in terms of other factors. Among these is the trend toward greater equalization of living costs. Increasing reliance on manufactured consumers' goods and rising cultural standards in rural areas tended to narrow the gap between city and country with regard to both consumption patterns and prices. Pricewise, the substitution of manufactured for hand-made goods meant—for many commodities—lower prices for city dwellers (as compared with prices paid to craftsmen) and greater expense for the inhabitants of small towns (who may formerly have produced the goods themselves). Furthermore, the originally great differences between large and small cities in availability of efficient workers tended to diminish with the spread of education and with the establishment of industrial centers outside of large cities. Finally, after World War I, the growth of labor unions throughout the whole Reich area reduced another factor responsible for differences in wage rates paid as between large and small cities.

REGIONAL DIFFERENTIALS

Nature and Extent. Striking differences in wages paid in the several geographic regions of Germany are observable throughout the entire period under investigation. Data on average hourly rates for masons are available in about twenty areas for 1885, 1905, and 1929, and of unskilled workers in all industries for 1941 (see Appendix Table A-18). Table 26 summarizes the area information into (unweighted) wage averages for five large geographic regions.⁴⁷ The summary shows that in 1885, 1905, and 1929 the wage differentials between major German regions were considerable. The gap amounted to as much as 20 to 25 percent between the agricultural East and the highly industrialized Northwest. But also, as between other major regions, substantial differentials were maintained throughout the period up to 1929.

Ample corroborative evidence attests to regional differentials in other occupations and industries. An inquiry into international wage conditions conducted in 1905 by the London Board of Trade⁴⁸ revealed that skilled and unskilled building workers, printers, and municipal workers tended to receive higher wages in the North Sea ports and the industrial cities of the Northwest than in other regions. The lowest wages for these occupations were paid in the East, Silesia, and the Baltic ports.⁴⁹ Regional

⁴⁷ The coverage of these regions is indicated in Appendix Table A-18, where proximate areas of roughly similar economic character are combined.

⁴⁸ *Cost of Living in German Towns*, report of an inquiry of the London Board of Trade into working-class rent, housing, and retail prices, together with the rates of wages in certain occupations in the principal industrial towns of the German Empire (London, 1908), p. xxxii.

⁴⁹ In this inquiry the regional wage averages were based on quotations in a small number of large cities. Thus the differentials might reflect city type as well as regional characteristics. Since, however, wage rates even of large cities are affected by wage levels of the surrounding area, regional wage differences do emerge from these comparisons.

TABLE 26
Regional Differentials, Based on Average Hourly Earnings,
1885, 1905, 1929, and 1941

Region ^a	MASONS			UNSKILLED WORKERS
	1885 ^a (1)	1905 ^a (2)	1929 (3)	1941 (4)
EARNINGS (pfennigs)				
East	24	37	114	63
Central	27	43	124	79
South	28	40	136	76
Southwest	29	44	132	80
Northwest	32	51	139	82
DIFFERENTIALS (percent) ^b				
East	25	27	18	23
Central	16	16	11	4
South	12	22	2	7
Southwest	9	14	5	2
Northwest	0	0	0	0

^a 1885, 1905, Old Reich area; later years, Reich area of 1937.

^b The differentials are differences between wages in the Northwest and those in the other regions, expressed in percent of the former.

SOURCE: Appendix Table A-18.

differences are indicated further in a comparison of wages between the Breslau industrial district in Silesia and the Mannheim and Frankfurt districts in the Rhine area. Analysis of wage rates for comparable occupations in Breslau and the two other cities shows that the East-West differential obtained in several, though not in all, the industries covered in Table 27.⁵⁰

The only large-scale inquiry into the question of regional differentials was conducted by the Statistische Reichsamts for September 1941.⁵¹ The broad results of this investigation, arranged according to five large regions, are presented in column 4 of Table 26. Again, as in earlier years and for

⁵⁰ See Herbert Böhm-Münsterberger, *op. cit.*, *passim*. The existence of the East-West differentials is demonstrated in the textile, metal products, and woodworking industries, for which data are included in Table 27. The author finds similar differentials also in the clothing industry, for the interwar period; and in the brewing industry he finds a differential for the interwar period but not for 1913. These differentials are measured for comparable occupations in cities of roughly similar size. (The population of Frankfurt was 460,000, that of Breslau 550,000 in 1925.) Thus the measures refer to regional differentials in a strict sense.

⁵¹ Reported in *Wirtschaft und Statistik*, 1942, pp. 282-85. The Reich, for the purpose of this investigation, was divided into thirty regions. Included in these regions were the annexed portions of Poland and Czechoslovakia, and the whole of Austria. The large cities of Berlin, Hamburg, and Vienna were treated as separate units. The regional averages contained in the last column of Table 26 and computed in Appendix Table A-18 refer to the Reich area of 1937.

TABLE 27

Regional Differentials, Based on Wage Rates for Selected Occupations,
Breslau and Rhineland Cities, 1913 and 1929

	BRESLAU ^a		MANNHEIM-FRANKFURT a/M ^a		DIFFERENTIALS ^b	
	1913 (pfennigs)	1929	1913 (pfennigs)	1929	1913 (percent)	1929
Textile workers, male						
Skilled	28	59	40	70	30	16
Metalworkers, male						
Skilled	45	84	54	89	17	6
Unskilled	28	67	46	74	39	9
Woodworkers, male						
Skilled	40	105	60	125	33	16

^a The industrial district of Breslau lies in the Southeast, the cities of Mannheim and Frankfurt a/M in the western industrial parts of Germany. These three cities are of medium size, and have industrial suburbs. In 1925 their populations were: 550,000 (Breslau); 460,000 (Frankfurt); 246,000 (Mannheim).

^b The differentials are differences between wage rates in Breslau and the western cities, expressed in percent of the latter.

SOURCE: Herbert Böhm-Münsterberger, *Die Entwicklung der Löhne gewerblicher Arbeitnehmer im Breslauer Wirtschaftsgebiet*, 1933, pp. 15, 19, 20, and 24.

specified occupations, wages were highest in the Northwest and lowest in the East, the differential for the two regions being about 30 percent. The breakdown given in the original source permits us to conclude, moreover, that there was a tendency toward gradually decreasing earnings levels proceeding from West to East and, to a lesser extent, from North to South.

Trends in Regional Differentials. The data on wage rates for masons (Table 26) suggest that regional differences were significantly reduced in the course of the forty-four years covered.⁵² The greatest change occurred between 1905 and 1929, and presumably, as with other differentials, between the immediate prewar years and the poststabilization period. Also from Table 27 we can observe a decrease of regional differentials. Thus in the textile, metal, and woodworking industries, the narrowing gap between wages paid in Silesia (in or about Breslau) and in Southwest Germany (Mannheim or Frankfurt a/M) is clearly apparent. Whereas in the reported occupations the differentials in 1913 were about 15 to 40 percent, they had narrowed to 5 to 15 percent during the years of the Weimar Republic.⁵³

Some Determinants of Regional Differentials. The regional wage differentiation, which has been described, corresponds closely to the advanced

⁵² Since the differentials are highly sensitive to the particular grouping, only large and consistent changes can be accepted with confidence.

⁵³ The shrinking of the differentials cannot be explained on cyclical grounds for two reasons: first, 1913 and 1929 were both fairly prosperous years; second, in all cases except textiles, comparisons of 1913 and, say, 1932 also show a lessening of differentials.

industrialization of the West and North of Germany as compared to the South and East. The greater productivity of the West and the North permitted labor to attain higher average earnings. The predominantly agricultural East of Germany was not only backward in industrialization but also hampered by difficulties of transportation; the Polish Corridor was a severe obstacle to trading with the rest of the country; long hauls added to the prices of both incoming industrial wares and outgoing agricultural products. Furthermore, the tendency toward greater population increase, and therefore labor supply, in agricultural areas helped to perpetuate the low wage levels in East Germany.⁵⁴

Differences in freight costs, over and above differences in cost of living, have been held to explain the continuation of the East-West differentials. Perhaps this is too easy an explanation. For we find that wage differentials between the Breslau and Mannheim-Frankfurt areas narrowed despite persistent deterioration of the freight situation in Silesia.⁵⁵

The tendency toward decreasing regional differentials appears to have followed the gradual industrialization of the East and the South. Mechanization of agriculture, growth of cities, and establishment of new industries tended to reduce the differences in the character of the regions. Apart from these basic trends, policies of the government and of workers' and employers' organizations affected regional wage trends. Employers—and sometimes unions—in the low wage areas tried to hold on to their cost advantages. Employers and unions in high-wage areas sought to decrease wage differentials in order to avoid low-cost competition. The government supported the latter position as a matter of general policy.⁵⁶ The difference of interests between the regions was reflected in the diverging views on coverage of wage contracts. To return to the example: Employers in Silesia tried to avoid schematization, that is, inclusion of Silesian wage areas in nationwide agreements. Employers and unions outside Silesia, on the other hand, attempted to break the "ceilings" on prices and wages which stemmed from availability of cheap eastern merchandise. By refusing to "agree" in private bargaining processes, they could cause wage determination to be shifted to government arbitrators. The latter tended, in the name of social equalization, to set wage levels which reduced the gap between the East and other Reich areas.

INDUSTRIAL DIFFERENTIALS

Nature and Extent. German workers in similar skill, sex, and age groups differed from one industry to another in the wage rates they received.

⁵⁴ *Wirtschaft und Statistik*, 1942, p. 284-85. To a certain extent, the lower earnings were balanced by lower costs of food and housing in these areas. Also wage taxes, characterized by progressive rates, tended to be lower in the eastern part of Germany.

⁵⁵ The economic position of the Breslau area worsened after World War I. The cession of Upper Silesia meant loss of its nearby eastern markets. Competition in more distant western markets burdened outbound products with increased freight costs.

⁵⁶ See Böhm-Münsterberger, *op. cit.*, pp. 58-62 and 65-67.

TABLE 28
Hourly Wage Rates of Skilled and Unskilled Male Workers, by Industry, 1913, 1925, 1930, and 1939

Industry	1913			1925 ^a			1930 ^a			1939 ^a		
	Pfennigs (1)	Rank (2)	Increase over 1913 (percent) (5)	Pfennigs (3)	Rank (4)	Increase over 1913 (percent) (8)	Pfennigs (6)	Rank (7)	Increase over 1913 (percent) (11)	Pfennigs (9)	Rank (10)	Increase over 1913 (percent) (11)
<i>Skilled Workers</i>												
Coal mining	81.1	1	14	92.1	2	14	123.9	3	53	98.0	2	21
Building	70.5	2	36	95.9	1	100	141.0	1	100	92.7	4	31
Brewing	67.6	3	35	91.0	3	91	129.4	2	91	110.2	1	63
Metals	66.2	4	22	80.7	6	56	103.3	8	56	85.6	7	29
Woodworking	62.7	5	36	85.5	4	36	123.6	4	97	86.3	6	38
Printing	61.0	6	38	83.9	5	38	116.9	5	92	95.8	3	57
Chemicals	57.0	7	34	76.4	8	34	107.9	6	89	87.4	5	53
Baking	50.4	8	55	78.0	7	55	105.6	7	110	84.4	8	67
Paper products	48.2	9	44	69.4	9	44	97.2	9	102	78.2	9	62
Textiles	44.7	10	30	58.1	11	30	79.3	11	77	66.3	11	48
Papermaking	32.6	11	87	61.1	10	87	87.3	10	168	70.9	10	117
<i>Unskilled Workers</i>												
Building	55.7	1	43	79.7	1	43	116.2	1	109	77.9	3	40
Brewing	54.7	2	46	79.7	2	46	114.9	2	110	97.9	1	79
Printing	48.5	3	51	73.2	4	51	101.8	4	110	78.5	2	62
Chemicals	46.0	4	43	65.8	6	43	89.4	6	94	72.6	4	58
Woodworking	45.3	5	64	74.2	3	64	106.5	3	135	69.6	6	54
Metals	42.5	6	27	53.9	10	27	77.4	10	82	63.1	8	48
Baking	41.0	7	65	67.6	5	65	90.8	5	121	72.6	5	77
Coal mining	35.9	8	51	54.2	9	51	78.0	9	117	62.1	9	73
Paper products	35.6	9	66	59.0	7	66	82.7	7	132	65.8	7	85
Textiles	34.6	10	40	48.6	11	40	66.6	11	92	55.7	11	61
Papermaking	29.4	11	88	55.3	8	88	78.4	8	167	61.4	10	109

^a April.

source: 1913 and 1925, *Jahrbuch* 1929, pp. 266-67. Data for 1913 are earnings, except for building, brewing, woodworking, and printing; For 1930, *Jahrbuch* 1930, pp. 299-306. Minor impairment in comparability of wages for skilled paper makers between

1925 and 1930; For 1939, *Jahrbuch* 1939-40, pp. 353-60; spliced to old series in April 1930. Data for April 1930 from *Jahrbuch* 1931, pp. 284-93. For woodworking, coverage changes again in 1931; spliced on basis of overlap (see *Jahrbuch* 1934).

The information on industrial differentials for the years prior to 1913 is too scanty for reliable comparisons, but from 1913 on we can compare industry wage levels on the basis of union rates collected and published by the Statistische Reichsamt. Table 28 presents such rates for skilled and unskilled workers in eleven industries for 1913, 1925, 1930, and 1939. For skilled workers, coal mining, building, and brewing paid the highest rates; and paper products, textiles, and papermaking the lowest rates at each of the selected dates (except for 1939, when printing rates eclipsed those of building workers). The situation of unskilled workers cannot be described so simply. But here also a few industries (building, brewing, printing) consistently paid top rates while others (textiles, paper) always paid lowest rates. Although the rank, according to industry wage levels, is not the same in an array of rates for skilled and for unskilled workers, the general order is somewhat similar: building and brewing rank high, and paper and textiles rank low in both cases.

The Statistische Reichsamt published averages of wage rates paid in important centers of each industry. The selected centers may be mainly large cities, as with the building and the metal industry, or relatively small cities, as with textiles. Differences in the regional distribution of industries also affect the comparability of the Reichsamt data. The averages for the printing industry cover virtually the whole Reich; for the metal industry they are heavily weighted by western industrial centers; and for textiles they overrepresent southern and southeastern centers. In connection with the analysis of another type of differential, Table 23 presented union rates for a number of industries in a group of forty-eight cities (average) and in Berlin, Krefeld, and Siegen.⁵⁷ The table shows also that in the average for all forty-eight cities, as well as in the three cities selected for their extreme variation in size, there are characteristic differences in wage rates from industry to industry. Building, brewing, and printing rank high; paper, shoes, and textiles rank low. (Metal workers and railway workers show remarkably unfavorable averages, in view of the special skills required for many operations in these industries.)⁵⁸

The ranking cited above shows the industrial structure of minimum wage rates rather than that of rates actually paid or of average earnings. There

⁵⁷ The data are collected and published by the *Allgemeiner Deutscher Gewerkschaftsbund* (Free Trade Unions). Not all occupations are represented in all of the forty-eight cities. The more serious shortcoming in this respect is in textiles, for which eight cities are without representation. But the averages given at least attempt to equalize city coverage.

⁵⁸ Although this study is concerned primarily with nonagricultural industries, it is worth noting that wages in agriculture were typically lower than those paid in manufacturing, mining, or transportation. At the end of 1929, cash and noncash wage rates per hour in agriculture averaged about 42 pfennigs for men and 27 pfennigs for women (unweighted averages for sixteen major regions; see *Allgemeiner Deutscher Gewerkschaftsbund, Jahrbuch* 1929, p. 365; and 1930, p. 359). This compares with averages of 67 and 47 pfennigs for unskilled men and women in the low-paying textile industry. (Weighted averages for eighteen centers, Statistisches Reichsamt, *Jahrbuch* 1930, p. 304.)

are some suitable materials available for investigation of the earnings structure and its comparison with the minimum rate structure. One such body of data is provided by the inquiries carried through for separate industries during the years 1928 through 1932. Appendix Table A-19 summarizes the industrial rate and earnings averages derived from some of these inquiries and confronts them with the wage rates of comparable industries.⁵⁹ The comparison is carried through for time and piece rates in three major skill groups. The evidence shows, first of all, that the ranks occupied by industry averages do not vary greatly from skill group to skill group. The similarity of the industrial structure of each skill group allays any suspicion that the industrial differentials might be fortuitous. Second, and more important for present purposes, the ranks in the rates and earnings reported in the various inquiries are highly correlated, and in close correspondence with the relation of industry averages shown by the current union rate statistics.

Industrial differentials in both rates and earnings can be observed also from the regular quarterly publication of earnings for about a score of industries (available from 1936 on). In an effort to summarize the degree of correspondence in the industrial structure of rates and earnings, wage rates and hourly earnings for eleven industries, which could be matched approximately, are assembled in Table 29 for the year 1939. Despite some differences in the rank of individual industries, there was a fairly close similarity in the basic grouping. Brewing, hard coal mining, chemicals, and building tended to stay in the upper part of the array in rates and earnings for skilled and unskilled workers. On the other hand, textiles, pottery, and clothing tended to rank low in all arrays. The rank correlation between rates and earnings in the eleven matched industries is +0.79 for skilled workers, and +0.93 for unskilled.⁶⁰ This indicates a fairly close correspondence between the industrial structure of rates and earnings.

The finding of a fairly similar industrial structure of rates and earnings is particularly important in view of the fact that large deviations of rates from earnings in minor industrial subgroups⁶¹ have occasionally led to the conclusion that union rates give an entirely unrealistic picture of the effective wage structure. The rather high coefficients of rank correlation

⁵⁹ The selection of industries was restricted to those investigated between March 1928 and March 1929 in order to compare industry averages only within a roughly uniform economic climate. Of course, the mere passage of time may give an upward slant to wages investigated during the latter part of the period, since revisions of wage rates may have occurred. However, the advance of union rates during this period was moderate in comparison to the size of the industrial differentials. Another limitation of the comparison is the different coverage of the industry inquiries and the current monthly union rate statistics. Such differences refer both to industry definition and sample coverage.

⁶⁰ The rank correlation coefficients were computed as $1 - \frac{6\sum d^2}{n^3 - n}$, where d = difference between ranks, and n = number of industry groups.

⁶¹ A 70 percent excess of piece-work earnings over rates in the case of blast-furnace workers, for instance.

TABLE 29

Hourly Wage Rates and Earnings, Skilled and Unskilled Male Workers,
by Industry, 1939^a

Industry	SKILLED WORKERS				UNSKILLED WORKERS			
	Wage Rates		Earnings		Wage Rates		Earnings	
	Pfennigs	Rank	Pfennigs	Rank	Pfennigs	Rank	Pfennigs	Rank
Brewing	105.2	1	103.9 ^b	2	93.2	1	91.0	1
Hard-coal mining	95.5	2	101.1	3	60.3	5	72.9	4
Chemicals	87.1	3	104.0	1	70.1	2	80.1	2
Building	82.7	4	91.5 ^b	4	66.0	4	73.1	3
Baking	80.7	5	89.4	6	68.9	3	70.7	5
Shoes	79.2	6	83.5 ^c	8	...	...	...	...
Papermaking	75.9	7	73.8 ^b	10	57.3	7	68.2	7
Soft-coal mining	75.8	8	81.7	9	67.4	...	...	...
Clothing	74.1	9	91.0	5	47.9	...	...	...
Pottery	70.8	10	88.3	7	58.9	6	69.0	6
Textiles	63.6	11	73.6	11	52.1	8	58.9	8

^a Rates as of April, 1939, earnings for year 1939.^b Skilled and semiskilled workers.^c All production workers.SOURCE: Rates, *Jahrbuch* 1939-40, pp. 353-62. Earnings, *Handbuch* 1928-44, pp. 470-71.

in the 1939 comparisons are especially noteworthy, since wage rates in 1939 differed but little from their depression standing, while earnings reflected the effects of six years of rising business activity and employment levels under the special conditions of an armament boom.

Trends in Industrial Differentials. Apart from differences in wage levels, there are notable variations in the wage trends of different industries. For the period before World War I, the following tabulation shows percentage increases in a number of comprehensive wage series. The first column gives wage changes from 1871 to 1913, based on J. Kuczynski's indexes, which combine daily, weekly, and annual quotations. The percentage changes show a considerable spread. Reasons for the moderate increase in printers' wages may be found in two sets of facts. Workers in

PERCENTAGE CHANGES IN WAGE LEVELS

	1871 to 1913		1888 to 1913	
	(J. Kuczynski Indexes) (1)	(J. Kuczynski Indexes) (2)	(Grumbach-König Annual Earnings) (3)	
Building	+124	+67	+67	
Woodworking	+103	+70	+54	
Textiles	+97	+41	+59	
Metalworking	+86	+50	+68	
Printing	+63	+39	+18	
Mining	+51	+74	+92	

SOURCE: (1 and 2), Jürgen Kuczynski, *Germany 1800 to the Present Day*, pp. 131-32; (3) Appendix Table A-55.

this industry had been able to obtain comparatively favorable wage conditions at the beginning of the Reich's history. Furthermore, the introduction of the mechanical composing machine reduced the demand and the skill requirements for printers. We are less secure in interpreting the other trend differences. In mining, earnings in 1871 were relatively high—perhaps particularly so in the sample used—and the reduction in working hours was probably greater than average. In building, the effectiveness of even local organization of workers must have been an important factor in the early wage increases in this industry. All in all, for the period 1871-1913, the available information is not sufficiently representative to permit reliable generalizations as to the trend of industrial wage differentials.

For the period 1888 to 1913 we have both J. Kuczynski and Grumbach-König estimates of wage increases in the industries listed. Again we have a considerable spread between wage changes in various industries, particularly in column 3. In both estimates, wages of building workers and miners went up strongly, those of printers relatively little. But the correspondence between the industry measures in columns 2 and 3 is not close. Grumbach and König computed measures of variation among average annual earnings levels in the fourteen industries covered. They found the standard deviation of industry averages to be 23.4 in 1890, but only 18.3 in 1913.⁶² This shows a substantial contraction of industrial differentials during the prewar period.

From 1913 on, trends in industrial wage differentiation can be traced on the basis of hourly union rates.⁶³ The percentage increases from 1913 to 1939 are shown in column 11 of Table 28. In the table the industries are ranked according to wage levels in 1913. For both skilled and unskilled workers the industry with the lowest pay in 1913 (papermaking) received the highest percentage increase, and the industry with the highest pay (coal mining for skilled workers, and building for unskilled), the lowest percentage increase. A simple measure of variation for all eleven industries—for both skilled and unskilled workers—shows a decided decline of industrial differentiation from 1913 to 1925, and from 1925 to 1939.⁶⁴ Between April 1925 and April 1930 the industrial differentiation

⁶² F. Grumbach and H. König, "Beschäftigung und Löhne der deutschen Industrie-wirtschaft 1888-1954," *Weltwirtschaftliches Archiv*, 1957, Heft 1, p. 140. The standard deviation measures are based on industry averages, expressed as relatives of their own mean. Thus they describe relative rather than absolute dispersion.

⁶³ For 1913, hourly earnings were used except for building, woodworking, brewing, and printing. See *Jahrbuch* 1928, p. 371, footnote 15.

⁶⁴ The measure consists of the average deviations (sign ignored) of the rates for each industry from their mean, divided by that mean and multiplied by 100.

	1913	April 1925	April 1930	April 1939
Skilled	18.3	12.2	13.6	10.4
Unskilled	15.7	14.7	14.9	11.9

The decline of industrial differentials after 1913 is also borne out by the study of Grumbach and König, *loc. cit.*

increased somewhat, presumably for cyclical reasons. The long-term trend from 1913 to 1939 is doubtless toward greater equality among wage rates paid in various industries.

The Statistische Reichsamt summarized its statistics of industrial wage rates for producers' and consumers' goods up to 1931.⁶⁵ Trend differences between hourly wage rates in producers' and consumers' goods emerge from the following tabulation:

WAGE RATES (1913 = 100)				
	Producers' Goods		Consumers' Goods	
	Skilled	Unskilled	Skilled	Unskilled
1913	100	100	100	100
1925, April	125	147	145	153
1929, April	166	205	196	206

Producers' goods industries paid higher wages than industries making consumers' goods—a difference that was more marked for skilled than for unskilled workers.⁶⁶ Thus the percentage increases are highest where prewar levels are lowest, and vice versa. Again, the increasing equalization of wage levels is the most conspicuous long-term tendency.

Some Determinants of Industrial Differentials. In the investigation of industry differentials it is particularly important to realize that these measures are not "pure", that is, they do not isolate the effects of different industrial conditions from those of other factors. The effect of location in large or small cities, and in agricultural or industrial areas, has already been mentioned. Other differentials also, such as those deriving from skill and sex, affect the industrial wage structure. This is true even if inter-industry comparisons are made within the same major skill-sex groups, since these groups are too broad to exclude the skill factor effectively. Hence the industrial differentials actually compare wage rates for somewhat subjective categories of "typical" skilled and unskilled workers in the various industries. Furthermore, the selection of so-called representative occupations influences the industrial comparison. For example, it makes a substantial difference for interindustrial comparisons whether the tool- and diemaker or the turret-lathe operator is chosen to represent skilled workers in the metal industry. Finally, the attempt to choose a typical occupation provides no assurance that the resultant rate is close to the

⁶⁵ Producers' goods include mining, metals, chemicals, building, woodworking, papermaking, and printing. Consumers' goods include textiles, brewing, baking and paper products.

⁶⁶ Before the outbreak of World War I, producers' goods industries paid 69 pfennigs for skilled workers, and 42 pfennigs for unskilled. Consumers' goods industries paid 40 pfennigs for skilled, and 32 pfennigs for unskilled (see *Jahrbuch* 1928, pp. 371-72). Between 1913 and 1929 wage rates in consumers' goods industries advanced more than those in producers' goods industries. The difference is particularly striking among skilled workers, but also observable among unskilled workers.

mean or mode of the total distribution of skilled or unskilled workers in a given industry. The skill factor might be thought to be negligible if industrial comparisons are based on wage rates for unskilled workers. This is not necessarily true, however. The printer's helper may be required to do a more complex job than, say, the helper in the baking industry. Furthermore, the term skill must be understood here in a broad sense. Typically, more physical stamina is needed in mining and building than in textile production or printing. An industrial differential might well appear as a consequence of differences in aptitudes of this type.

Even if industrial differentials could, to a considerable extent, be resolved into regional, city-size, skill, sex, and age differentials, it would still be valuable to measure their combined effect. Moreover, different industries have economic characteristics that affect wage levels independently of the other differentials mentioned. Some industries, for instance, may enjoy a relatively high degree of protection from sharp competition, because they are essentially local (like building and brewing), or because imports of competitive products from foreign countries carry high tariffs (like some chemicals and metals), or because they are largely cartel controlled (like coal and coke, iron and steel, chemicals, some electrical goods, building materials, etc.). These sheltered industries are less subject to price pressures and may therefore be better able to afford a liberal wage policy than highly competitive, unsheltered industries such as textiles, clothing, or foods. Then too, other factors specific for particular industries, such as dominance of large establishments, heavy capital investment, steep growth trends, high productivity, strong seasonal variations, large cyclical amplitudes, dangerous or disagreeable working conditions—all these may find reflection in industrial wage differentials.

The generally high wages in building, brewing, and (for skilled workers) mining must be related at least in part to the combination of aptitude, experience, and stamina required by the major occupations in these industries. The need for intelligence and long experience probably also goes far to explain the relatively high levels of printers' rates. By comparison, textiles, foods, and papermaking require less of these qualifications. It must be noted, however, that some of the high-wage industries also happen to be those more heavily concentrated in industrial centers with high living costs. They tend to be characterized by heavy capitalization and high productivity and, on the whole, to be more largely cartel dominated and more thoroughly unionized. Some of these high-wage industries also are industries with large fluctuations in employment. In the case of brewing and building, strong seasonality is obvious. In building, hard coal mining, and most subgroups of the metal industry, the cyclical instability of employment may require some compensation in the form of higher wage levels.

We find, then, a marked correlation among the cited determinants of wage levels. This correlation is not fortuitous. Heavy industries with large

capital investment tend to require a highly skilled and responsible labor supply. Such a labor supply is more likely to congregate in industrial areas and close to large cities. The heavy fixed costs and the durability of their products make these heavily capitalized industries cyclically sensitive and increase their need for protective market control. The above elements—high skills, large establishments, concentration in industrial centers, and strong organization of employers—make for powerful unions and high wage demands; and employers' control of product markets enables them to pursue relatively liberal wage policies. The correlation of the several wage determinants leads to the grouping of wages into broad categories, with producers' goods industries predominating in the upper part of the wage scale, and consumers' goods industries in the lower part. However, the correlation is far from perfect and the factors are combined in varying proportions. Thus consumers' goods industries like brewing and printing appear in the upper segment of the wage array, and sawmill products in the lower segment.

The reasons for the narrowing of industrial differentials in the course of time must be sought in the changes that took place in the conditions accounting for these differentials. It has been pointed out that to some extent industrial differentials reflect differences due to other factors, such as skill, sex, age, location. The narrowing of wage differentials based on these factors as previously described must thus find expression in the trend of industrial differentials. Also, differences in some purely industrial characteristics, that were formerly pronounced, tended to become milder. For instance, during the early decades of the Reich's history and probably up to World War I, consumers' goods industries operated with very low capital investment. This situation changed with the increasing use of machinery and the growing size of establishments in consumers' goods industries. The change affected both productivity and cyclical sensitivity in these industries. Moreover, unionization, which before World War I was concentrated in a few industries, permeated the whole industrial field after the war. It would be difficult to describe the trends in less tangible conditions, such as differences between industries in the degree of protection and market control. Indeed, some of the factors making for industrial wage differentiation may well have grown in importance. After all, industrial differentials did not disappear; they continued to be an important aspect of the German wage structure. It may well be asked how it is possible that industrial wage differentials in a local labor market can be maintained over an extended period. Theoretical considerations might lead one to expect that even if there is no short-term substitutability of industrial skills, competition of workers for jobs in the high-wage industries should in the long run tend to equalize wages for comparable skills in different industries. There are, however, important obstacles to a proper functioning of such competitive mechanism. Entry into the skilled trades of the high-wage industries may be limited by control of apprentice

training. The employment capacity of the high-wage industries may be too small to constitute a sufficient incentive for a large influx. Greater job security in the cyclically less sensitive consumers' goods industries may play a role. Finally, the availability of women workers and young workers characterizes the labor supply picture of the light industries and tends to perpetuate their lower wage levels.

The investigation of wage differences deriving from such factors as skill, age, sex, city-size, region, and industry has shown that such differentials generally tended to shrink over the long period under review. All long-term changes point to a leveling-out of sharp differences, and to a greater measure of equality in the wage structure. We find that most of these differentials narrowed in rough conformity to the social and economic inequalities from which they stemmed.

The period of greatest progress in this wage equalization extended from 1913 through the late 1920's—during the transition from the Kaiserreich to the Weimar Republic. It would seem plausible that the changes in economic, social, and political climate brought about by the Revolution of 1918 were mainly responsible for the trends toward equalization. It must be realized, however, that there were in operation long-term forces which helped to bring about this equalization process—forces which also created the conditions for the Revolution and the emergence of democratic institutions. Among these forces were the progressive industrialization of Germany, the urbanization of the countryside, the spread of general education and industrial training, the introduction of mass-production technology with its reduced requirements for select handicraft skills, and the gradual spread of unionism throughout all industries, areas, and skill groups. Industrialism tends to equalize living conditions, productive capacities, and economic requirements. In this process it also fosters equality in the wage structure.