Mixed Salary Picture for Literature Chemists

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Compensation patterns among literature chemists tend to be different from those for the chemical profession as a whole. Ph.D.s generally earn more than other chemists, while bachelors and masters earn less. More than 40% of these specialists are women, as against 7% over-all. Both men and women literature chemists' salaries, while different from each other, are higher than for the chemical profession generally. Literature chemists' salaries tend to plateau earlier than for the rest of the profession. Otherwise, salary factors such as type of employer, work activity, and field of training affect their salaries in about the same way they do for all of the profession. A major exception is the finding that government salaries are considerably better than those for industry and also higher than salaries paid generally for chemists in government employ.

Literature chemists with a doctors degree earned considerably more in 1971 than the average U.S. chemist. Conversely, bachelors and masters degree holders were paid somewhat less. Specifically, Ph.D. members and affiliates of the Division of Chemical Literature reported a 1971 median salary of $19,900, 8.7% higher than the $18,300 profession wide median published earlier this year by ACS (C&EN, June 21, 1971, p. 64). Likewise, their total income of $21,300 was 11.5% higher than the national figure of $19,100 (Table I).

Doing less well were literature chemists with a bachelors degree who reported a 1971 median salary of $14,700, some 2.0% under the $15,000 national figure. Their total income was $15,000, however. Economically, masters degree holders in the Division were virtually indistinguishable in many cases from bachelors. Their median salary of $14,700, for example, was the same as bachelors, and their total income was only marginally higher at $15,200. Moreover, an examination of M.S. degree holders' salaries at five percentile levels shows figures on a par with or even less than comparable salaries for bachelors.

Behind such general findings, though, lie other professional and economic data which help to explain these mixed observations, and which also would appear to more than amply justify this first salary survey among the Division's members. Some of their professional characteristics, for example, differ considerably from those of the profession as a whole. Principal among these is the finding that there are many more women literature chemists (43.5%) than in the profession generally (6.9%). And despite legislative efforts, Womens Lib, and a general movement towards standardization of salaries between the sexes, many women continue to earn less than men. Some observers point out, though, that women more frequently can be found in historically low paying positions. At any rate, men literature chemists with a bachelors degree reported a median of $17,400, whereas the salary for women was only $13,900, a 25% difference. Interestingly, though, both sexes' salary figures are more than $2,000 higher than the comparable over-all medians reported to ACS nationally by men and women chemists for 1971. Also, at the national level, the gulf between men and women B.S. chemists' salaries was wider—34% (Table II).

The same general observations hold true for Division members with a masters degree, although differences from national patterns are less pronounced. Among doctorate holders in chemical literature, the picture brightens. Not only is the differential between mens' and womens' salaries smaller (14.3%), but the salaries themselves are considerably above national medians. Male Ph.D.s reported a median of $20,000 and women $17,500. In comparison, the ACS national figures were $18,500 and $14,100 respectively.

Literature chemists differ from most other chemists in another major way. For the profession as a whole, approximately 40% of chemists have bachelors degrees, 20% have masters, and 40% are doctors. But among Division of Chemical Literature survey respondents, the distribution is about 30-40-30%. In large part, though, this may be a reflection of the finding that more than 40% of the Division's members are women, only 14% of whom hold doctors degrees. Too, in the field of chemical literature there are apt to be larger numbers of women with degrees in a library or information science and, as found elsewhere in this survey, salaries for such functions can be as much as a $1,000 a year below the median for all literature chemists.

OTHER SALARY PARAMETERS

A number of factors can affect the chemist's earning power. In this regard, literature chemists are not too different from the remainder of the profession. Besides sex and degree, the parameters employed by ACS when analyz-

Table I. Salaries and Income of Literature Chemists

	Bachelors		Masters		Doctors	
Percentile	Salary	Income	Salary	Income	Salary	Income
Lower 10%	$11.2[a]	$11.0	$ 9.7	$ 9.7	$14.2	$15.0
Lower 25%	12.7	12.7	12.3	12.4	16.8	17.4
Median	14.7	15.0	14.7	15.2	19.9	21.3
Upper 25%	17.9	18.5	17.8	18.5	24.3	25.9
Upper 10%	22.9	22.9	22.5	23.5	28.1	30.0
ACS median	$15.0	$15.1	$15.6	$16.0	$18.3	$19.1
Lit. % difference	−2.0	−0.7	−5.8	−5.0	8.7	11.5

[a] Thousands of dollars.

Table II. Men's and Women's Salaries Differ Widely

	Men		Women		Salary
	Salary	% Men	Salary	% Women	Differences
B.S.	$17,400	44.9	$13,900	55.1	25.2%
M.S.	17,000	45.7	13,800	54.3	23.2
Ph.D.	20,000	85.6	17,500	14.4	14.3
Distribution	56.5%		43.5%		

Table III. Experience Counts—Sometimes

Years	Bachelors Total	Bachelors Literature	Masters Total	Masters Literature	Doctors Total	Doctors Literature
<5	$ —	$14.0[a]	$ 9.4	$12.0	$ —	$16.5
5-9	12.9	13.7	13.6	14.4	15.1	20.0
10-14	15.0	15.4	13.5	15.0	17.3	20.0
15-19	14.5	14.5	15.5	15.8	17.7	21.5
20-24	15.6	18.5	16.0	15.5	20.1	21.0
25-29	15.2	—	14.4	16.1	20.0	—
30-34	16.8	—	17.0	—	24.3	—
>35	—	—	13.7	—	20.2	—

[a] Thousands of dollars.

ing salary data include experience, field of training, type of employer, work activity, and geographic locale.

With regard to experience, a somewhat disturbing observation surfaced from this survey, namely that the salaries of literature chemists plateau considerably earlier than for the profession as a whole. To illustrate, the salaries for most chemists show a levelling effect after 25 or 30 years of professional experience, whereas those for Division members exhibit this tendency at about the 20 year level. Moreover, if only literature experience is considered, this levelling can be observed as early as after only 15 years. One conclusion seems to be that the employers of literature chemists place a relatively early and somewhat definite upper limit on the compensation for these specialists (Table III).

The large majority, nearly two-thirds, of Division members in 1971 had received their degrees in chemistry, the survey found. This proportion would have been considerably higher, too—on the order of 80%—if M.S. degree holders were excluded. But conforming other observations, most masters reported their basic skills were acquired in the library and information science area, and as a consequence, only about 41% of respondents at this degree level had chemistry degrees. Otherwise, library or information science accounted for 18.8% and chemical engineering 4.7% of the group. The remaining 11.2% were classified as "Other" and included mathematics (0.2%) and computer science (0.2%) (Table IV).

Not unlike the rest of the profession, most literature chemists were employed in industry, 61.9%. But while industry generally is the best paying employer of chemists, this survey placed it in a definitely secondary position behind government. Industrial salaries ranged from $14,400 for bachelors, through $15,000 for master, to $21,600 for Ph.D.s. In contrast, the 10.9% of government employed literature chemists received median salaries of $20,000, $17,700, and $22,800 respectively. Too, these are considerably above the ACS reported government salaries for all the profession in 1971. It was determined that the experience frequency distribution of government respondents was

Table IV. Most Division Members Degreed in Chemistry

	Bachelors Salary[a]	Bachelors % in Field	Masters Salary	Masters % in Field	Doctors Salary	Doctors % in Field
Chemistry (65.3%)[b]	$14.5	82.1	$14.9	40.8	$20.0	83.3
Chemical Engineering (4.7%)	—	4.1	16.2	5.6	—	3.8
Library/information science (18.8%)	—	3.4	14.3	42.3	—	0.8
Other (11.2%)[c]	17.0	10.3	17.0	11.2	17.2	12.1

[a] Thousands of dollars. [b] Total in field, all degrees. [c] Includes mathematics (0.2%) and computer sciences (0.2%).

Table V. Other Salary Parameters

Employer	Bachelors Median Salary[a]	Bachelors % in Field	Masters Median Salary	Masters % in Field	Doctors Median Salary	Doctors % in Field
Industry (61.9%)[b]	$14.4	71.4	$15.0	58.9	$21.6	55.6
Educational Institution (13.4%)	—	4.0	12.0	15.7	16.3	20.3
Government (10.9%)	20.0	10.9	17.7	13.2	22.8	7.5
Nonprofit (10.9%)	14.4	10.9	17.4	9.7	19.1	12.8
Other (2.9%)	—	2.7	—	1.5	—	3.8
Work Activity						
Management (28.8%)	$19.7	24.3	$18.5	24.5	$24.6	39.8
Information scientist (36.6%)	13.9	46.9	14.2	34.7	17.9	28.6
Librarian (16.3%)	13.4	11.2	13.3	30.6	—	0.8
Teaching (5.1%)	—	0.7	—	1.5	15.9	15.0
Others (13.3%)	16.0	17.5	16.0	8.7	19.7	15.8
Specialty						
Management (24.5%)	$19.5	18.6	$18.0	22.8	$24.8	33.3
Literature/patent search (20.9%)	14.5	21.4	13.5	21.8	17.5	18.9
Library functions (18.3%)	13.7	14.5	14.0	30.6	—	4.5
Abstracting (10.4%)	12.7	17.2	13.1	6.7	19.4	8.3
Technical editing (7.4%)	16.5	9.7	—	4.1	17.4	9.8
Computer programming (6.4%)	16.5	9.7	18.5	5.2	—	4.5
Other (12.1%)[c]	15.3	9.0	14.2	8.8	19.5	20.5

[a] Thousands of dollars. [b] % in field, all degrees. [c] Includes 0.6% translating.

MIXED SALARY PICTURE FOR LITERATURE CHEMISTS

Table VI. Literature Chemists Have Eastern Bias

Region	Bachelors		Masters		Doctors	
	Median[a] Salary	% in Field	Median Salary	% in Field	Median Salary	% in Field
New England (4.7%)[b]	$—	2.1	—	4.1	$18.0	8.4
Middle Atlantic (40.4%)	15.0	39.3	14.5	41.8	20.9	40.0
South Atlantic (17.0%)	19.0	17.2	17.5	17.0	26.4	16.5
East North Central (24.7%)	14.3	30.3	15.2	21.3	18.4	23.7
West North Central (3.4%)	—	2.1	—	4.6	—	3.1
East South Central (1.7%)	—	0.7	—	1.0	—	3.8
West South Central (1.9%)	—	2.8	—	2.1	—	0.8
Mountain (0.4%)	—	0.0	—	0.5	—	0.8
Pacific (5.7%)	—	5.5	13.4	7.7	—	3.1

[a] Thousands of dollars. [b] % in region, all degrees.

similar to that of the total group, thereby eliminating the possibility of skewed data as a reason for these major salary differentials. So it would appear that the specialized services of literature chemists are valued by the Government.

As expected, median salaries for literature chemists employed in educational institutions are somewhat lower than the over-all figures. Salaries for Division members employed in nonprofit institutions however, tended to approximate more closely those in industry.

What literature specialists do also turns out to be an important component of their compensation pattern. About one-fourth perform management functions, for which, not unexpectedly, they are best remunerated as a class. Bachelors reported a 1971 salary of $19,700, masters $18,500, and Ph.D.s $24,600 (Table V).

The largest numbers of literature chemists, however, were employed as information scientists, about 37%. But their salaries were considerably lower: bachelors, $13,900, masters $14,200, and doctors $17,900. Some 16% of responding Division members indicated they functioned as librarians, a work activity which paid modestly at just over $13,000 for both bachelors and masters. Since fewer than 1% of Ph.D.s were so engaged, their median salary could not be calculated.

The literature chemist's specialty is also of interest in examining his economic status. Reinforcing other findings, those who identified their specialty as management were best paid of all. At the other end of the compensation spectrum, those doing literature and patents search work abstracting, or library functions are not particularly well paid, the survey found.

So far as geographic variation among salaries is concerned, there were insufficient participants to calculate medians in all U.S. census regions. Where figures could be developed, it seemed clear that literature chemists in the South Atlantic States did much better than the average at $19,000, $17,500, and $26,400 for the three degree levels, respectively. Also, it is pertinent to observe that the Middle Atlantic States of New Jersey, New York, and Pennsylvania accounted for a far larger proportion of the chemical literature group (40.4%) than is generally true for the profession (28.3%) (Table VI).

Table VII. Employment Status

	B.S.	M.S.	Ph.D.	Over-all
Full time employed	88.1%	87.1%	85.1%	86.8%
Part-time employed	1.8	4.9	5.0	4.0
Unemployed	3.6	3.1	2.5	3.1
Subprofessionally employed	0.6	0.9	0.0	0.5
Retired	4.1	1.8	6.2	3.8
No report	1.8	2.2	1.2	1.8
Over-all	30.3%	40.7%	29.0%	

EMPLOYMENT OUTLOOK

In the current recessive era, chemists understandably have a greater concern about job security and opportunities for new employment. Responding to this situation, ACS conducted a national survey earlier this year to elicit pertinent facts about the employment status of its members. Similar surveys also were conducted by the National Science Foundation and the American Institute of Chemical Engineers. All three organizations reported essentially the same findings, namely, that 3% of the chemical profession was unemployed.

The Division of Chemical Literature survey did not produce any significantly different data. Among those responding, 3.1% were unemployed, 86.6% were full-time employed, and 4.0% were employed part-time. Perhaps most encouraging was the observation that only 0.5% of the Division's members felt that they were subprofessionally employed, whereas 2.4% of all ACS members had placed themselves in this category (Table VII).

THE SURVEY

This survey was undertaken at the request of the officers of the Division of Chemical Literature and with the cooperation of the ACS staff Office of Professional Relations. Questionnaires were distributed to 940 U.S. members and affiliates of the Division in late July. By the September 1 deadline, 558 forms had been returned, a 59.4% response (national ACS response for 1971 was similar, 60.9%). Of these, 496 (89.4%) were from members, 45 (8.1%) were from affiliates, and the remainder did not indicate their Divisional status.

In the letter distributing questionnaires to members, the Division indicated the survey had two purposes. One was to promote the professional interests of its members. The second was to provide benchmarks for professional evaluation and private comparison, both within the chemical literature field and with chemists in other fields of specialization. It would appear that by virtue of members' participation in the survey and through observation of the resulting statistical data both purposes were accomplished.

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