1972

Report of

Chemists' Salaries

Based on the 1972 Comprehensive Survey
of ACS Members' Economic Status

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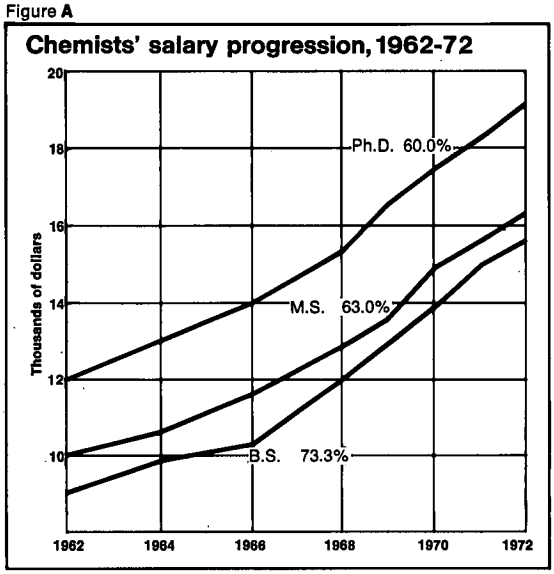
In an era of economic retrenchment, emphasized by President Nixon's New Economic Program, trends in chemists' salaries become a matter of national as well as professional concern. Hence, the fact that their 1972 salaries are 4.6% higher on the average than a year ago, according to this year's ACS comprehensive salary survey, can be viewed with mixed emotions. Mixed, first, because this improvement betters the 3.5% growth for the year ending March 1, 1972 of the frequently misunderstood Consumer Price Index. Second, because it is less than the allowable maxima of Phase II of the NEP, 5.5%.

Comparison with other data, underscores the second of these observations, namely that salary improvements reported by chemists this year are not as attractive as they might be under other conditions. For example, the 4.6% increase is less than the annual average of salary gains for all chemists during 1960-70, viz., 5.3% (C&EN, March 20, 1972, pp. 43-44). Moreover, it is considerably less than the average improvement recorded at any of the principal degree levels during the ten-year period 1962-72 (Fig. A).

As the accompanying graph shows, bachelors recorded an average annual improvement of 7.3% during that era, masters 6.3%, and doctors 6.0%. The comparable improvement rates and the actual 1971 and 1972 median salaries are as follows: bachelors, up 4.0% from $15,000 to $15,600; masters, up 4.5% from $15,600 to $16,300; and doctors, up 4.9% from $18,300 to $19,200. It should be emphasized that these rates include all chemists regardless of employer, work activity, field of chemistry, geography or gender.

Figure A



When viewed in detail, particularly as a function of work experience at the usual five percentiles, the accompanying salary and income data for chemists with up to a year of experience (Table 1) reflect the 7% general decline in 1971 starting salaries reported by the Society (C&EN, Nov. 1, 1971, pp. 28–31). Interestingly, though, not only beginning chemists encountered lower salaries this year. Figures reported at the 90th percentile for highly experienced respondents also were lower by $500–1,000 per year for masters and Ph.D.'s, although some observers may argue that this is a more tolerable situation for such individuals than for relative newcomers.

Otherwise, most salaries for 1972 follow general trends of the past. Some plateauing again is observable after 25-30 years of experience, although the pattern this year seems to be more spotty with regular salary improvements noted right up to the 40-year plus experience level in some cases. Oddly, though, this year, B.S. chemists seem to have experienced less plateauing than did masters and doctors. And for true degree equivalency, consider the situation of the 90th percentile group after 40 years of experience where bachelors and masters reported the same median salary, $30,000, and where Ph.D.'s were only slightly higher at $33,000. Quite obviously, there is some cross-over point both in experience and competency beyond which the chemist's degree is of considerably less importance in determining his economic worth.

Chemists sometimes overlook the fact that salary is but one component, although the major one, in their total compensation. Fringe benefits (especially the pension plan) are also compensatory devices whose value likewise is determined by employers. Other types of remuneration also help swell the chemist's earning power. Such income includes bonuses, royalties, consulting fees, honoraria and the like. Depending primarily on the type of work in which the chemist is engaged, these can furnish him with an increment averaging 3.7% in 1972 (Table 2). Not unexpectedly, chemists who teach or who have administrative responsibilities seem to do better in this respect than others. In 1972, teachers reported total income figures that were 9% higher than their corresponding salaries. Those in management did nearly as well with an 8.1% salary/income differential. Doing least well were chemists engaged in research and development, where the difference between salary and income averaged only 2.5%.

Employer and Work Activity

Reinforcing findings such as these is an array of other salary data accumulated from the Society's comprehensive salary survey which show that, aside from his degree, employer classification and job function are probably most pivotal in determining the chemist's economic status. In fact, general salary figures such as those shown in Table 1 furnish only a broad indicator of economic trends in the profession, rather than offering specific information to help the individual chemist evaluate his own situation. While there is reason to question the statistical validity of salary lumping such as this, there is merit to such an approach if only in terms of understanding how the profession as a whole is faring economically.

More specific guidance comes from examination of groups of chemists who work for the same type of employer or who generally are engaged in a uniform type of work activity (Table 3). In this case, sharp differences in earning power evidence themselves. Most noticeable this year is the top rung position occupied by chemists in government employ, most of them likely with the federal Civil Service. As in 1971, these respondents to the Society's survey reported the highest overall median salaries, a ranking held in previous years either by self-employed chemists or by those working in industry. This position of economic superiority by government-employed chemists was not restricted to any one degree level, either. To illustrate, at the three degree levels in increasing order their overall median salaries this year were $16,900, $17,800, and $21,900, respectively. In contrast, their industrial counterparts received $15,700, $17,200, and $21,000,

Table 1
Chemists' Salaries and Incomes by Percentiles and Experience

Percentile rank	YEARS OF EXPERIENCE ≤1		2–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Overall	
	THOUSANDS OF DOLLARS																					
	Salary[a]	Income[b]	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income
Lower 10%																						
Bachelors	$ 6.3	$ 6.3	$ 7.5	$ 8.0	$10.0	$10.0	$11.5	$12.0	$12.4	$12.9	$12.5	$12.8	$12.6	$13.2	$12.7	$13.0	$13.0	$13.4	$12.0	$12.0	$10.2	$10.7
Masters	6.6	6.6	8.3	8.6	9.9	10.0	11.0	11.4	12.0	13.0	13.0	13.5	13.1	14.0	13.5	14.0	11.4	13.4	11.5	11.5	10.8	11.0
Doctors	7.2	7.2	8.3	8.4	11.3	12.0	13.3	14.7	15.0	15.6	16.0	17.0	16.3	18.0	16.0	16.9	16.3	16.7	12.9	13.0	11.5	12.5
Lower 25%																						
Bachelors	7.5	7.5	9.1	9.5	11.2	11.5	13.0	13.3	14.3	14.6	15.0	15.2	15.0	15.7	16.0	16.5	16.2	16.7	15.0	15.0	12.5	13.0
Masters	8.4	9.0	9.8	10.2	11.4	11.8	13.0	13.5	14.6	15.1	15.0	16.3	16.0	16.3	16.0	16.5	16.0	16.5	13.0	13.2	13.0	13.5
Doctors	8.0	8.0	11.0	11.8	13.0	14.5	15.9	17.0	18.3	19.2	19.1	20.0	20.0	21.0	20.0	21.0	19.2	20.0	17.0	18.0	15.3	16.0
Median																						
Bachelors	8.8	9.0	10.8	11.0	12.8	13.0	15.0	15.2	16.4	16.8	17.5	18.0	18.5	19.2	19.3	20.0	20.0	20.0	17.0	18.4	15.6	16.0
Masters	10.6	10.8	11.6	11.9	13.2	13.5	15.4	16.0	17.1	17.7	18.7	19.4	20.0	20.1	19.2	20.0	19.3	21.0	16.6	17.9	16.3	17.0
Doctors	11.0	12.0	14.7	15.2	17.3	17.6	19.5	20.0	21.3	22.3	23.0	24.2	24.0	25.0	24.9	26.0	23.9	25.0	22.3	25.0	19.2	20.0
Upper 25%																						
Bachelors	10.0	10.0	12.0	12.0	14.3	14.6	17.4	18.0	18.9	20.0	20.6	22.0	22.0	23.5	24.0	25.0	24.1	25.6	22.5	24.8	19.5	20.0
Masters	11.5	12.0	13.0	13.4	15.1	15.6	17.5	18.0	20.0	20.3	22.0	22.5	24.0	25.0	23.0	24.0	25.2	27.0	26.0	27.0	20.0	21.0
Doctors	15.4	15.6	17.2	17.5	19.5	20.0	22.2	23.4	25.0	26.0	27.0	29.5	29.0	31.5	30.0	32.0	30.0	33.0	28.0	30.0	23.6	25.0
Upper 10%																						
Bachelors	11.0	11.0	12.9	13.2	16.0	16.6	20.0	20.2	21.9	23.8	25.0	26.3	26.5	30.0	30.0	32.5	30.0	33.3	30.0	34.0	24.0	25.0
Masters	12.2	13.2	14.4	15.0	16.9	17.8	20.0	21.0	23.0	24.5	25.0	28.0	28.1	30.0	28.0	30.0	32.5	38.0	30.0	32.2	24.5	26.0
Doctors	16.7	17.0	18.6	19.0	21.3	22.4	25.0	27.0	29.0	31.0	32.0	35.0	35.0	39.0	36.0	40.0	37.0	42.0	33.0	36.0	29.0	31.0

a Salary before deductions for income tax, Social Security, retirement, and the like, exclusive of bonuses, overtime, summer teaching, or rental or subsistence allowances.
b Income includes salary before deductions, plus bonuses, royalties, fees, honoraria, and the like.

respectively. Salaries for self-employed chemists were slightly lower still. Least well off, as usual, were chemists employed full time in educational institutions where the median salary for B.S. chemists was $8,800, only about half of the government figure. Chemists working for nonprofit employers were generally intermediate on the salary scale.

Table 2
Salary–Income Differentials Compared

	Salary	Income	Differential
Overall			
Bachelors	$15,600	$16,000	2.5%
Masters	16,300	17,000	4.3
Doctors	19,200	20,000	4.2
Weighted Average			3.7%
Management			
Bachelors	$20,000	$22,000	10.0%
Masters	21,000	23,000	9.5
Doctors	26,300	28,100	6.4
Weighted Average			8.1%
Research & Development			
Bachelors	$15,100	$15,600	3.3%
Masters	16,500	17,000	3.0
Doctors	19,600	20,000	2.0
Weighted Average			2.5%
Teaching			
Bachelors	$ 8,500	$ 8,600	1.2%
Masters	12,000	13,000	8.3
Doctors	14,900	16,300	9.4
Weighted Average			9.0%
Marketing & Production			
Bachelors	$14,500	$15,000	3.4
Masters	16,100	17,000	5.6
Doctors	19,200	20,000	4.2
Weighted Average			4.0%
Other			
Bachelors	$15,000	$15,600	4.0
Masters	14,500	15,500	6.9
Doctors	18,300	19,600	7.1
Weighted Average			5.9%

Even more telling, is the observation that government chemists' salaries in 1972 improved 5.5% over 1971 on the average, whereas salaries in industry went up by only 4.9%. So in addition to the usual perquisites of attractive fringes (notably generous leave schedules and an immediately vesting pension plan) and a certain assumed tenure, government employees now can boast not only higher salaries than those in industry, but also salaries whose rate of progression is better than in the private sector.

Table 3
Chemists' Median Salaries by Employer

THOUSANDS OF DOLLARS

	Bachelors			Masters			Doctors		
	1971	1972	Change	1971	1972	Change	1971	1972	Change
Employer									
Industry (59.8%)[a]	$15.0	$15.7	4.7%	$16.4	$17.2	4.9%	$20.0	$21.0	5.0%
Educational Inst. (25.3%)	8.8	8.8	0.0	11.4	12.0	5.3	14.2	14.9	4.9
Government (10.2%)	16.0	16.9	5.6	17.0	17.8	4.7	20.7	21.9	5.8
Nonprofits (3.5%)	12.0	12.6	5.0	13.0	14.1	8.5	19.0	18.9	-0.5
Self employed (0.7%)	17.5	15.5	-11.4	18.0	15.8	-12.2	21.0	20.0	-4.8
Other (0.5%)	13.6	15.0	10.3	16.7	na	na	19.2	19.4	1.0
	Industry	Educ. Inst.	Gov't.	Industry	Educ. Inst.	Gov't.	Industry	Educ. Inst.	Gov't.
Years									
≤1	$ 9.6	na	na	na	na	na	$15.9	$ 8.5	na
2–4	11.0	$ 8.0	$11.6	$12.4	$ 9.1	na	17.3	11.0	$15.8
5–9	12.7	8.3	14.1	14.0	10.3	$15.1	19.0	13.0	18.7
10–14	15.0	na	16.8	16.0	12.3	16.5	21.1	15.4	21.2
15–19	16.3	na	17.7	18.0	13.6	17.5	22.5	18.0	22.0
20–24	17.6	na	18.0	19.3	13.7	20.0	24.3	19.0	24.9
25–29	18.5	na	19.0	20.4	15.0	21.0	25.0	21.1	25.8
30–34	19.2	na	21.1	20.0	15.0	20.6	25.0	22.0	27.0
35–39	20.0	na	20.0	21.0	13.5	na	25.0	20.7	25.7
40+	17.2	na	na	20.0	13.5	na	25.0	20.0	na
Distribution	79.0%	3.5%	13.5%	66.8%	17.9%	10.5%	47.7%	38.7%	8.4%

Insufficient salary data:	B.S.	M.S. Distribution	Ph.D.
Nonprofits	2.2%	3.6%	4.2%
Self employed	1.1	0.7	0.5
Other	0.7	0.5	0.5

a Overall distribution. na = not available

An examination of industrial chemists' salaries (Table 4) shows a generally uniform improvement over 1971 levels. Bachelors' medians were up 4.7%, masters 4.6%, and Ph.D.'s 5.0%, relatively uniform gains which typify the kind of homogeneity that might be expected from this group. In general, too, salary patterns for industrial chemists were reflective of those for the profession as a whole. However, since some 60% of all respondents this year were from industry, their data naturally tend to dominate the more generalized array of salary findings.

Teachers, in contrast, while accounting for only one fourth of respondents this year, earned salaries several thousands of dollars less than did industrial chemists, or anyone else for that matter. In fact, whether looked at either by work activity or by type of employer, teachers invariably achieved this unenviable economic position. Hence, the 9% income add-on that they reported probably is well appreciated and useful in making up for this salary deficiency.

Somewhat encouraging, though, is the observation that salaries for chemists in educational institutions were higher than a year ago, at least for masters and doctors. Such was not the case for self-employed chemists, who, for the second year running, suffered a serious decline (8.9%) in their earnings. Bachelors' and masters' salaries were 11-12% lower than in 1971, while those

Table 4
Industrial Chemists' Salaries by Percentiles and Experience

Percentile rank	YEARS OF EXPERIENCE ≤1	2–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40+	Overall
	THOUSANDS OF DOLLARS										
Lower 10%											
Bachelors	$ 7.7	$ 8.7	$10.2	$12.0	$12.5	$13.0	$12.9	$12.8	$13.0	$12.0	$11.0
Masters	na	10.2	11.6	12.6	13.7	14.3	14.9	15.0	14.5	12.0	12.0
Doctors	12.0	15.6	16.6	17.6	18.2	18.6	19.0	18.6	17.3	16.0	16.6
Lower 25%											
Bachelors	8.5	10.0	11.4	13.0	14.3	15.1	15.0	16.0	16.2	15.0	12.8
Masters	na	11.2	12.6	14.5	15.9	16.9	17.0	16.5	17.0	15.0	14.4
Doctors	14.0	16.4	17.8	19.2	20.1	20.9	21.6	22.0	20.2	18.8	18.3
Median											
Bachelors	9.6	11.0	12.7	15.0	16.3	17.6	18.5	19.2	20.0	17.2	15.7
Masters	na	12.4	14.0	16.0	18.0	19.3	20.4	20.0	21.0	20.0	17.2
Doctors	15.9	17.3	19.0	21.1	22.5	24.3	25.0	25.0	25.0	25.0	21.0
Upper 25%											
Bachelors	10.0	12.0	14.0	17.0	18.9	21.0	22.0	24.0	24.7	22.2	19.8
Masters	na	13.5	15.5	18.0	20.2	22.1	25.0	24.0	26.3	30.0	21.0
Doctors	16.8	18.3	20.5	23.5	25.5	28.6	31.0	31.0	32.6	30.0	25.0
Upper 10%											
Bachelors	10.8	13.0	15.6	19.9	22.0	25.0	27.5	30.0	31.0	30.0	24.3
Masters	na	14.5	17.3	20.8	23.5	26.0	30.0	30.0	34.5	42.5	25.0
Doctors	17.3	19.5	22.2	26.5	30.0	34.0	37.5	40.0	40.9	36.0	30.5

na = not available

for doctors dropped 5%. As much as anything, this is still likely due to a general deterioration in the national economy and the ultimate impact on small businesses, such as chemist consultantships.

Among the many kinds of activities in which chemists are apt to engage, management continues to be the most rewarding (Table 5). With overall medians ranging between $20,000 and $26,000, it's no small wonder that so many chemists aspire to move from the bench to a desk. Even more illustrative of this situation is the observation that the average Ph.D. manager reported a 1972 salary in the $20,000 bracket after only 5-9 years of experience. Elsewhere, it takes the R&D chemist about 10 to 14 years to move this far up the salary ladder. Chemists in marketing, production, quality control, and technical services require 15-19 years, and teachers take 35-39 years to achieve this level. But while managers may enjoy a higher economic position overall, it is interesting to observe that this year research and development chemists posted larger salary gains, 5.7%, than did chemist administrators, 3.6%. So some hope for a better economic future for research chemists may exist.

Field of Chemistry

Among chemists working in identifiable chemistry specialties, polymer chemists were apparently being best paid in 1972 at $17,000 for bachelors, $17,800 for masters, and $21,000 a year for doctors (Table 6). Polymer chemistry was segregated by ACS as a distinct salary specialty

Table 5
Chemists' Salaries by Work Activity

	YEARS OF EXPERIENCE										
	≤1	2–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40+	Overall
	THOUSANDS OF DOLLARS										
Management (16.7%) [a]											
Bachelors	na	na	$14.4	$17.0	$19.3	$21.5	$21.2	$23.0	$22.8	na	$20.0
Masters	na	na	15.5	17.1	20.4	23.2	24.0	23.8	25.0	na	21.0
Doctors	na	na	20.6	23.2	26.0	27.5	29.4	30.0	29.8	$28.8	26.3
Research & Development (49.3%)											
Bachelors	$ 9.1	$11.0	12.9	15.0	16.4	17.0	18.4	18.6	19.9	17.3	15.1
Masters	na	12.0	13.8	15.7	17.0	18.5	19.5	19.0	19.7	na	16.5
Doctors	12.0	16.4	18.5	20.5	21.6	22.7	23.5	24.0	23.1	24.5	19.6
Teaching (18.8%)											
Bachelors	na	7.7	na	na	na	na	na	na	na	na	8.5
Masters	na	8.9	10.5	12.3	13.8	13.5	15.0	14.8	12.2	na	12.0
Doctors	11.0	11.5	13.0	15.0	17.2	18.0	19.7	19.0	20.0	19.0	14.9
Marketing & Production (12.3%)											
Bachelors	9.3	10.8	12.5	14.5	15.7	16.0	16.7	17.3	17.0	na	14.5
Masters	na	12.0	13.5	16.4	17.5	18.6	19.8	17.8	18.3	na	16.1
Doctors	na	16.5	18.4	19.1	21.0	22.0	na	21.4	na	na	19.2
Other (3.0%)											
Bachelors	na	na	12.3	16.2	na	15.8	na	na	na	na	15.0
Masters	na	na	na	na	na	na	na	na	na	na	14.5
Doctors	na	12.7	15.0	na	20.1	na	na	25.0	na	na	18.3

[a] Proportion of respondents in each category. na = not available

only within the past three years, a step which, in retrospect, would seem to be more than justified in view of the resulting salary data for this group.

In 1972, physical chemists were next best remunerated at $16,100, $17,000, and $19,000 for the three degree levels, respectively. Biochemists present a mixed picture. Like analytical chemists, bachelors in this specialty are not very well paid at about $14,000 annually. Nor were M.S. biochemists particularly well remunerated at $15,000. But Ph.D.'s do very well at $19,400, besting all other specialty categories except polymer chemistry. As much as anything, this may be due in large part to the increasing national emphasis on health care and the migration of many doctoral level biological chemists into higher paying clinically related functions.

Geography

There were insufficient data from this year's survey to calculate an acceptable number of salary medians for all experience and degree levels in each of the nine U.S. census divisions normally employed for these reports. However, the overall medians in each region do tell a story (Fig. B). Apparently, the best salaried chemists are to be found along the lower Eastern Seaboard, with figures in the Middle and South Atlantic States essentially the same for each of the three degree levels, namely, bachelors, $16,500; masters, $17,000; and doctors, $20,000. Trying to identify the next highest paying geographic area is hard because of a mix of findings. Thus, while Ph.D.'s in the East North Central States do well at about $19,000, bachelors in the same area reported only $15,100 and thereby trailed the national median of $15,600 as well as their

Table 6
Chemists' Salaries by Field

	YEARS OF EXPERIENCE										
	≤1	2–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40+	Overall
	THOUSANDS OF DOLLARS										
Analytical Chemistry (20.0%)[a]											
Bachelors	$ 8.9	$10.8	$12.6	$15.0	$15.8	$16.0	$16.0	$18.1	$18.2	na	$14.4
Masters	na	12.0	13.1	15.5	17.0	18.5	18.4	18.3	16.8	na	15.9
Doctors	11.1	15.4	16.9	18.4	20.1	21.8	22.5	23.0	20.3	na	18.0
Biochemistry (12.6%)											
Bachelors	na	8.8	11.0	13.5	16.5	16.2	na	18.2	na	na	14.0
Masters	na	10.8	12.2	15.0	15.9	17.9	17.1	na	na	na	15.0
Doctors	11.5	12.5	17.0	19.2	21.9	23.6	25.0	25.0	24.4	25.0	19.4
Inorganic Chemistry (8.7%)											
Bachelors	na	8.8	12.0	14.7	16.3	18.9	17.3	21.2	20.2	na	16.0
Masters	na	9.1	11.0	13.2	16.0	17.0	16.2	16.0	na	na	14.2
Doctors	10.2	11.5	14.5	16.0	20.0	21.6	23.0	22.0	na	na	16.2
Organic Chemistry (23.3%)											
Bachelors	na	11.3	13.0	14.5	16.8	18.1	20.0	20.0	21.0	na	16.3
Masters	na	12.0	13.3	15.5	17.0	19.0	20.0	21.0	24.2	na	16.6
Doctors	10.6	15.6	17.5	19.4	21.0	22.5	24.0	25.0	22.9	$22.0	18.7
Physical Chemistry (11.3%)											
Bachelors	na	na	12.9	15.3	18.3	17.9	na	na	na	na	16.1
Masters	na	na	13.5	15.0	18.5	20.2	23.8	na	na	na	17.0
Doctors	10.7	13.9	15.0	19.0	21.4	23.1	22.2	25.0	24.9	22.7	19.0
Polymer Chemistry (12.9%)											
Bachelors	na	11.9	13.1	15.6	18.7	19.0	20.0	20.1	21.0	na	17.0
Masters	na	na	14.2	17.5	18.0	19.5	21.6	19.8	na	na	17.8
Doctors	na	17.4	19.0	21.0	22.4	24.0	24.9	25.0	26.0	na	21.0
Other Specialties (11.2%)											
Bachelors	na	10.8	12.8	15.1	16.0	18.0	20.0	19.6	20.0	na	16.6
Masters	na	11.4	14.2	15.4	18.0	19.4	20.8	20.2	20.0	na	17.7
Doctors	na	16.0	18.9	21.0	22.9	23.0	25.5	24.2	24.9	na	21.0

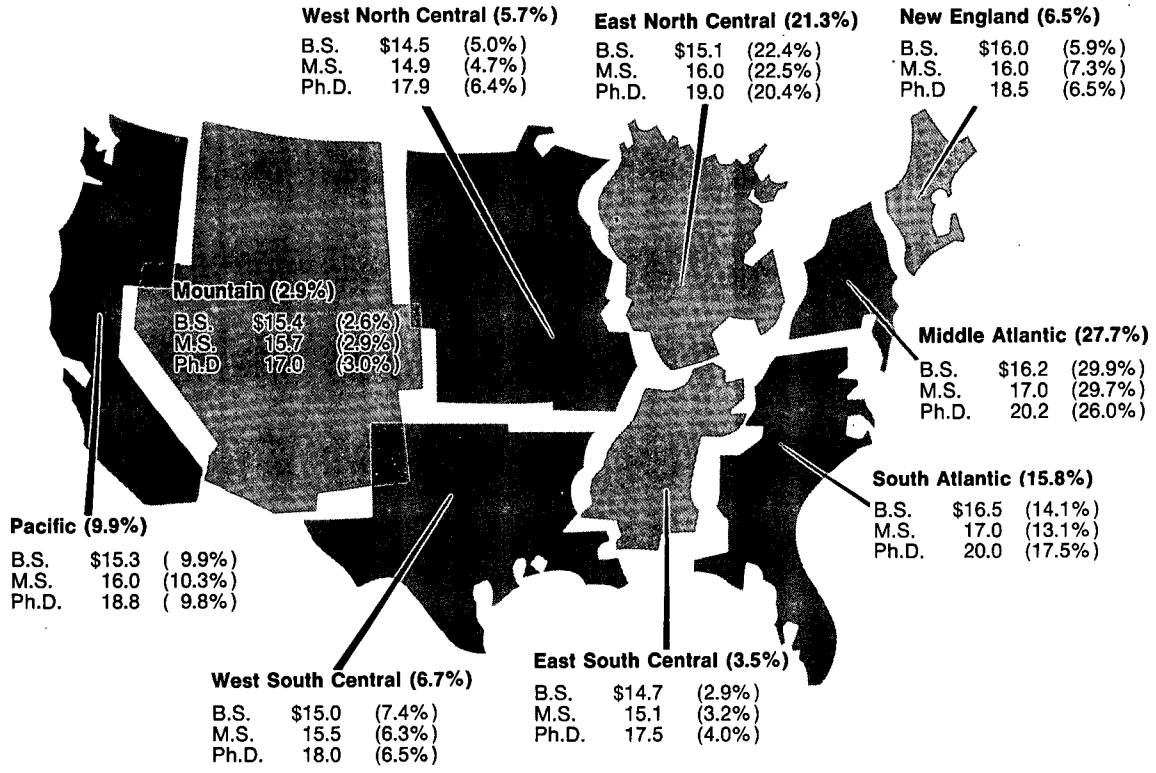
[a] Proportion of respondents in category. na = not available

counterparts on the Pacific Coast ($15,300) and in New England ($16,000). And while West North Central States bachelors reported the lowest salaries of all, $14,500, Ph.D.'s in this area, with $17,900, did better than doctors in the Mountain States or in the East South Central States, even though all three areas were well below the national figure of $19,200.

If anything, such findings probably begin to show that there are factors other than geographic location of employment (e.g., employer and work activity) which are more apt to affect the chemist's salary in the long run. At this point, though, it can probably still be safely said that salaries on the East Coast are better than those in the West by a thousand dollars a year or more. But these differences and those elsewhere may be more a reflection of the types of employers to be found in these locales than anything else. A good illustration of this is the Mountain States area in which there is a notable paucity of major industrial employment. Hence, the somewhat lower medians reported in this region are more reflective of academic and small business employment than anything else.

Figure **B**

Chemists' overall median salaries by geographic region[a]



How to read: Using New England as an example, 6.5% of responding chemists work in this U.S. census division; 5.9% of all B.S. chemists work there and they reported an overall median salary of $16,000 in 1972.

a Thousands of dollars.

Women Chemists' Salaries

The surge of interest in women's liberation, precipitated in part by Constitutional amendments calling for equality of the sexes, focuses increasing attention on the Society's reports of salary differentials between men and women chemists. The 1972 findings again show that such differentials exist almost anywhere one wants to look for them (Table 7). On an overall basis, male bachelors this year reported a median salary of $16,000 vs. only $12,500 for women, a 28.0% differential. At the M.S. level, the comparable figures were $17,000 vs. $12,500, a 36.0% margin. Rounding out the picture, for Ph.D.'s the respective salaries for men and women chemists were $19,400 and $14,500, accounting for a 33.8% difference. Overall, 6.8% of responses to the survey this year were from women chemists.

In part, such differences can be ascribed to a disproportionately high population of females in activities and in jobs that generally are regarded as being relatively low paying or, contrariwise, to a low population of women in higher paying situations (Table 8). Thus, while only 24.3%

of men reported this year that they worked for educational institutions where salaries are lowest, 37.5% of females worked in colleges or universities. Similarly, more than twice as many females as male respondents worked for non-profit institutions where salaries were lower than in industry or in government. For comparison, more than 60% of reporting males were to be found in industry this year, as against fewer than 40% of females.

The only anomaly in this general situation is in government, where more women chemists (14.5%) were to be found than were men (9.9%). Among these respondents, there was some semblance of salary equivalency, at least at the Ph.D. level where male chemists reported an overall median salary of $21,900 and females $21,300. However, this is about the only instance in the entire array of 1972 data in which the salaries of the two sexes are somewhat alike. Elsewhere major differences exist, suggesting that the doctrine of salary equivalency for men and women chemists, which now manifests itself in ACS's annual starting salaries, will be a long time extending to more experienced practitioners, perhaps as long as 20 years.

Table 7
Chemists' Salaries by Sex 1972

Years	B.S. Men	B.S. Women	M.S. Men	M.S. Women	Ph.D. Men	Ph.D. Women	Distribution Men	Distribution Women
			THOUSANDS OF DOLLARS					
≤1	$ 9.1	na	na	na	$11.2	na	90.2%	9.8%
2–4	10.9	$10.0	$12.0	$10.4	15.0	$10.0	90.6	9.4
5–9	13.0	11.7	13.5	12.0	17.5	13.0	90.9	9.1
10–14	15.0	13.1	15.8	12.6	19.6	15.0	91.6	8.4
15–19	16.6	14.0	17.6	13.5	21.5	15.8	92.2	7.8
20–24	17.8	14.8	19.0	15.9	23.2	16.3	92.7	7.3
25–29	19.0	14.9	20.0	14.2	24.0	20.0	92.8	7.2
30–34	19.6	na	19.6	na	25.0	18.4	93.0	7.0
35–39	20.0	na	19.6	na	24.0	na	93.1	6.9
40+	17.3	na	17.4	na	23.0	na	93.2	6.8
Overall	16.0	12.5	17.0	12.5	19.4	14.5	93.2	6.8

na = not available

Salary Characteristics

Normal salary reporting practice is to fix major parameters, such as degree, experience, employer, work activity, field of chemistry, geography and sex, and to rotate salaries about them. It is also interesting, though, to apply the converse process, namely to fix salaries at discrete levels and to examine the characteristics of chemists who populate these groupings. For the first time, ACS performed such an analysis this year using salary classes of under $10,000, $10,000-14,999, $15,000-19,999, $20,000-24,999, and over $25,000.

Not many surprises were found as a consequence of this exercise, however (Table 9). In the under $10,000 grouping were to be found a disproportionately high number of females (20.5% vs. 6.8% for all respondents) a larger number of chemists employed in educational institutions (54.8% vs. 25.3%), fewer managers (5.5% vs. 16.7%), more inorganic chemists (13.5% vs. 8.7%), more biochemists (17.6% vs. 12.6%) and comparatively few of the better renumerated polymer chemists (3.3% vs. 12.9%).

Table 8
Men and Women Chemists' Salaries Compared

	Bachelors				Masters				Doctors				Overall Distribution	
	Men		Women		Men		Women		Men		Women		Men	Women
	Salary	%[a]	Salary	%	Salary	%	Salary	%	Salary	%	Salary	%		
	THOUSANDS OF DOLLARS													
Employer														
Industry	$16.0	88.0	$12.3	60.5	$17.6	70.1	$13.5	40.7	$21.0	49.4	$19.0	14.1	61.3%	38.9%
Educational Institution	9.5	3.1	8.2	10.4	12.8	15.3	10.8	37.0	15.0	37.6	12.5	66.9	24.3	37.5
Government	17.1	13.9	15.3	20.5	18.0	10.2	15.8	12.3	21.9	8.4	21.3	10.1	9.9	14.5
Nonprofit	14.0	1.8	10.5	7.3	16.0	2.9	12.0	8.6	19.2	3.9	14.3	8.7	3.1	8.2
Work Activity														
Management	20.2	20.7	14.0	6.3	21.0	19.2	na	6.2	26.3	15.5	na	4.3	17.5	5.6
Research & Development	15.6	44.8	12.5	55.8	17.0	48.4	13.3	41.4	19.8	51.8	16.8	45.3	49.4	47.9
Teaching	9.0	1.5	7.8	5.1	12.5	13.6	11.2	29.9	15.0	27.6	13.0	44.2	18.2	25.7
Marketing & Production	14.6	29.4	12.0	22.3	16.5	15.9	12.0	10.5	19.2	3.0	na	1.4	12.3	11.7
Other	15.2	3.6	12.9	10.5	16.0	2.9	12.3	12.0	19.0	2.0	na	4.8	2.5	9.0
Field														
Analytical	14.7	34.6	12.6	45.8	16.2	25.1	12.2	22.3	18.0	10.7	13.5	7.0	19.6	25.1
Biochemistry	15.7	4.0	10.5	14.7	16.0	5.9	11.9	16.6	20.0	17.4	14.3	38.2	11.8	23.3
Inorganic	16.3	7.3	12.0	5.9	15.0	11.0	11.5	19.6	16.5	8.3	11.3	10.6	8.5	11.7
Organic	16.8	17.1	13.0	12.0	17.0	20.7	12.7	14.9	18.9	28.1	14.5	22.2	23.8	16.4
Physical	17.0	4.1	na	3.6	17.8	7.2	na	5.7	19.1	16.6	15.5	13.8	11.6	7.7
Polymer	17.2	16.5	na	3.6	17.8	14.7	na	2.7	21.0	11.9	na	2.3	13.4	2.9
Other	17.0	16.4	12.3	14.5	18.0	15.5	13.5	18.1	21.2	7.0	18.0	5.9	11.0	12.8

a Percent in category. na = not available

Table 9
Chemists' Salary Level Characteristics[a]

	<$10,000 (6.0%)[b]	$10–14,999 (23.1%)	$15–19,999 (32.5%)	$20–24,999 (21.7%)	≥$25,000 (16.7%)
Sex					
Men	79.4%	87.2%	95.4%	98.0%	98.9%
Women	20.5	12.6	4.4	1.8	1.1
Degree					
<B.S.	0.4	1.0	0.7	0.4	0.3
B.S.	36.9	39.8	30.4	22.6	20.8
M.S.	18.9	22.8	21.1	17.3	14.7
Ph.D.	43.6	36.2	47.5	59.4	63.9
Employer					
Industry	24.9	49.4	67.2	71.1	69.7
Self employed	2.7	0.6	0.6	0.6	1.6
Educational Institution	54.8	38.1	17.7	12.6	13.1
Government	7.2	6.7	10.0	11.5	11.6
Nonprofit	6.6	3.3	2.9	3.0	3.1
Military, Peace Corps	2.9	1.1	0.6	0.5	0.5
Other	0.6	0.6	0.8	0.5	0.3
Activity					
Management	5.5	5.1	11.4	24.2	54.0
Research & Development	47.0	37.2	55.2	54.3	31.3
Teaching	22.3	33.5	14.4	8.9	6.6
Marketing & Production	14.2	19.6	14.8	9.4	5.2
Other	9.2	4.1	4.0	3.0	2.8
Field					
Analytical	22.6	28.1	21.4	13.5	9.7
Biochemistry	17.6	10.3	10.4	12.6	16.3
Inorganic	13.5	11.4	7.8	5.8	5.7
Organic	20.7	21.2	23.1	22.9	24.9
Physical	10.0	9.7	10.1	12.9	12.7
Polymer	3.3	7.4	13.7	17.7	14.7
Other	7.0	9.1	11.4	12.1	12.7

a Full time employed only. Distribution shown by category. "No responses" omitted.
b Proportion in each salary group.

These categories and characteristics tended to change consistently, either in increasing or decreasing order, as higher salary groupings were examined. To illustrate: at the top $25,000-plus bracket, the proportion of male chemists was almost 100%. This grouping also found that the number of Ph.D.'s reporting had grown significantly, as had also chemists in industry. Conversely, chemists in educational institutions dropped to only 13% of the total; whereas the proportion of managers grew to more than 50%. Also, the R&D category dropped to about 30%. Teaching declined significantly, as did also marketing and production as work activities. Conversely, polymer chemistry more than quadrupled to nearly 15% while inorganic chemistry dropped to less than 6%.

Overall, categories that seem relatively unaffected population-wise by any grouping of salaries included government chemists, non-profit employed chemists, organic and physical chemists and, to a lesser extent, biochemists.

The Survey

The American Chemical Society's salary reporting program was initiated in 1941 under the auspices of the Committee on Economic Status (C&EN, *20*, Nos. 20, 22, 23, 24; 1942). In subsequent years, responsibility for this undertaking was assumed by the Committee on Professional Relations and Status, and recently reverted to the ad hoc Committee on Economic Status.

Data for the 1972 comprehensive salary survey were solicited from about half the Society's U.S. members, exclusive of those with student or emeritus status. In late February, questionnaires were distributed to 44,188 members, and by mid-April, 25,322 forms had been returned, a 57.3% response. Of these, 19,327 valid returns from chemist members were analyzed for this report. An additional 2,905 replies from chemical engineer members were not considered at this time because it was felt this sampling was too small to be statistically valid. These data are being coordinated with the American Institute of Chemical Engineers as part of an exploratory program to coordinate the salary survey and reporting activities of AIChE and ACS for the respective disciplines of chemical engineering and chemistry.

The remaining 3,090 replies could not be used, principally because pertinent items (i.e., field degree, salary, and employment status) were not completed. Also, only chemist members reporting full-time employed status were included in this report. Those signifying they were part-time employed, retired, or unemployed were omitted.

Acknowledgment

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AMERICAN CHEMICAL SOCIETY
1972 Comprehensive Salary Survey

Please check or otherwise supply information for the one classification in each of the major categories below which most aptly describes your present position and status as a practicing chemist or chemical engineer in 1972.

A. Sex: (1) ____ Male (2) _____ Female

B. Highest degree earned: (1) ____ Bachelors (2) ____ Masters (3) ____ Doctors (4) ____ Less than bachelors

C. Geographic location of employment: Zip Code: _____

1. _____ Washington
   _____ Oregon
   _____ California
   _____ Alaska
   _____ Hawaii
2. _____ Montana
   _____ Idaho
   _____ Wyoming
   _____ Nevada
   _____ Utah
   _____ Colorado
   _____ Arizona
   _____ New Mexico
3. _____ North Dakota
   _____ Minnesota
   _____ South Dakota
   _____ Iowa
   _____ Nebraska
   _____ Kansas
   _____ Missouri
4. _____ Oklahoma
   _____ Arkansas
   _____ Texas
   _____ Louisiana
5. _____ Wisconsin
   _____ Michigan
   _____ Illinois
   _____ Indiana
   _____ Ohio
6. _____ Kentucky
   _____ Tennessee
   _____ Mississippi
   _____ Alabama
7. _____ New York
   _____ Pennsylvania
   _____ New Jersey
8. _____ Delaware
   _____ Maryland
   _____ West Virginia
   _____ District of Columbia
   _____ Virginia
   _____ North Carolina
   _____ South Carolina
   _____ Georgia
   _____ Florida
9. _____ Maine
   _____ New Hampshire
   _____ Vermont
   _____ Massachusetts
   _____ Connecticut
   _____ Rhode Island

D. Employment Status: (1) ____ Full-time (2) ____ Part-time (3) ____ Unemployed (4) ____ Retired

E. Please check the one category which is most applicable to your present principal employer:

(1) ____ Private industry or business
(2) ____ Self-employed
(3) ____ Educational institution
(4) ____ Federal, state, or local government
(5) ____ Non-profit institution, including hospitals
(Ø) ____ Military, Peace Corps, Public Health Service
(6) ____ Other

F. Please check the one category below which most closely approximates your present position:

(1) ____ Management or administration
(2) ____ Research and/or development
(3) ____ Teaching
(4) ____ Marketing, production, quality control, and technical services
(5) ____ Other

G. Please designate the one scientific specialty from the list below which is most closely related to your present principal employment:

(1) ____ Analytical chemistry
(2) ____ Inorganic chemistry
(3) ____ Organic chemistry
(4) ____ Physical chemistry
(5) ____ Biochemistry
(6) ____ Other chemical specialties
(7) ____ Chemical engineering
(8) ____ Polymer Chemistry

H. 1972 Basic Annual Salary associated with your principal professional employment to the nearest $100. $ _____

(Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work. Do not include rental or subsistence allowances.)

I. Estimated Gross Annual Professional Income (Jan. 1 to Dec. 31, 1972) from all professional activities. $ _____

(Income is ALL payment for professional activities including basic salary before deductions, plus bonuses, royalties, fees, honoraria, etc.)

J. How many years of professional work experience, including teaching, have you had? _____

What is your opinion? Assuming acceptance of a suitable program by the governing bodies of the ACS, would you be willing to pay a one-time $10 assessment levied against all fully employed ACS members (excluding unemployed, students, emeritus, etc.) this year with the understanding that such funds would be used solely to assist unemployed members in finding jobs, for creating new jobs, and otherwise improving the professional and economic welfare of the chemist and chemical engineer? _____ (1) Yes _____ (2) No