UNITED STATES DEPARTMENT OF LABOR
L. B. Schwellenbach, *Secretary*
BUREAU OF LABOR STATISTICS
Aryness Joy Wickens, *Acting Commissioner*

Factors Affecting Earnings in Chemistry and Chemical Engineering

Bulletin No. 881

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Washington 25, D. C. - Price 10 cents

Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., July 8, 1946.

The SECRETARY OF LABOR:

I have the honor of transmitting a bulletin presenting the results of a survey of factors affecting earnings in chemistry and chemical engineering in 1943. The bulletin was prepared in the Bureau's Occupational Outlook Division for use in vocational counseling of veterans, young people in schools, and others considering the choice of an occupation. The study was prepared by Cora E. Taylor, under the supervision of Harold Goldstein. The Bureau wishes to express appreciation to members of the staffs of the American Chemical Society and the National Roster of Scientific and Specialized Personnel for their helpful comments on the report. The Bureau assumes full responsibility for the analysis of the data.

ARYNESS JOY WICKENS, *Acting Commissioner.*

Hon. L. B. SCHWELLENBACH,
Secretary of Labor.

Contents

Bulletin No. 881 of the

United States Bureau of Labor Statistics

[Reprinted from the MONTHLY LABOR REVIEW, June 1946, with additional data]

Factors Affecting Earnings in Chemistry and Chemical Engineering

Summary

THE incomes of persons employed in chemistry and chemical engineering vary widely, depending on the type of work done, the amount of education, and the years of experience, as well as on individual abilities. These factors were evidenced in the results of two surveys of the economic status of those engaged in chemistry and chemical engineering in 1941 and 1943.

In making these surveys, no attempt was made to define membership of the chemical profession; the surveys included reports from persons who stated that they were employed in the fields of chemistry or chemical engineering. Persons who performed routine work in such jobs as testing were included, as well as those who advanced through research and production into administrative positions requiring executive ability in addition to a knowledge of chemistry. This is reflected, in part, in the wide range of earnings. The report, therefore, is not intended to show the earnings of members of the chemical profession as such. Information on the economic status of those working in the field in the many different types of jobs which may be open will be helpful in the guidance of young people and veterans interested in appraising the possibilities open to students of chemistry, and in planning their education.

Most of those working in the field had college training in chemistry or chemical engineering: the combined data show that about 87 percent of those reporting had at least a bachelor's degree in either of these fields; an additional 6 percent had no degree, but had taken at least some college courses in chemistry or chemical engineering; another 3 percent had degrees in some other field of science or engineering.

The chemical manufacturing industries employed nearly two-thirds of all those in the field of chemistry, and about 82 percent of those in chemical engineering. Those employed in chemistry were engaged chiefly in analysis and testing, industrial research, and technical administration; other major fields were teaching, production, development, research in basic science, and technical service. In chemical engineering, highest proportions were employed in technical administration or production work; large numbers were also engaged in development, industrial research, technical service, and design. In general, administrative jobs paid the highest salaries; technical service and industrial research paid more than analysis and testing or secondary school teaching.

There was a marked tendency for the earnings of chemists holding a doctor's degree to exceed those of persons employed in the field of chemistry at the same age or experience levels and holding a master's or bachelor's degree, or none. This was true to a lesser extent, and less consistently, among chemical engineers.

Charts and tables accompanying this report indicate clearly that years of experience are a major factor in differences in earnings.

Earnings reported for 1943 were higher than in 1941. The median base monthly salary of those employed in chemistry increased by 21.5 percent and in chemical engineering by 26.4 percent, in the 2-year period. There is some evidence that salaries have advanced further since the time of the survey.

Scope and Method of Survey

Early in 1944, the Bureau of Labor Statistics, in cooperation with the American Chemical Society, made a survey of the economic status of members of the society by means of a questionnaire mailed to all members.[1] At approximately the same time the Bureau also made a sample survey of persons employed in the field of chemistry and chemical engineering who were not society members. After the elimination of members of the armed forces and those reporting a field of employment other than chemistry or chemical engineering, there were about 19,000 questionnaires in the sample of American Chemical Society members, and 2,500 in the sample of nonmembers. Taking the two groups as representing, respectively, the total membership and the total number employed in the field who were not members of the society, weights were established to give the two groups their proper proportions as related to the total estimated number of persons employed in chemistry and chemical engineering in 1943. Information from reliable sources placed the total number of chemists at about 71,000 and of chemical engineers at about 26,000, as of January 1944.

It is difficult to decide who ought to be included in a survey of a professional field. Professional society memberships are likely to include a higher proportion of those who have succeeded in their profession than of those who have been relatively unsuccessful; on the other hand, an attempt to correct this bias may dredge up large numbers of persons on the fringe of the profession and hence equally bias the figure in a downward direction. The fact is that some professions as fields of economic opportunity are not precisely definable. On the one hand, the young college graduate is often assigned to a variety of routine jobs of a subprofessional sort, serving, as it were, an informal apprenticeship. On the other hand, the more able young people with no more than a high-school education may rise to jobs of this sort and higher. The ceiling for those with little formal training is often higher than the floor for those with degrees. Beyond this fact of overlapping there is an enormous spread of professional capacity ranging from an undefined lower level of competence to a level that calls for genius or near-genius. The Bureau has tried, therefore, to include the complete range of capacities in the field of chemistry and chemical engineering.

[1] Professional Chemical Workers in War and Peace. An analysis of the economic status of the members of the American Chemical Society, 1941 to 1943, by Andrew Fraser, Jr. (Available in Chemical and Engineering News, issues of May 25, July 10, August 25, and October 10, 1944, or in reprint form from the Mack Printing Co., Easton, Pa.)

The sample for the nonmember survey was selected from among registrants in chemistry and chemical engineering in the files of the National Roster of Scientific and Specialized Personnel. The registrations are filed according to numbers which were assigned on a random basis. Approximately every sixth registration was examined and after omitting registrants who stated they were members of the American Chemical Society and those with inadequate addresses, a mailing list of 8,214 chemists and chemical engineers was obtained.

Two months were allowed for the return of completed questionnaires and at the end of that period there were 4,500 returns or 55 percent of the original mailing list. (See p. 21 for facsimile of questionnaire.) About 55 percent of those who returned questionnaires were employed in the fields of chemistry or chemical engineering in 1943. Many of the others were employed in other fields of science or engineering, were in the armed forces, or were members of the American Chemical Society although their registration data failed to show them as such.

In order to evaluate the extent to which the returns were representative of the randomly selected mailing list—an important question in any voluntary reporting survey—the date of birth was recorded from the National Roster files for each name selected, and the age distribution of the persons in the mailing list was compared with that of the respondents. It was found to correspond very closely except in the age group 24 to 30 years, in which the proportion of questionnaires returned was somewhat lower than for the other age groups. This was largely due to the fact that a high percentage from this age group was serving in the armed forces. The median age for the mailing list (chemists and chemical engineers combined) was 31.4 years, while the median age of all respondents was 32.4 years. A comparison of the geographical distribution of the mailing list and respondents was also made. There was almost no variation between the two groups in this respect.

Since this study is primarily concerned with the economic status of persons employed in chemistry and chemical engineering, all returns from members of the armed forces and those employed in other types of work were excluded from the analysis. The survey, therefore, includes only persons employed in chemistry or chemical engineering; 87 percent held at least a bachelor's degree in the field, 6 percent had partial college education in chemistry or chemical engineering, 3 percent had at least a bachelor's degree in some other field of science or engineering, and only 4 percent reported either college-level education in other fields or no college education.

Sex, Age Distribution, and Years of Experience

It is evident that those employed in chemistry and chemical engineering were predominantly male. Women in 1943 formed only slightly more than 4 percent of the total in the field of employment of chemistry and about 0.2 percent in chemical engineering. Slightly less than 3 percent of the total number of persons employed as chemists and 0.4 percent of those employed as chemical engineers were women, according to the 1940 census.

The median age of those employed in chemistry in 1943 was 33.5 years; that of women so employed was 29.4 years. The median age

of those employed in chemical engineering was 32.6. The 1940 census shows a median age of 33.6 years for male employed chemists but does not give age data for chemical engineers. A question on year of birth was included on the questionnaire sent out to nonmembers but was not included on that sent to members of the American Chemical Society. The age data for this combined survey were determined by establishing the relationship of year of entering the profession to the age of respondents. It was found, by comparing year of birth and year of entering the profession as given on the nonmember survey, that the median year of entry into the profession was 23 years of age. This fact was also established in an earlier survey of members made by the American Chemical Society in 1942.[2] It is therefore reasonable to conclude that a median age can be estimated by adding 23 to the number of years in the profession reported by each individual.

In 1943, the median years of experience were 10.5 for chemists and 9.6 for chemical engineers.

Major Field of Education and Educational Level

A high percentage of persons engaged in chemistry hold degrees above the bachelor's level (table 1). Nearly a fourth have a master's degree, while almost 19 percent have obtained the degree of doctor. About 8 percent of those employed in chemistry are without a degree, but almost all have done some college work. Fewer chemical engineers than chemists have advanced formal education beyond the bachelor's degree. Almost two-thirds have the bachelor's degree, about 22 percent have acquired the master's degree, but only 7.6 percent hold the degree of doctor. Relatively few employed engineers are without a degree.

About 9 percent of those employed in the field of chemistry in 1943 had received their education in the chemical engineering field, but as many as 17.6 percent of those employed as chemical engineers had been trained as chemists. In absolute numbers, however, the shift was in the other direction: some 6,500 persons whose major field of education had been chemical engineering were employed as chemists, while only about 4,500 persons made the reverse shift. As many as 6.6 percent of the chemists, mostly with a master's degree, were educated in some field other than chemistry or chemical engineering. Among the chemical engineers, 5 percent reported some other field of education.

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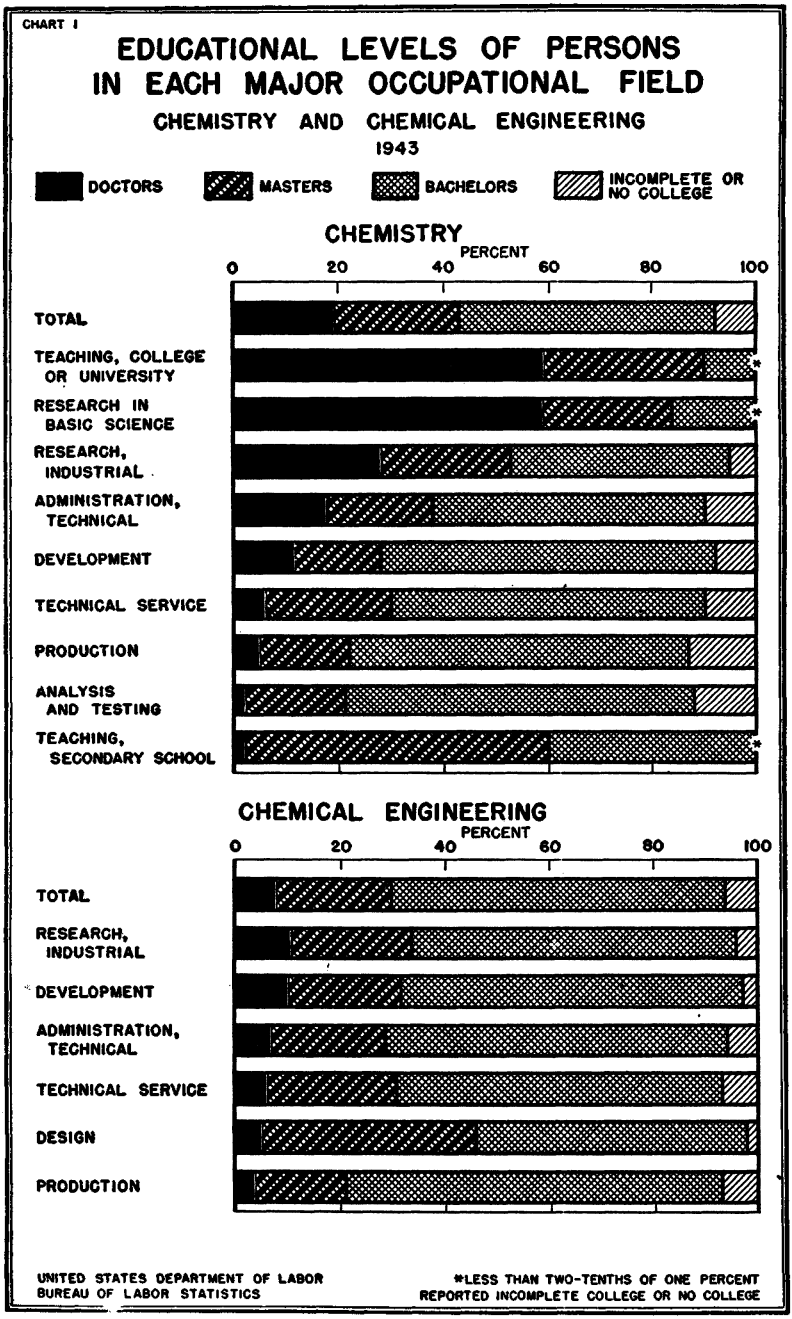
[2] The Economic Status of the Members of the American Chemical Society, 1942, by Andrew Fraser, Jr. (Available in Chemical and Engineering News, issues of October 25, November 25, December 10, and December 25, 1942, or in reprint form from the Mack Printing Co., Easton Pa.)

TABLE 1.—*Distribution of Persons Employed in Chemistry and Chemical Engineering, by Major Field of Education and Educational Level, 1943*

Educational level	Number employed	Major field of education		
		Chemistry	Chemical engineering	All other
CHEMISTRY				
Number[1] of persons employed: Total	71,000	59,700	6,600	4,700
Doctors	13,300	12,400	300	600
Masters	17,300	14,400	900	2,000
Bachelors	34,700	28,000	4,900	1,800
Incomplete college	5,200	4,400	500	300
No college	500	500	----	(2)
	Percent, by educational level[3]			
Persons employed: Total	100.0	100.0	100.0	100.0
Doctors	18.7	20.8	3.6	12.8
Masters	24.4	24.1	14.0	43.8
Bachelors	48.9	46.9	74.6	37.8
Incomplete college	7.3	7.3	7.8	5.6
No college	.7	.9	----	(4)
	Percent, by major field of education[3]			
Persons employed: Total	100.0	84.2	9.2	6.6
Doctors	100.0	93.7	1.8	4.5
Masters	100.0	82.8	5.3	11.9
Bachelors	100.0	80.8	14.1	5.1
Incomplete college	100.0	85.0	9.9	5.1
No college	100.0	99.8	----	.2
CHEMICAL ENGINEERING				
Number[1] of persons employed: Total	26,000	4,600	20,100	1,300
Doctors	2,000	600	1,300	100
Masters	5,800	900	4,600	300
Bachelors	16,800	2,800	13,200	800
Incomplete college	1,300	300	900	100
No college	100	(2)	100	(2)
	Percent, by educational level[3]			
Persons employed: Total	100.0	100.0	100.0	100.0
Doctors	7.6	13.9	6.3	5.7
Masters	22.3	19.2	23.1	20.2
Bachelors	64.5	59.5	65.7	64.6
Incomplete college	5.1	7.1	4.4	9.4
No college	.5	.3	.5	.1
	Percent, by major field of education[3]			
Persons employed: Total	100.0	17.6	77.4	5.0
Doctors	100.0	32.2	64.1	3.7
Masters	100.0	15.1	80.4	4.5
Bachelors	100.0	16.2	78.8	5.0
Incomplete college	100.0	24.5	66.4	9.1
No college	100.0	9.7	89.5	.8

[1] Estimated numbers of persons in this part of the table are shown rounded to the nearest 100.
[2] Less than 50.
[3] Percentages computed before rounding.
[4] Less than a tenth of 1 percent.



Geographical Distribution

Employment opportunities for those in the field of chemistry are concentrated in the Middle Atlantic States, with New York State employing the greatest numbers. The three States comprising the Middle Atlantic region (New York, New Jersey, and Pennsylvania) and the five comprising the East North Central region (Illinois, Ohio, Michigan, Indiana, and Wisconsin) employed over half the chemists and chemical engineers in the United States in 1943. California and Massachusetts each employed more than 4 percent of those in the field. The South Atlantic States employed about the same proportion of chemical engineers as chemists. Chemists had a higher proportion of jobs in the West North Central region; engineers were proportionately more numerous in the West South Central region, where the petroleum industries are important.

TABLE 2.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering, by Region and State, 1943*

Region and State	Percent employed in—	
	Chemistry	Chemical engineering
Middle Atlantic	32.5	29.4
New York	13.5	10.8
Pennsylvania	9.7	8.1
New Jersey	9.3	10.5
East North Central	23.4	23.2
Illinois	8.0	6.9
Ohio	6.2	8.2
Michigan	4.4	3.1
Other States	4.8	5.0
South Atlantic	10.0	10.3
New England	7.9	7.2
Massachusetts	4.3	4.0
Other States	3.6	3.2
Pacific	7.2	6.8
California	5.3	5.6
Other States	1.9	1.2
West North Central	6.0	4.6
West South Central	5.2	9.5
East South Central	3.2	4.8
Mountain	1.9	1.4
District of Columbia	1.7	1.3
Territories and possessions	.9	1.0
Not reported	.1	.5
Total	100.0	100.0

Source of Employment

Over 60 percent of those working in chemistry and as many as 82 percent of those in chemical engineering found employment in the manufacturing industries in 1943, with by far the greatest numbers in the chemical industries (table 3). The second largest employer was the petroleum industry, where the proportion of engineers is considerably higher than that of chemists. State, county, and municipal governments employed nearly 12 percent of the chemists, while the Federal Government and educational institutions each employed about 7 percent. The Federal Government employed 4.7 percent of the chemical engineers, but other public authorities afforded little employment opportunity for this group.

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TABLE 3.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering, by Source of Employment, 1943*

Source of employment	Percent of persons employed in—	
	Chemistry	Chemical engineering
Public authorities	20.7	6.7
Federal Government	7.6	4.7
State, county, and municipal governments	11.5	1.7
Other public authorities	1.6	.3
Nonpublic organizations	78.1	91.7
Educational institutions	6.8	1.6
Private firms or companies	66.4	86.4
Manufacturing	63.1	82.2
Food	4.9	3.3
Textiles	2.1	1.4
Paper and allied products	2.3	4.1
Chemical	28.1	35.6
Paints, varnishes, and colors	5.9	3.9
Miscellaneous chemical industries	22.2	31.7
Petroleum and coal products	7.7	17.1
Rubber products	4.0	4.9
Iron and steel and their products	3.1	2.1
Nonferrous metals and their products	3.1	4.1
Other manufacturing industries	7.8	9.6
Other private organizations [1]	3.3	4.2
Other nonpublic organizations [2]	4.9	3.7
Retired, unemployed, or direct relief	(3)	.1
Not reported	1.2	1.5
Total	100.0	100.0

[1] Includes mining, construction, public utilities, etc.
[2] Includes research institutes, consulting laboratory firms, technical or trade associations, etc.
[3] Less than a tenth of 1 percent.

Occupational Status

In 1943, over 60 percent of the chemists surveyed were engaged in analysis and testing, industrial research, and technical administration. Almost half the engineers were engaged in technical administration or production. The distribution according to occupational status is shown in the accompanying tabulation.

Occupational status, 1943:	*Percent engaged in—*	
	Chemistry	*Chemical engineering*
Research, industrial	22.6	11.9
Administration, technical	14.9	27.2
Teaching, college or university	6.5	(1)
Analysis and testing	23.8	(1)
Research in basic science	4.8	(1)
Development	5.9	15.1
Production	7.7	21.7
Technical service	2.1	6.2
Teaching, secondary schools	5.7	(1)
Design	(1)	5.1
All other	6.0	12.8
Total	100.0	100.0

[1] Number reporting is too small to be significant and is included in "all other."

Persons interested in chemistry as a career may be concerned with the extent of formal education which may be necessary to facilitate entrance and success in the various fields of work. In some fields advanced degrees are essential; in others, they are held by a relatively

small proportion. (See chart 1 and table 4.) For example, in research in basic science, nearly 60 percent of those employed in chemistry held a doctor's degree; 25 percent held a master's degree. The doctorate was also held by nearly 60 percent of those in college or university teaching, and an additional 30 percent held a master's degree. On the other hand, in secondary school teaching only 1 or 2 percent were doctors, but nearly 60 percent held a master's degree. In analysis and testing only 2 percent, and in production only 5 percent, held a doctor's degree.

Among chemical engineers, a high proportion of advanced degrees was found in design work. Analysis and testing and production jobs were filled largely by those with a bachelor's degree. Since bachelors account for nearly two-thirds of all the chemical engineers, it is not surprising to find them predominating in most fields of work.

TABLE 4.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering by Selected Occupational Status According to Educational Level, 1943*

Occupational status	Doctor's degree	Master's degree	Bachelor's degree	Incomplete or no college	Total
	Percent employed in chemistry				
Total	18.7	24.7	48.8	7.8	100.0
Research, industrial	27.8	25.3	41.4	5.5	100.0
Administration, technical	17.8	19.7	52.2	10.3	100.0
Teaching, college or university	58.7	31.5	9.7	.1	100.0
Analysis and testing	2.1	19.2	66.3	12.4	100.0
Research in basic science	59.1	25.0	15.8	.1	100.0
Development	11.4	16.2	64.1	8.3	100.0
Production	5.3	17.0	64.4	13.3	100.0
Technical service	6.2	23.8	59.9	10.1	100.0
Teaching, secondary school	1.5	58.3	40.2	(1)	100.0
	Percent employed in chemical engineering				
Total	7.5	22.5	64.4	5.6	100.0
Research, industrial	11.1	23.2	61.2	4.5	100.0
Administration, technical	7.0	22.2	64.7	6.1	100.0
Development	10.3	21.4	65.0	3.3	100.0
Production	3.5	17.4	71.6	7.5	100.0
Technical service	5.6	25.8	61.6	7.0	100.0
Design	5.1	40.8	52.1	2.0	100.0

[1] Less than a tenth of 1 percent.

Field of Specialization

The greatest number of persons employed in chemistry reported physical, analytical, and inorganic chemistry as their fields of specialization, with general industrial chemistry, general chemistry (basic science), and petroleum ranking next in importance. (See table 5.) Each of the following fields also showed more than 5 percent of the total number of chemists: pharmaceuticals, biologicals, and vitamins; foods and kindred products; organic chemistry (basic science); paints, varnishes, and lacquers; and organic chemical technology. About 40 percent of those employed in engineering were specialized in the general chemical engineering field or in petroleum and its products.

TABLE 5.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering, by Field of Specialization, 1943*

Field of specialization	Percent employed in—	
	Chemistry	Chemical engineering
Agricultural chemistry	1.6	.1
Biological and physiological chemistry [1]	3.4	.1
Chemical engineering, general	.9	24.4
General chemistry [1]	7.8	.1
Industrial chemistry, general	8.5	2.9
Inorganic chemical technology [2]	2.1	5.9
Medical chemistry [3]	.7	(4)
Organic chemical technology	5.0	3.7
Organic chemistry [1]	5.1	.3
Physical, analytical, and inorganic chemistry [1]	10.0	.5
Public health [5]	1.7	1.3
Ceramic industries [6]	1.1	1.8
Equipment for process industries	.1	2.0
Explosives	3.3	6.5
Fertilizers and insecticides	.7	.9
Foods and kindred products	5.6	2.8
Gas and fuels [7]	1.1	2.2
Laboratory apparatus and equipment	.5	.2
Leather and its manufactures	.6	.1
Machinery and implements [8]	.2	.7
Metallurgical technology, ferrous	1.4	.8
Metallurgical technology, nonferrous	1.8	2.8
Motor vehicles	(4)	(4)
Paints, varnishes, and lacquers	5.1	3.1
Paper and forest products [9]	2.5	4.2
Petroleum and its products	7.3	15.3
Pharmaceuticals, biologicals, and vitamins	5.7	1.3
Rubber and its products	3.8	4.6
Synthetic fiber technology	.7	1.3
Synthetic resins and plastics	4.4	4.0
Textiles and their products [10]	3.0	1.4
Transportation equipment [11]	.3	.3
Other field of science or engineering	2.8	3.5
Other nonprofessional	.2	.3
Not reported	1.0	.6
Total	100.0	100.0

[1] Basic science.
[2] Includes heavy chemicals.
[3] Includes clinical.
[4] Less than a tenth of 1 percent.
[5] Includes water, sewage, and sanitation.
[6] Includes glass and cement technology.
[7] Includes natural and manufactured gas, and power generation.
[8] Includes mechanical and electrical equipment.
[9] Includes naval stores.
[10] Excludes synthetic fiber technology.
[11] Other than motor vehicles.

Earnings

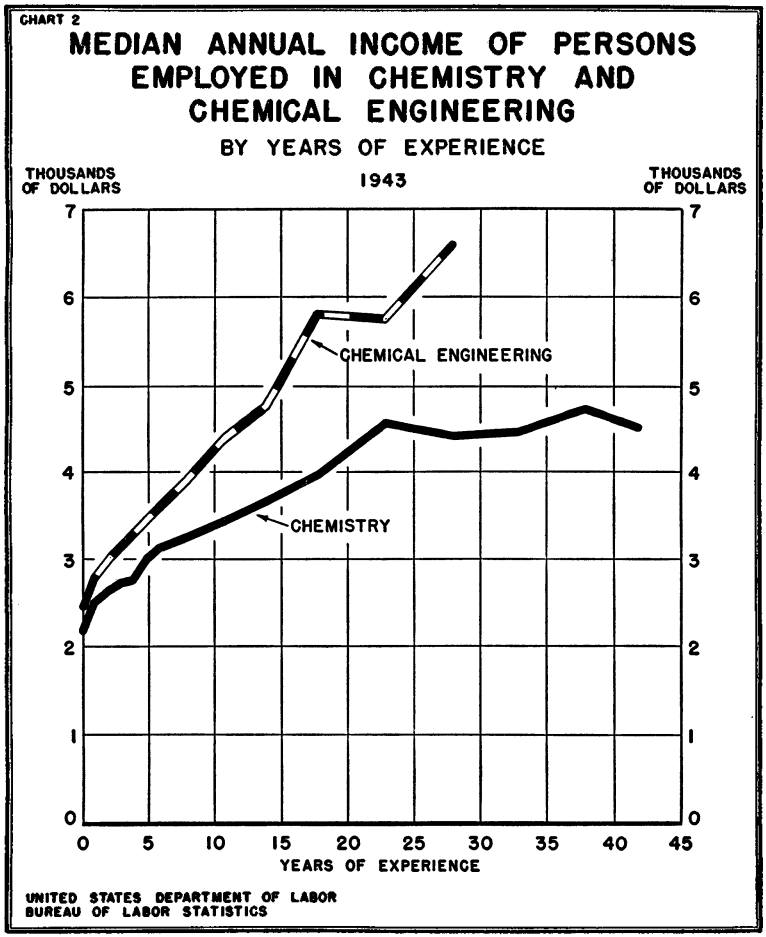
MEDIAN ANNUAL INCOME

Respondents in the survey were asked to report their annual income including salaries, fees, and bonuses, regardless of whether or not earned in their profession. The median for all employed in chemistry, without regard to any attribute, was $3,280 in 1943; for those employed in chemical engineering, it was $3,998. The median income ranged from $2,152 for beginners in chemistry to $4,751 for those with 36 to 40 years of experience. Those in chemical engineering began at an average of $2,452, and the average steadily increased to $6,620 at levels of 26 to 30 years' experience. Median annual incomes, by years of experience, are shown in chart 2 and in table 6.

TABLE 6.—*Median Annual Income of Persons Employed in Chemistry and Chemical Engineering, by Years of Experience, 1943*

Years of experience	Median annual income		Years of experience	Median annual income	
	Chemistry	Chemical engineering		Chemistry	Chemical engineering
Total	$3,280	$3,998			
			10–12 years	$3,454	$4,414
Under 1 year	2,152	2,452	13–15 years	3,694	4,799
1 year	2,514	2,802	16–20 years	3,980	5,838
2 years	2,659	3,017	21–25 years	4,597	5,788
3 years	2,754	3,156	26–30 years	4,439	6,620
4 years	2,786	3,291	31–35 years	4,497	(1)
5 years	3,003	3,472	36–40 years	4,751	(1)
6 years	3,116	3,616	41–43 years	4,527	(1)
7–9 years	3,262	3,913	44 years and over	(1)	(1)

[1] Total number too small to compute median.



In interpreting the data on income, it should be noted that those persons employed in the field of chemistry are relatively young (median ages being 33.5 years for chemists employed in 1943 and 32.6 years for chemical engineers), and that the median income, therefore, reflects the preponderance of younger men. Actually, income increased with experience, according to the survey, the older and more experienced chemists and chemical engineers having earned, on the average, well over the indicated median for the groups as a whole.

BASE MONTHLY SALARY RATE

The base monthly salary rate was reported in two ways—(1) *exclusive* of overtime payments, fees, and bonuses; (2) exclusive of fees and bonuses, but *inclusive* of overtime. It was found that after about 13 to 20 years of experience total annual income tended to exceed by substantial amounts a figure 12 times the base monthly salary rate *inclusive* of overtime. This would indicate that, on the average, those persons at the higher-experience levels began to receive appreciable additional income from fees, bonuses, and sources other than base salary.

Median monthly salary rates, with and without overtime, for persons employed in chemistry and chemical engineering in 1943, are shown in table 7, by length of experience.

TABLE 7.—*Median Base Monthly Salary Rates of Persons Employed in Chemistry and Chemical Engineering, by Years of Experience, 1943*

Years of experience	Median base monthly salary rate in—			
	Chemistry		Chemical engineering	
	Excluding overtime	Including overtime	Excluding overtime	Including overtime
All persons employed	$243	$268	$297	$324
Under 1 year	170	201	176	213
1 year	177	206	204	237
2 years	194	222	225	256
3 years	204	230	240	261
4 years	210	229	246	273
5 years	216	248	259	294
6 years	235	256	268	302
7–9 years	241	262	297	322
10–12 years	257	286	333	370
13–15 years	274	298	358	387
16–20 years	300	329	411	437
21–25 years	340	359	434	451
26–30 years	336	357	510	512
31–35 years	341	357	(1)	(1)
36–40 years	357	371	(1)	(1)
41–43 years	360	414	(1)	(1)
44 years and over	(1)	(1)	(1)	(1)

[1] Number reporting is too small to compute median.

Earnings of those in chemistry seem to have had an almost steady increase until a median of $360 a month was reached after 40 years' experience. Those in chemical engineering, with 26 to 30 years' experience, advanced rapidly to as high as $510. In 1943, chemists, on the average, earned $25 each month in overtime payments; chemical engineers earned as much as $27. Apparently the beginners benefited most from overtime, as chemists with less than 1 year of experience

had a median income of $201 a month including overtime, or $31 more than the straight-time median. A similar group of chemical engineers earned, with overtime, $37 more than the straight-time median.

Earnings by Occupational Field

Highest salaries were earned in administrative jobs. Teachers in colleges and universities received slightly above the median salary of all employed in chemistry; chemistry teachers employed in secondary schools received considerably less remuneration. Analysis and testing, in which field more than a fifth of those employed in chemistry were engaged at the time of the survey, showed a comparatively low rate of pay. The median base monthly salaries for those in chemistry and those in chemical engineering engaged in the principal fields of work are shown in the accompanying tabulation.

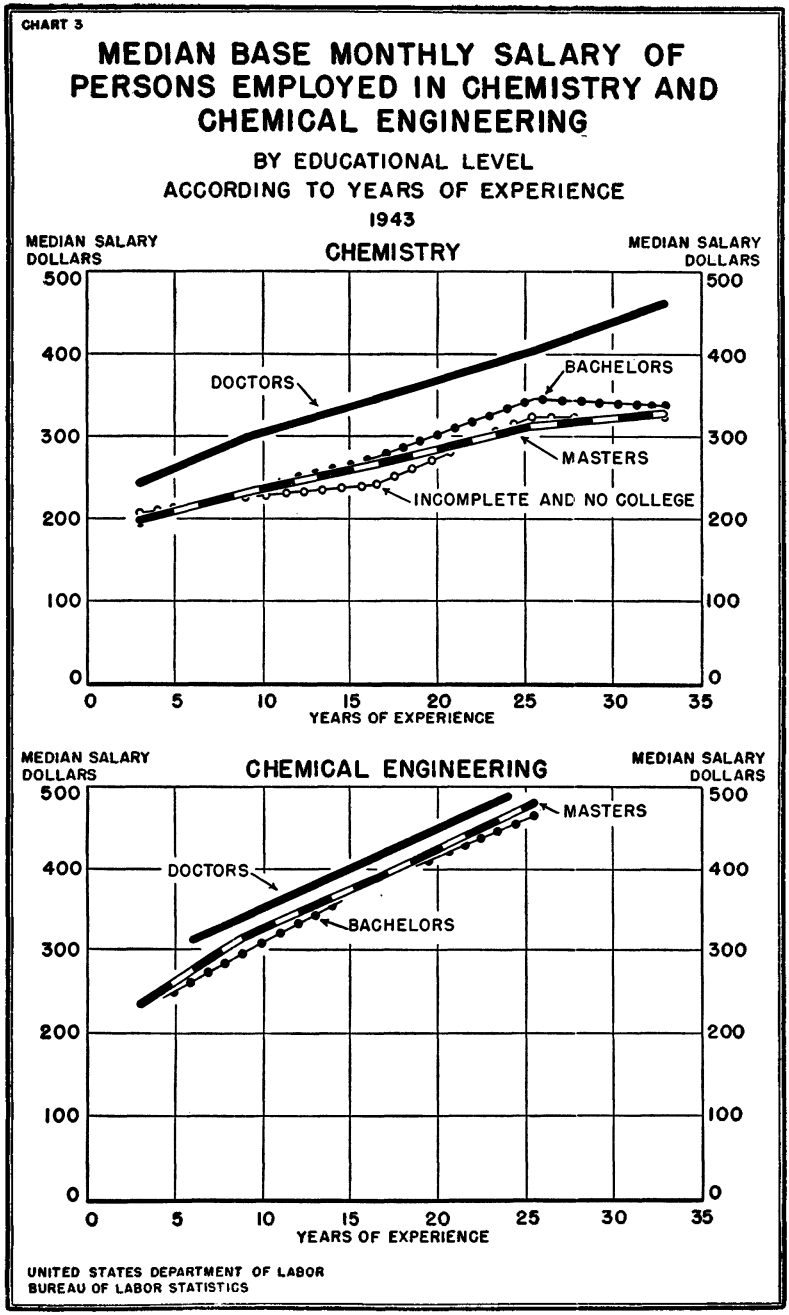
	Median base monthly salary, 1943	
	Chemistry	*Chemical engineering*
All principal fields	$243	$297
Research, industrial	259	256
Administration, technical	335	370
Teaching, college or university	249	(1)
Teaching, secondary	218	(1)
Analysis and testing	210	(1)
Research in basic science	243	(1)
Development	229	262
Production	255	278
Technical service	281	268
Design	(1)	301

[1] Number too small to compute median.

Among the reasons for differences in earnings between those employed in chemistry and those in chemical engineering was the concentration of persons in some fields of higher remuneration in chemical engineering. For example, more than a quarter of those in engineering were engaged in technical administration, as compared to about a seventh of the persons who classified themselves in the field of chemistry. The latter group, on the other hand, had higher proportions in such fields as analysis and testing and secondary school teaching, in which salaries seemed to be lower than the general average. Within a particular field of work, in some cases those employed in chemistry earned more, on the average, than those in chemical engineering; in other cases the reverse was true.

Earnings by Educational Level

The income of those employed in chemistry and chemical engineering seems to vary with the extent of their education. Differentials in earnings between holders of the bachelor's degree and holders of the master's degree were neither large nor consistent, but the median base monthly salaries of those holding the doctor's degree significantly exceeded those of the other groups. Chemists with a doctor's degree and with 6 to 12 years' experience reported average monthly base salaries about $65 higher than those of chemists at the same experience levels who held lower degrees. The differentials ranged between $72 and $104 for chemists with 13 to 20 years of experience, and averaged



well over $125 a month for chemists with more than 30 years in the field. A similar pattern of generally widening differences in salaries between doctors and the other two groups is found among the chemical engineers.

Persons who reported not having completed college or not having gone to college attained lower median base monthly salaries, among the chemical engineers, than each of the other groups at each experience level, but, among those employed in chemistry, their salaries were not consistently or significantly different from those of chemists with the bachelor's or the master's degree. Many persons in this group attained success because of special abilities or because of valuable practical experience. Of the total employed in both chemistry and chemical engineering, less than 1 percent was without college training (table 1); so that the combination of those having incomplete college training, and those without college experience entirely, actually represents a group composed chiefly of persons who may have had a great deal of formal college education but who lacked the precise requirements for a degree.

In general, salaries of chemists and chemical engineers seem to rise steadily for at least the first 20 or 30 years of professional work. It should be emphasized, however, that the data do not permit of definite statements as to the progression of salaries of individuals. What is shown is a cross section *at one time*, of the salaries of persons employed in the field with varying amounts of experience. The curves shown in the charts reflect many factors in the history of the profession over the past 30 or more years, as well as the mere factor of the increasing years of experience of the individuals.

Information on median base monthly salary in chemistry and chemical engineering, analyzed by educational level according to years of experience, as of 1943, is given in table 8 and chart 3.

TABLE 8.—*Median Base Monthly Salary of Persons Employed in Chemistry and Chemical Engineering, by Educational Level and Years of Experience, 1943*

Years of experience	Median base monthly salary of persons employed, with—							
	Doctor's degree	Master's degree	Bachelor's degree	Incomplete and no college	Doctor's degree	Master's degree	Bachelor's degree	Incomplete and no college
	Chemistry				Chemical engineering			
All persons	$312	$232	$226	$252	$406	$312	$282	$285
Less than 6 years	244	199	196	206	312	235	230	(1)
6-12 years	297	232	232	226		316	299	254
13-20 years	345	267	273	241		389	383	329
21-30 years	405	313	346	323	489	481	466	(1)
31 years and over	461	329	337	327		(1)	(1)	(1)

[1] Number too small to compute median.

Women in Chemistry

In 1943 women constituted slightly more than 4 percent of all persons employed in chemistry and considerably less than 1 percent of all employed in chemical engineering. It is impossible with so small a sample to give any reliable data for women engineers, and the number of chemists is also too small to make detailed analyses with any degree of accuracy. The material presented in this section is considered to be less reliable than for the entire group, but, in general, indicates the status of women in relation to all chemists.

The distribution of women employed in chemistry by years of experience shows a concentration in the lower experience levels. Over half the women had less than 7 years of experience. The median age was 29.4 years, as compared to a median age of 33.5 years for all chemists. Over 30 percent had been in the field less than 2 years at the time of the survey, and represent an age group of 25 years or less.

By comparing the occupational status of women (as shown in the following tabulation) with that of all chemists (p. 8), it is evident that analysis and testing is relatively a much more important field for women than for men, inasmuch as about 31 percent of all women were in that status as compared with only 23.8 percent of all chemists. Teaching in colleges and research in basic science have higher proportions of women, while the reverse is true in such fields as technical administration and industrial research. The distribution of women employed in chemistry in 1943 is shown by occupational status.

Occupational status:	*Percent*
Research, industrial	14.3
Administration, technical	5.1
Teaching, college or university	14.1
Analysis and testing	31.1
Research in basic science	13.0
Development	3.9
Technical service	3.7
Teaching, secondary school	4.0
All other	10.8
Total	100.0

In examining the earnings of women employed in chemistry, such factors as experience and type of job in influencing income become especially important. The largest number of women were engaged in analysis and testing—the field in which many beginners find employment, and therefore one in which the salaries are comparatively low. The concentration in the low-experience levels greatly affected the income median for the group. It is not surprising, therefore, to find the income of women considerably below that of the entire group of chemists, of which nearly 96 percent are men. While income may be influenced also by employment and personnel policies, such factors are beyond the scope of this survey.

Salaries of women were, on the average, below those of men who had the same number of years of experience. The median base monthly salaries of women employed in chemistry, by years of experience, are shown for 1943:

	Median base monthly salary, 1943
All women employed	$170
Less than 6 years' experience	159
6–15 years' experience	195
16 years' experience and over	225

Comparison of Prewar and Wartime Data

Since information was requested for the year 1941 as well as for 1943, it is possible to make some comparisons of the prewar and wartime statuses of those employed in the field of chemistry.

Changes in employment, occupational status, and earnings are evaluated in this study, on the basis of reports by those in the occupations early in 1944 as to their experience in 1941 and in 1943. Like

all retrospective surveys of individuals, therefore, it is subject to some bias resulting from the inclusion of persons who entered the field between 1941 and 1943, and the exclusion of those who left the field during that period because of death or other reasons. To some extent, the bias is corrected by tabulating data only on those individuals reporting for both years; but even such data reflect not only the changes in the profession as a whole but also the progress of the careers of individuals—their advancement in occupational status and in income normally tending to occur with age and experience. Furthermore, the data for the earlier year do not reflect the higher incomes and advanced occupational status of the older men who died or retired during the period. Fortunately the period was so short that the data are not affected very much by deaths, and it is likely that, as in the labor force as a whole, retirement rates among chemists and chemical engineers were lower in this period because of the great wartime needs for experienced workers.

SHIFTS IN SOURCE OF EMPLOYMENT

Using only the data from those respondents who reported source of employment both in 1941 and in 1943 (86 percent of those in chemistry, 88 percent of those in chemical engineering), it was found that employment shifts among those chemists already working in the field in 1941 were mainly into manufacturing, especially into the miscellaneous chemical industries. Chemists left employment in State and local governments, educational institutions, and textile manufacturing. Chemical engineers did less shifting, because their normal employment is principally in the manufacturing industries. Some engineers left State and local government jobs, educational institutions, and paint, varnish, and color manufacturing. (See table 9.)

TABLE 9.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering Responding for Both Years, by Source of Employment, 1941 and 1943*

Source of employment	Percent employed in—			
	Chemistry		Chemical engineering	
	1941	1943	1941	1943
Public authorities	22.5	20.8	6.6	7.4
Federal Government	5.5	7.4	3.2	4.9
State, county, and municipal governments	14.7	11.2	2.9	1.5
Other public authorities	2.3	2.2	.5	1.0
Nonpublic organizations	77.4	79.2	93.4	92.5
Educational institutions	9.3	6.9	2.4	1.5
Private firms or companies	63.1	67.4	86.7	87.2
Manufacturing	58.6	64.0	82.0	82.9
Food	5.2	5.2	3.6	3.2
Textiles	4.5	2.1	1.6	1.6
Paper and allied products	.5	2.3	4.9	4.4
Chemical	26.0	28.8	36.3	36.5
Paints, varnishes, and colors	6.6	6.2	5.4	4.2
Miscellaneous chemical industries	19.4	22.6	30.9	32.3
Petroleum and coal products	7.5	7.7	17.2	17.1
Rubber products	3.2	3.8	4.1	4.5
Other manufacturing industries	11.7	14.1	14.3	15.6
Other private organizations [1]	4.5	3.4	4.7	4.3
Other nonpublic organizations [2]	5.0	4.9	4.3	3.8
Retired, unemployed, or direct relief	.1			.1
Total	100.0	100.0	100.0	100.0

[1] Includes mining, construction, public utilities, etc.
[2] Includes research institutes, consulting laboratory firms, technical or trade associations, etc.

SHIFTS IN OCCUPATIONAL STATUS

The shifts in occupational status, or type of work, were more pronounced than the shifts in source of employment. The shifts in occupational status are shown in table 10. For chemists, the greatest increases were in the fields of industrial research and technical administration, the shift being away from analysis and testing, and teaching. For chemical engineers, the chief shift (9.7 percentage points) was into the technical administration field. Employment in production increased by 3.7 percentage points. Among the engineers, the greatest reduction (9.5 percentage points) was in analysis and testing; the proportion engaged in industrial research dropped by 3.1 percentage points. While these changes, as shown by the data, represent largely the real changes in status which took place in the field of chemistry in this period, to a small extent they also reflect the bias mentioned above.

The distribution of the "total group" of chemists and engineers in 1943 is presented in table 10 in order to show whether the shifts in occupational status of individuals responding for both years is representative of real shifts in the profession. The total group includes those entering the field in 1942 and 1943, but, of course, excludes those who left in that period. Very slight differences appear when the two groups are compared for 1943. The shifts all reflect the emphasis on war production. The greater proportion of chemists engaged in analysis and testing in the total group in 1943, as compared with the identical group in the same year, indicates that this field absorbs many beginners. Beginners in chemical engineering apparently secure jobs more readily in analysis and testing and production; a smaller proportion of beginners than of the older group were employed in technical administration.

TABLE 10.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering Reporting Occupational Status for 1941 and 1943*

Occupational status	Chemistry			Chemical engineering		
	Identical group [1]		Total group [2]	Identical group [1]		Total group [2]
	1941	1943	1943	1941	1943	1943
Research, industrial	17.6	23.1	22.6	14.6	11.5	11.9
Administration, technical	10.7	16.2	14.9	18.7	28.4	27.2
Teaching, college or university	8.0	6.6	6.5	[3]	[3]	[3]
Analysis and testing	25.2	21.7	23.8	11.4	1.9	2.5
Research in basic science	4.2	4.9	4.8	[3]	[3]	[3]
Development	4.5	6.0	5.9	14.1	14.9	15.1
Production	7.1	7.7	7.7	17.6	21.3	21.7
Technical service	2.1	2.1	2.1	4.8	5.9	6.2
Teaching, secondary school	7.5	5.6	5.7	[3]		[3]
Design			[3]	4.7	5.2	5.1
All other	13.1	6.1	6.0	14.1	10.9	10.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1] Includes only those who reported occupational status for both years.
[2] Includes all who reported occupational status for 1943.
[3] Number reporting is too small to be significant and is included in "all other."

CHANGES IN BASE MONTHLY SALARIES

In making comparisons of earnings in 1941 and 1943 for the same group of workers (table 11), it should be borne in mind that the respond-

ents had 2 years more experience when reporting 1943 salaries. In 1941, 7.5 percent of those employed in chemistry earned less than $100 per month, but in 1943 there were only 2.2 percent earning less than this amount. As many as 31.7 percent earned less than $160 per month in 1941; 2 years later there were only 8.0 percent. It is not known to what extent those reporting the low salaries may have been engaged in routine work in such jobs as analysis and testing or production. At the other end of the scale, 14 percent made $400 or more per month in 1943, compared to 8.7 percent in 1941.

Among those employed in chemical engineering, as many as 18.2 percent earned less than $160 per month in 1941, but only 1.6 percent in 1943. In 1941, 17.2 percent earned more than $400; 2 years later 26.8 percent fell in that salary bracket.

The extent to which the increases in earnings shown in table 11 reflect the professional advancement of individuals rather than a general advance in income levels in the field is partially suggested by data in table 12, which includes *all* persons employed in chemistry and chemical engineering who reported income in either year. The median base monthly salaries for 1941 are nearly identical in the two tables, both in the case of chemists and in that of chemical engineers. In 1943, however, the tabulation for *all* those reporting (table 12), shows lower median incomes than the tabulation (table 11) which covers only those reporting in both years (chemists, $243 as compared with $252; chemical engineers, $297 as compared with $308); i. e., those who entered the field between 1941 and 1943 had lower-than-average salaries, as would be expected. Since the survey omits the income in 1941 of persons who left the field since, including largely those who died or retired and whose incomes in 1941 were very likely higher than the average, the 1941 average shown by the survey may be slightly lower than the true average in that year, and the increase in income levels indicated by table 12 may be somewhat greater than actually took place.

TABLE 11.—*Percentage Distribution of Persons Employed in Chemistry and Chemical Engineering Reporting Base Monthly Salary, 1941 and 1943*

Base monthly salary rate	Percentage distribution				Base monthly salary rate	Percentage distribution			
	Chemistry		Chemical engineering			Chemistry		Chemical engineering	
	1941	1943	1941	1943		1941	1943	1941	1943
Under $100	7.5	2.2	2.1	0.5	$300–$339	7.2	10.8	9.1	13.5
$100–$119	5.4	.9	1.7	.2	$340–$399	5.2	8.5	6.6	12.3
$120–$139	8.6	1.5	4.9	.3	$400–$479	3.5	6.5	6.6	11.4
$140–$159	10.2	3.4	9.5	.6	$480–$569	2.1	3.1	4.0	6.6
$160–$179	9.7	6.8	9.3	1.7	$570–$679	1.0	1.6	2.4	3.5
$180–$199	8.5	8.3	8.1	3.8	$680–$849	.8	1.1	1.9	2.1
$200–$219	10.6	11.9	9.3	6.3	$850 and over	1.3	1.7	2.3	3.2
$220–$239	5.6	9.4	6.6	8.4					
$240–$259	5.8	9.1	6.9	10.1	Total	100.0	100.0	100.0	100.0
$260–$299	7.0	13.2	8.7	15.5					

Nevertheless, it is significant that an increase of nearly 22 percent occurred in the median base monthly salaries of those employed in chemistry, and that the salaries of those employed in chemical engineering advanced slightly more than 26 percent in the 2-year period,

reflecting the great needs of war industry for the services of these workers. It is also of interest that the salaries of the lowest-paid groups in both fields of employment increased by the greatest amounts proportionately (table 12).

TABLE 12.—*Comparison of Five Levels of Base Monthly Salaries in 1941 and 1943 for All Persons Employed in Chemistry and Chemical Engineering*

Percent earning more than specified salary	Base monthly salary		Increase from 1941 to 1943		Base monthly salary		Increase from 1941 to 1943	
	1941	1943	Amount	Percent	1941	1943	Amount	Percent
	Chemistry				Chemical engineering			
90 percent	$107	$160	$53	49.5	$144	$199	$55	38.2
75 percent	148	194	46	31.1	174	236	62	35.6
50 percent	200	243	43	21.5	235	297	62	26.4
25 percent	276	318	42	15.2	333	400	67	20.1
10 percent	383	426	43	11.2	490	540	50	10.2

Bureau Budget No. 44-4402.1
Approval expires September 30, 1944

SURVEY OF THE CHEMICAL PROFESSION

CONDUCTED BY THE

BUREAU OF LABOR STATISTICS of the U. S. DEPARTMENT OF LABOR

IN COOPERATION WITH THE

NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL OF THE WAR MANPOWER COMMISSION

Before answering any questions, please read accompanying letter. In each question please note that only ONE code letter or number is to be recorded for any one year; otherwise the questionnaire cannot be used for tabulation purposes.

1. WAR-TIME STATUS AND POST-WAR EMPLOYMENT EXPECTATION: CIRCLE ONE CODE NUMBER.

(1) Does your present employment, whether as a member of the armed forces or as a civilian, require training or experience in chemistry, chemical engineering, or a closely related field? YES 1 NO 2

(2) Are you now

A member of the armed forces. 1

A male civilian of draft age (18-37 years inclusive):

Classified 4-F. 2

Occupationally deferred 3

Other draft classification. 4

A male civilian not of draft age. 5

A female civilian 6

(3) If you are a member of the armed forces circle one of each of the month and year codes that corresponds to the period when you entered the service.

MONTH	CODE NUMBER		CODE NUMBER		CODE NUMBER	YEAR	CODE NUMBER
January. . .	1	May. . . .	5	September. . .	9	1940 or before. . .	0
February . .	2	June . . .	6	October. . . .	0	1941.	1
March. . . .	3	July . . .	7	November . . .	X	1942.	2
April. . . .	4	August . .	8	December . . .	Y	1943.	3
						1944.	4

(4) If you are now a civilian do you consider your present employment

PERMANENT 1 TEMPORARY (Including "duration only") 2

(5) If you are in the armed forces or marked "Temporary 2" in (4) above (OTHERWISE OMIT THIS ITEM), circle the code number beside the ONE ITEM that best describes your post-war employment prospects.

NOW ON LEAVE from permanent position. 1

OTHER DEFINITE PROSPECT of post-war employment:

In the professional field in which now employed 2

In some other profession or occupation. 3

NO DEFINITE PROSPECT of post-war employment, but intend to:

Seek employment in the professional field in which now employed 4

Get additional training in this professional field before seeking employment. 5

Seek employment in another profession or occupation 6

Get training in another profession or occupation before seeking employment. 7

Retire. 8

Do not know 9

(6) Whatever your present economic status and expectations, do you consider your post-war employment prospects to be:

	CODE NUMBER (Circle only one)
Better than your pre-war status?	1
Same as your pre-war status?	2
Worse than your pre-war status?.	3

(7) If you are a civilian (OTHERWISE OMIT THIS ITEM), circle the code beside the ONE ITEM that best describes your post-war intentions with respect to your place of residence.

Will stay in present locality (city, town, village, etc.). 1

Will move to different locality only if you lose your job. 2

Will move to different locality in any event 3

Do not know. 4

2. SEX: CIRCLE PROPER CODE NUMBER. MALE 1 FEMALE 2

3. YEAR OF BIRTH: ENTER PROPER YEAR. _____

4. EDUCATIONAL LEVEL: *CIRCLE BELOW IN ONE AND ONLY ONE OF THE FOLLOWING FOUR FIELDS THE ONE CODE NUMBER THAT CORRESPONDS TO THE HIGHEST EDUCATIONAL LEVEL REACHED BY YOU.*

EDUCATIONAL LEVEL
(Circle one and only one code number)

Field	Doctor	Master (or equiv.)	Bachelor	Incomplete college training	No college training
Chemistry.	11	12	13	14	15
Chemical engineering	21	22	23	24	25
Other field of science or engineering. . . .	31	32	33	34	35
Any other field.	41	42	43	44	45

5. YEAR OF ENTERING PROFESSION:

(1) IF YOU HAVE A BACHELOR'S DEGREE, CIRCLE THE YEAR in which it was awarded, or

(2) IF YOU DO NOT HAVE A BACHELOR'S DEGREE, CIRCLE THE YEAR in which you consider yourself to have entered the profession.

1899 or before									
19 00	01	02	03	04	05	06	07	08	09
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43						

6. STATE IN WHICH EMPLOYED: Under each of the following years, PLACE the CODE NUMBER corresponding to the STATE in which you were employed for the major part of that year. DO NOT ENTER any item for any year prior to the one in which you received your bachelor's degree, or, if a nongraduate, the year in which you consider yourself to have entered the profession.

State:

1943 STATE	CODE NUMBER	1943 STATE	CODE NUMBER	1942 STATE	CODE NUMBER	1941 STATE	CODE NUMBER
Alabama.	73	Iowa.	52	Nevada.	98	South Dakota.	55
Arizona.	96	Kansas.	57	New Hampshire	32	Tennessee	72
Arkansas	61	Kentucky.	71	New Jersey.	02	Texas	64
California	43	Louisiana	62	New Mexico.	95	Utah.	97
Colorado	94	Maine	31	New York.	01	Vermont	33
Connecticut.	36	Maryland.	22	North Carolina. . . .	25	Virginia.	23
Delaware	21	Massachusetts	34	North Dakota.	54	Washington.	41
District of Columbia .	89	Michigan.	14	Ohio.	11	West Virginia	24
Florida.	28	Minnesota	51	Oklahoma.	63	Wisconsin	15
Georgia.	27	Mississippi	74	Oregon.	42	Wyoming	93
Idaho.	92	Missouri.	53	Pennsylvania.	03	U. S. Territories and possessions . .	X6
Illinois	13	Montana	91	Rhode Island.	35	Foreign Countries . .	X7
Indiana.	12	Nebraska.	56	South Carolina. . . .	26		

7. INCOME AND RATE OF EARNINGS: Under each of the following years, PLACE the ONE CODE NUMBER of the INCOME BRACKET that contains (1) your ANNUAL INCOME INCLUDING salaries, fees, and bonuses, regardless of whether or not earned in your profession; and (2) your MONTHLY SALARY RATE for TIME ACTUALLY EMPLOYED in your major field: (a) exclusive of overtime payment, fees, and bonuses; and (b) exclusive of fees and bonuses, but inclusive of overtime. (Insert figure in (b) even if (a) and (b) are the same. Otherwise the results cannot be tabulated.) DO NOT ENTER any item for any year prior to the one in which you received your bachelor's degree, or, if a nongraduate, the year in which you consider yourself to have entered the profession.

(1) Annual Income:

1943		1942		1941	
INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER
Under $1,200	01	$2,600 and under 3,000...	09	$6,000 and under 6,600..	17	$12,000 and under 13,800..	25
$1,200 and under 1,400..	02	3,000 and under 3,400...	10	6,600 and under 7,200..	18	13,800 and under 15,600..	26
1,400 and under 1,600..	03	3,400 and under 3,800...	11	7,200 and under 7,800..	19	15,600 and under 17,400..	27
1,600 and under 1,800..	04	3,800 and under 4,200...	12	7,800 and under 8,400..	20	17,400 and under 19,200..	28
1,800 and under 2,000..	05	4,200 and under 4,600...	13	8,400 and under 9,000..	21	19,200 and over.....	29
2,000 and under 2,200..	06	4,600 and under 5,000...	14	9,000 and under 9,600..	22		
2,200 and under 2,400..	07	5,000 and under 5,400...	15	9,600 and under 10,200..	23		
2,400 and under 2,600..	08	5,400 and under 6,000...	16	10,200 and under 12,000..	24		

(2) Monthly Salary Rate:

(a) Exclusive of overtime payments, fees, and bonuses)

1943		1942		1941	
INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER
Under $100....	01	$170 and under 180.....	09	$300 and under 320.....	17	$570 and under 620.....	25
$100 and under 110....	02	180 and under 190.....	10	320 and under 340.....	18	620 and under 680.....	26
110 and under 120....	03	190 and under 200.....	11	340 and under 370.....	19	680 and under 750.....	27
120 and under 130....	04	200 and under 220.....	12	370 and under 400.....	20	750 and under 850.....	28
130 and under 140....	05	220 and under 240.....	13	400 and under 440.....	21	850 and under 1,000.....	29
140 and under 150....	06	240 and under 260.....	14	440 and under 480.....	22	1,000 and over.....	30
150 and under 160....	07	260 and under 280.....	15	480 and under 520.....	23		
160 and under 170....	08	280 and under 300.....	16	520 and under 570.....	24		

(b) Exclusive of fees and bonuses but inclusive of overtime)

1943		1942		1941	
INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER	INCOME BRACKET	CODE NUMBER
Under $100....	01	$170 and under 180.....	09	$300 and under 320.....	17	$570 and under 620.....	25
$100 and under 110....	02	180 and under 190.....	10	320 and under 340.....	18	620 and under 680.....	26
110 and under 120....	03	190 and under 200.....	11	340 and under 370.....	19	680 and under 750.....	27
120 and under 130....	04	200 and under 220.....	12	370 and under 400.....	20	750 and under 850.....	28
130 and under 140....	05	220 and under 240.....	13	400 and under 440.....	21	850 and under 1,000.....	29
140 and under 150....	06	240 and under 260.....	14	440 and under 480.....	22	1,000 and over.....	30
150 and under 160....	07	260 and under 280.....	15	480 and under 520.....	23		
160 and under 170....	08	280 and under 300.....	16	520 and under 570.....	24		

8. EMPLOYMENT STATUS: Under each of the following years place the ONE CODE NUMBER corresponding to your activity during the major part of the year with respect to: (1) your GENERAL FIELD OF EMPLOYMENT; (2) your OCCUPATIONAL STATUS; (3) your SOURCE OF EMPLOYMENT; and (4) your FIELD OF SPECIALIZATION. DO NOT ENTER any item for any year prior to the one in which you received your bachelor's degree, or, if a nongraduate, the year in which you consider yourself to have entered the profession.

(1) GENERAL Field of Employment:

1943		1942		1941	
GENERAL FIELD OF EMPLOYMENT	CODE NUMBER	GENERAL FIELD OF EMPLOYMENT	CODE NUMBER	GENERAL FIELD OF EMPLOYMENT	CODE NUMBER
Chemistry.....	1	Other field of science or engineering.....	3		
Chemical Engineering.....	2	Any other field.....	4		

(2) Occupational Status:

1943				1942		1941	
OCCUPATIONAL STATUS	CODE NUMBER	OCCUPATIONAL STATUS	CODE NUMBER	OCCUPATIONAL STATUS	CODE NUMBER	OCCUPATIONAL STATUS	CODE NUMBER
Administration, nontechnical.	08	Editing and writing.....	18	Research industrial.....	01	Teaching, other.....	22
Administration, technical....	02	Library & information service.....	19	Retired.....	20	Technical service.....	10
Analysis and testing.....	04	Maintenance.....	23	Safety engineering.....	24	Other professional.....	15
Construction & installation..	21	Patents.....	13	Sales.....	09	Non-professional.....	17
Consultation, independent....	11	Postgraduate study.....	16	Teaching secondary school..	12	Unemployed.....	25
Design.....	14	Production.....	07	Teaching, college or university.....	03	Relief, direct.....	26
Development.....	06	Research in basic science.	05				

(3) Source of Employment:

1943		1942		1941	
SOURCE OF EMPLOYMENT	CODE NUMBER	SOURCE OF EMPLOYMENT	CODE NUMBER	SOURCE OF EMPLOYMENT	CODE NUMBER
Public authorities:		*Non-public organizations*—Cont'd		*Non-public organizations*—Cont'd	
Armed forces.....	0100	Private firm, company, etc.		Stone, clay, and glass products.....	2012
County government.....	1500	Mining.....	2001	Iron and steel and their products....	2013
Federal government.....	1200	Construction.....	2002	Nonferrous metals and their products.	2014
Municipal government.....	1300	Manufacturing:		Machinery.....	2015
State government.....	1100	Food.....	2003	Transportation equipment.....	2016
W.P.A. or work relief.....	1600	Textiles.....	2004	Other manufacturing industries.....	2017
Other public authority.....	1400	Paper and allied products.....	2005	Transportation, communication, and other public utilities.....	2018
Non-public organizations:		Chemical:		Trade, or service firm (other	
Consulting laboratory, firm or office.....	2200	Rayon.....	2006	than those listed separately).....	2019
Educational institution, exclusive of those under public authorities	2100	Paints, varnishes, and colors..	2007	Other private organizations.....	2020
Research institute.....	2300	Miscellaneous chemical industries.....	2008	Other non-public organizations.....	2500
Technical or trade association and publishing organization.....	2400	Petroleum and coal products..	2009	Retired.....	3100
		Rubber products.....	2010	Unemployed or direct relief.	4100
		Leather and leather products.....	2011		

(4) Field of Specialization:

1943		1942		1941	
FIELD OF SPECIALIZATION	CODE NUMBER	FIELD OF SPECIALIZATION	CODE NUMBER	FIELD OF SPECIALIZATION	CODE NUMBER
Agricultural chemistry.....	16	Laboratory apparatus and equipment...	30	Pharmaceuticals, biologicals, and vitamins.....	09
Biological and physiological chemistry (basic science).....	08	Leather and its manufactures.....	32	Public health, including water, sewerage, and sanitation.....	20
Ceramic industries, including glass and cement technology.....	24	Machinery, implements, and mechanical and electrical equipment.	29	Rubber and its products.....	30
Chemical engineering, general.....	07	Medical chemistry, including clinical	26	Synthetic fiber technology.....	25
Equipment for process industries....	31	Metallurgical technology, ferrous....	23	Synthetic resins and plastics.....	11
Explosives.....	18	Metallurgical technology, nonferrous.	21	Textiles and their products, exclusive of synthetic fiber technology.....	19
Fertilizers and insecticides.....	27	Motor vehicles	34	Transportation equipment other than motor vehicles.....	33
Foods and kindred products.....	03	Organic chemical technology.....	05	Other field of science or engineering.	13
Gas and fuels, natural and manufactured, and power generation...	22	Organic chemistry (basic science)....	06	Other non-professional.....	28
General chemistry (basic science)....	14	Paints, varnishes and lacquers.....	12		
Industrial chemistry, general.....	04	Paper and forest products, including naval stores.....	17		
Inorganic chemical technology, including heavy chemicals.....	15	Physical, analytical, and inorganic chemistry (basic science).....	01		
		Petroleum and its products.....	02		

U. S. GOVERNMENT PRINTING OFFICE: 1946