

TAPPI survey of 1988 income

David T. Orr and Doug Burke

The most representative TAPPI member is a 40-year-old, college-educated male with 20 years of experience in the industry who manages a major department in a mill in the Southeast, earning between \$50,000 and \$60,000.

The twelfth annual TAPPI salary survey is based on responses to questionnaires mailed in January 1989 to 10,000 randomly selected members of TAPPI, representing roughly half of the membership. There were 3171 responses, so the response rate was about 1 in 3, the same as last year's. Most respondents work in the southeastern region, as Fig. 1 shows, with sizable numbers working in the midwestern, northeastern, and mid-Atlantic regions. Response from the northwestern and southwestern regions was unusually low. Key demographic statistics involving the type of employer, principal areas of involvement, and principal job functions are presented in Figs. 2-4, respectively.

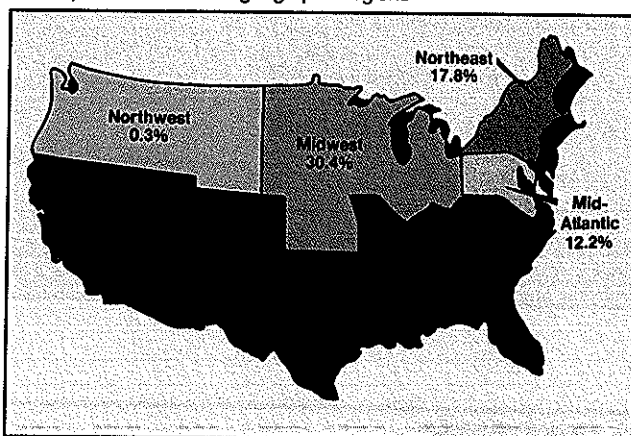
The survey shows that the most representative TAPPI member is a 40-year-old, college-educated male with 20 years of experience in the industry. This person works for a large company (sales >\$2 billion), lives in the Southeast, manages a major department, earns between \$50,000 and \$60,000, and received a salary increase of at least 5% last year.

A paradox of statistical analysis is that a typical profile may not represent any particular individual. While a few readers will come close to this profile, most will not. Consequently, we present here selected results of the survey so that each individual can apply the data to his or her unique circumstances. Readers who wish a copy of the complete survey results can obtain one by writing to TAPPI's Information Resources Center, P. O. Box 105113, Atlanta, Ga. 30348-5113.

Salaries increased by an average of 5%

Results from this survey covering salaries earned in 1988 show that the median income of U.S. TAPPI members was \$55,000, the same as last year. The median income is the income of Respondent No. 1586 when all 3171 respondents are listed in order from the one with the smallest salary to the one with the largest. While the median income remained the same, which could be meaningless, the average of all reported salaries was \$65,300, up 6.4% from

1. Response from the six geographic regions



last year's average of \$61,400.

The salary distribution in Fig. 5 shows how a preponderance of high values on the right-hand side of the scale skews the normal bell curve and inflates the mean. The average does not directly reflect the distribution's central tendency, therefore, and the median value is often taken as a more appropriate value for the typical salary.

Because both the mean and the median have shortcomings as measures of salary increases, we included a question this year asking respondents to report their increases in salary. The average of all reported increases was 7.4%, while the median salary increase was 5%.

Figure 6 shows the distribution of salary increases reported by TAPPI members. Once again, the curve is skewed to the right, making the median value of 5% a better indicator of the typical salary increase for 1988 than the mean value of 7.4%. The spikes at 0%, 5%, 10%, 15%, and 20% suggest a bias introduced by respondents in rounding off values to convenient numbers.

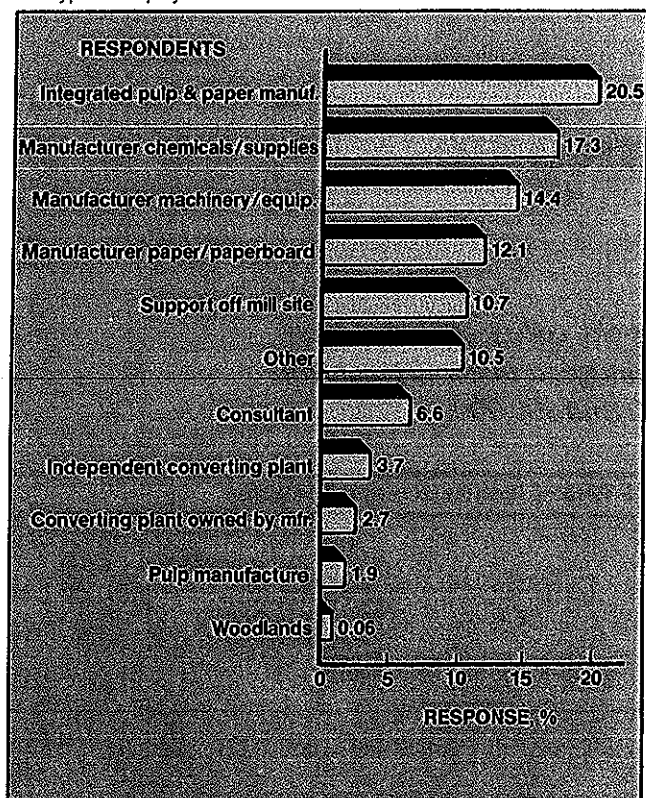
Factors affecting income

Level of responsibility

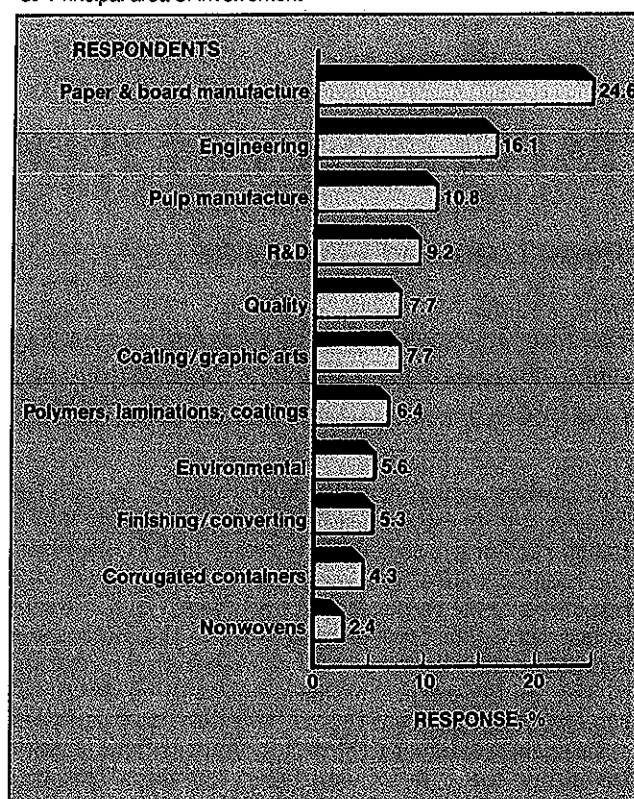
The data suggest that the variable with the greatest effect on individual income is the level of responsibility associated with a given work function. The survey classifies job responsibility into six categories, as given in Fig. 7, showing the median income range for each

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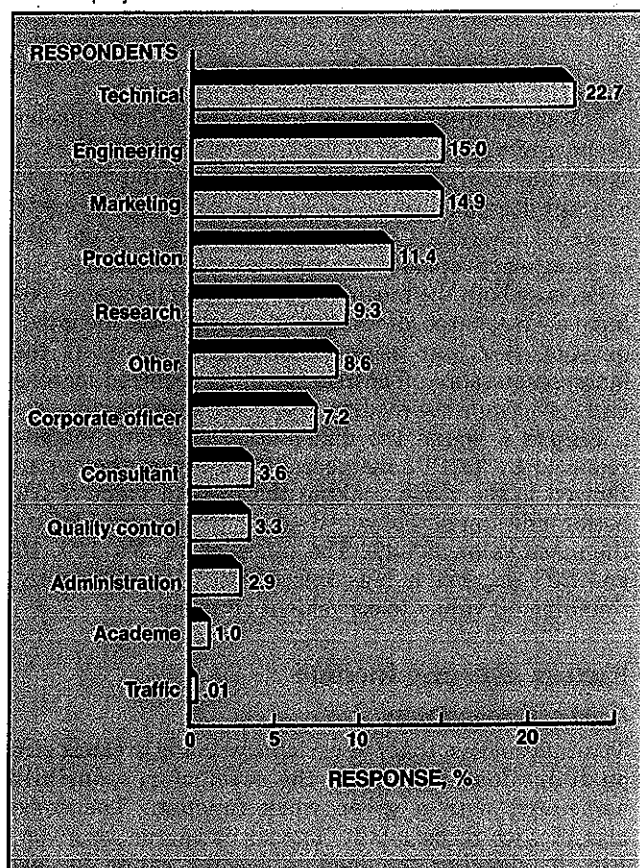
2. Type of employer



3. Principal area of involvement



4. Principal job function



category. The salary distributions within each category are presented in Fig. 8.

Not surprisingly, incomes increase with level of responsibility. What may be surprising to some is the magnitude of the increase at the higher levels of responsibility.

Level of experience

Another variable with a pronounced effect on personal income is an individual's experience in the industry. Figure 9 outlines income as a function of experience. The steady increase in salary with experience is no surprise.

What we found surprising was the parity between the salaries for new hires and for those with 1-6 years of experience. The cumulative distribution of salaries in Fig. 10 shows little difference between the curve for new hires and the curve for members who have worked for 1-3 years. The curve for 4-6 years is higher than these two curves, but salary does not appear to improve substantially with experience until you have been working in the industry for 7 years. In other words, experience is valued but is slowly proven.

Education

Most of the respondents, 89%, have earned at least a B.A. or B.S. degree. Figure 11 shows the highest level of education obtained by the survey respondents. The cumulative distribution of salaries by level of education is presented in Fig. 12. The median income for college graduates and those without a college education is the same, about \$50,000. The median income for those with a master's degree is about \$4000 higher, while the median

I. Distribution of income in 11 industry sectors, %

Sector	Salary range, \$1000				
	<30	30-49	50-69	70-100	>100
Paper & board	2.5	32.5	31.9	18.9	14.2
Pulp manufacture	1.2	33.2	36.0	20.7	8.8
Finishing/converting	1.9	29.8	34.2	21.7	12.4
Coating/graphic arts	1.7	30.3	40.6	17.1	10.3
Process/product quality	5.5	50.9	25.4	11.9	6.4
Environmental	5.3	32.6	33.7	18.9	9.5
Engineering	0.6	32.1	38.0	20.5	8.8
Corrugated containers	3.8	22.7	34.9	19.7	18.9
Polymers, laminations, and coatings	3.6	29.7	30.3	19.0	17.4
Nonwovens	1.4	28.8	30.1	31.5	8.2
Research & development	10.0	34.9	31.0	15.3	8.9

for those with a Ph.D. is about \$62,000.

We did not correlate education and level of experience. However, we suspect that those without a college education are able to achieve parity with college graduates only after gaining substantial experience. The high salaries for new hires seems to corroborate this conclusion.

Geographic location

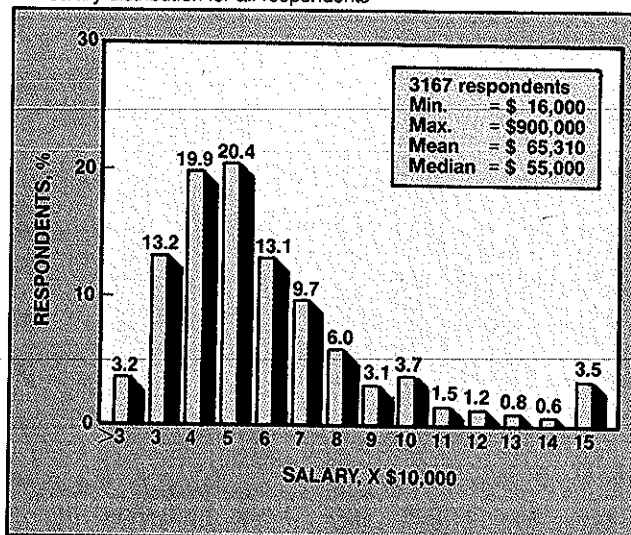
On the surface, geographic location is not a significant factor in determining individual income. Returns from the northwestern and southwestern regions were too small to draw any conclusions (Fig. 2). The median income for each of the other four regions was between \$50,000 and \$60,000. The distribution by geographic location reminds us where the jobs are, however, and a willingness to relocate may be the most important factor in determining an individual's income.

Sector of the industry

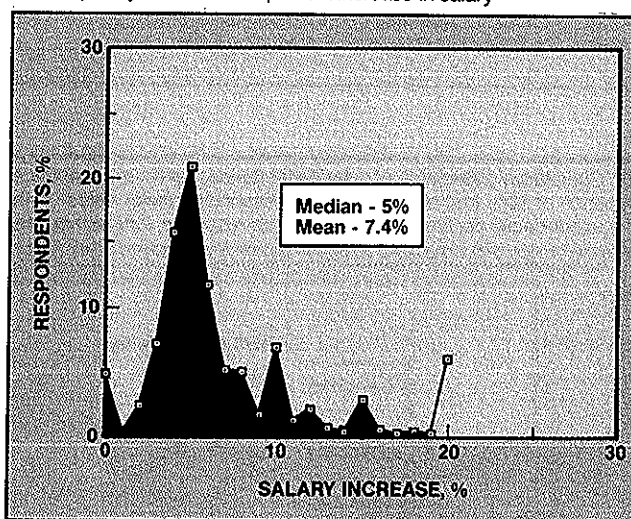
The income distribution for each of 11 industry sectors is given in Table I. The distribution profiles for each sector are fairly similar, with some notable exceptions:

- R&D had the largest percentage of people making less than \$30,000.
- Most of those working in product and process quality make less than the industry's median income of \$55,000.
- The packaging sectors had the highest percentage of people with incomes greater than \$100,000. Corrugated containers led the way, followed closely by polymers, laminations and coatings.

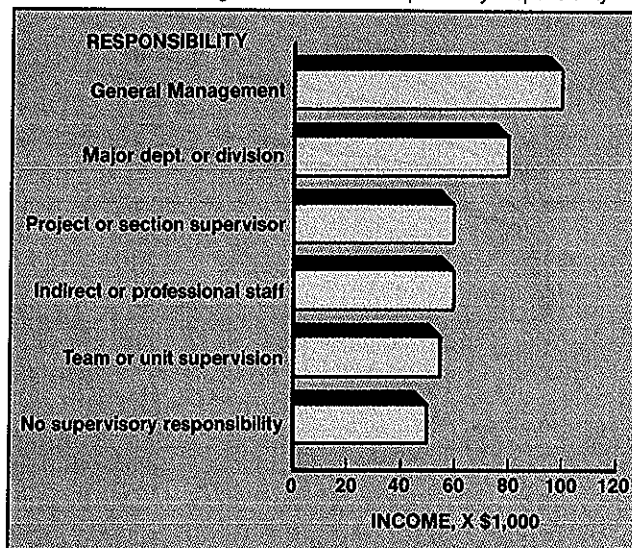
5. Salary distribution for all respondents



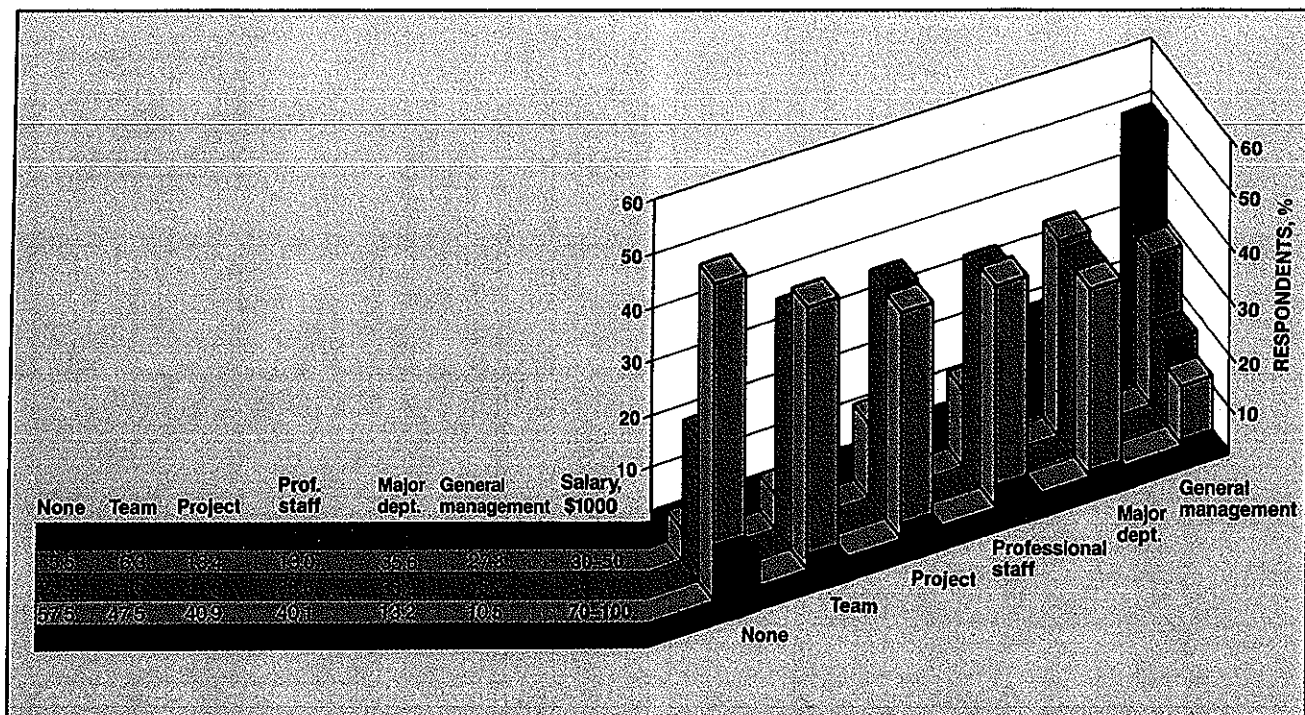
6. Frequency distribution of percent increase in salary



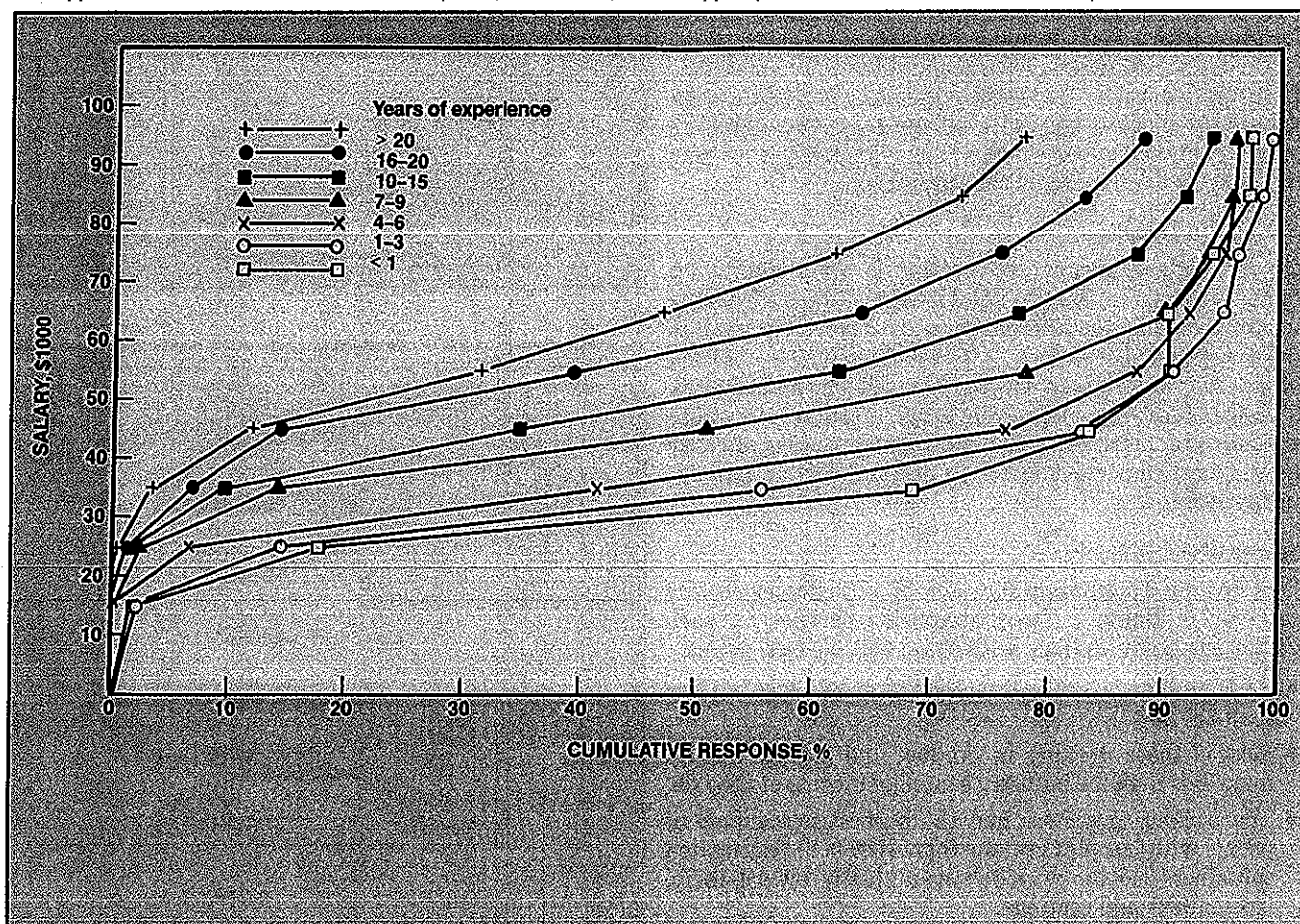
7. Median income range as a function of supervisory responsibility



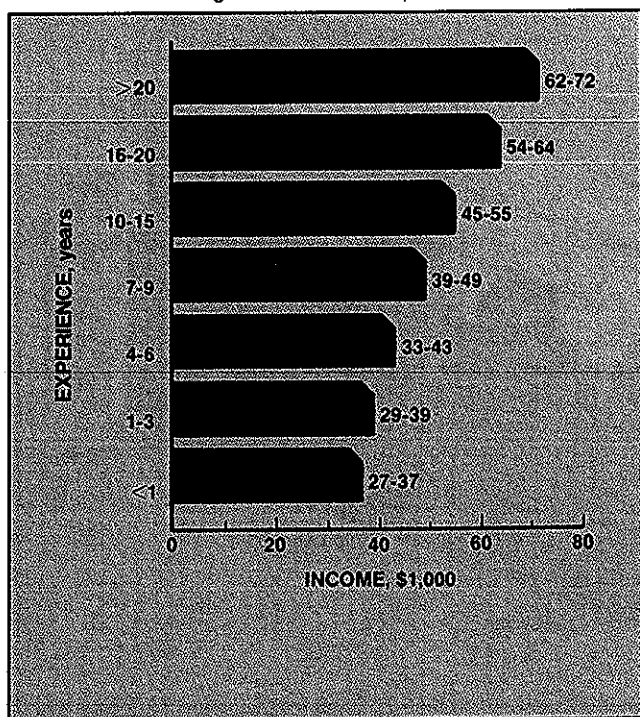
8. Salary distribution at various levels of supervisory responsibility



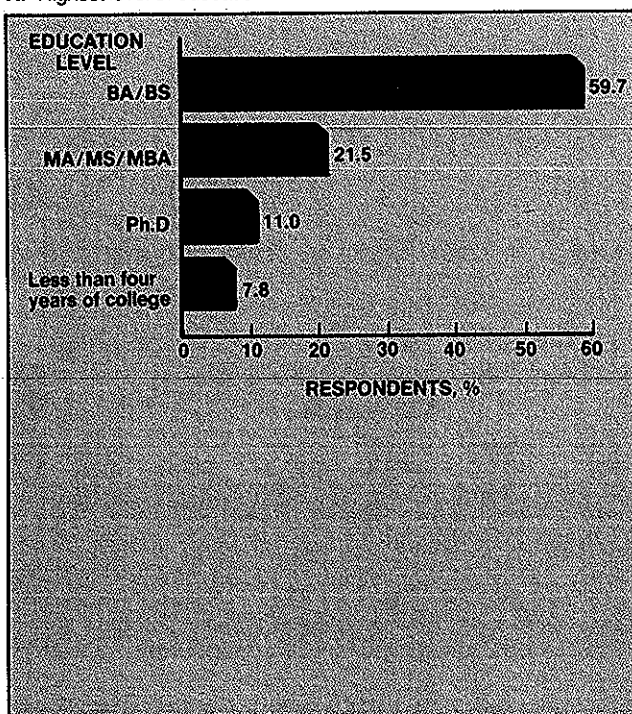
10. Cumulative distribution of salaries for various levels of experience. The median salary for a given curve is obtained by finding the cumulative response of 50% and obtaining the corresponding dollar value on the vertical axis. Values for any quartile can be obtained in similar fashion. The upper decile occurs at 90% cumulative response, for instance, and the upper quartile occurs at 75% cumulative response.



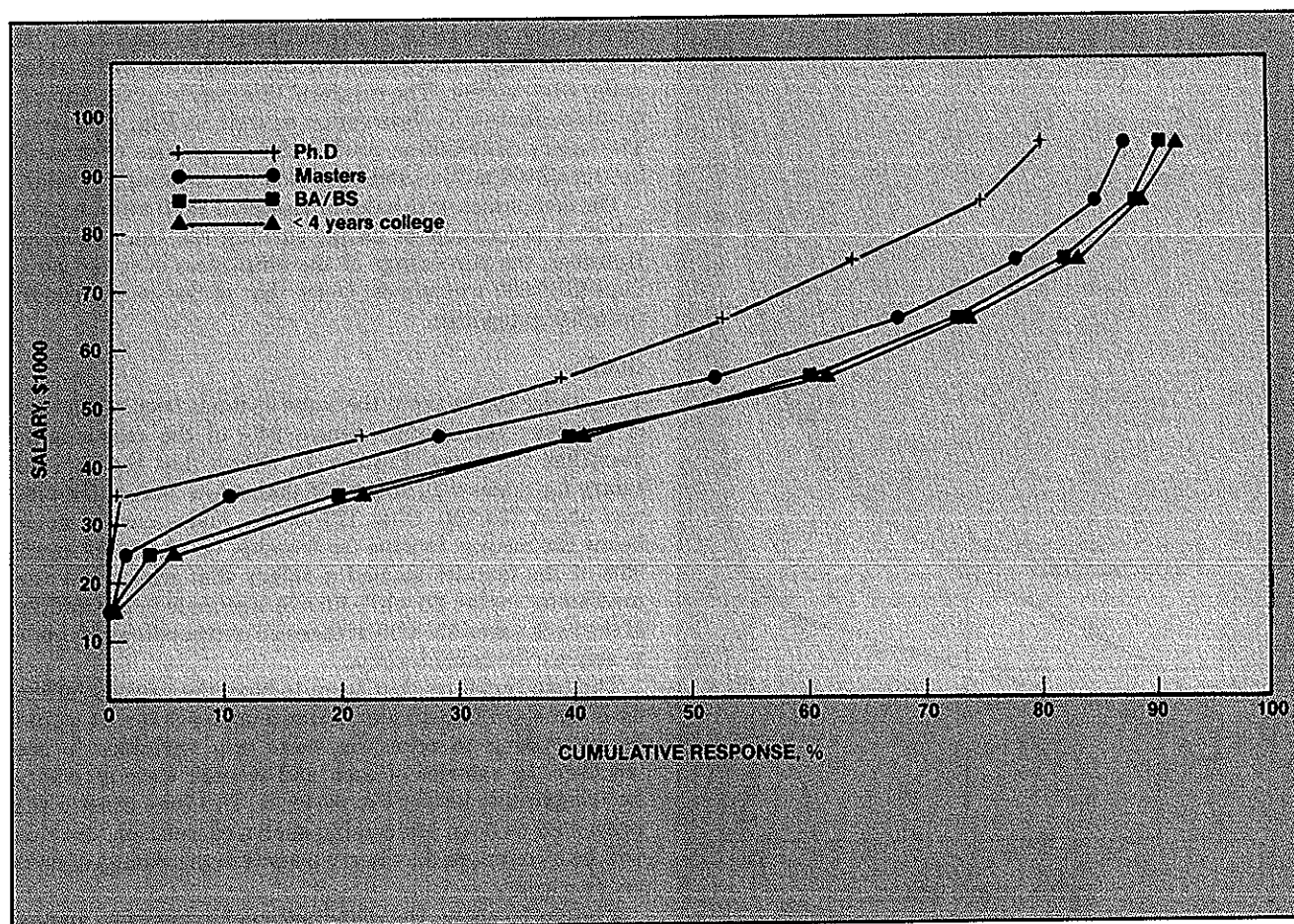
9. Median income range as a function of experience



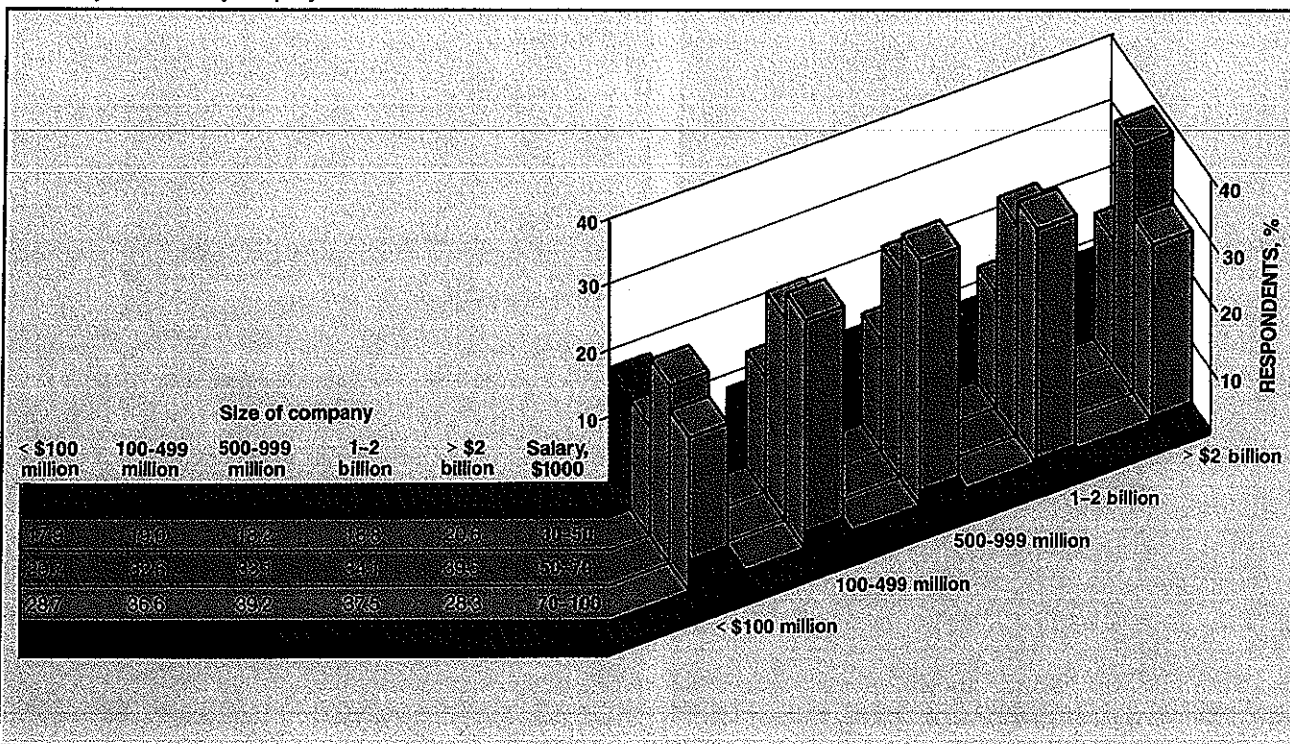
11. Highest level of education



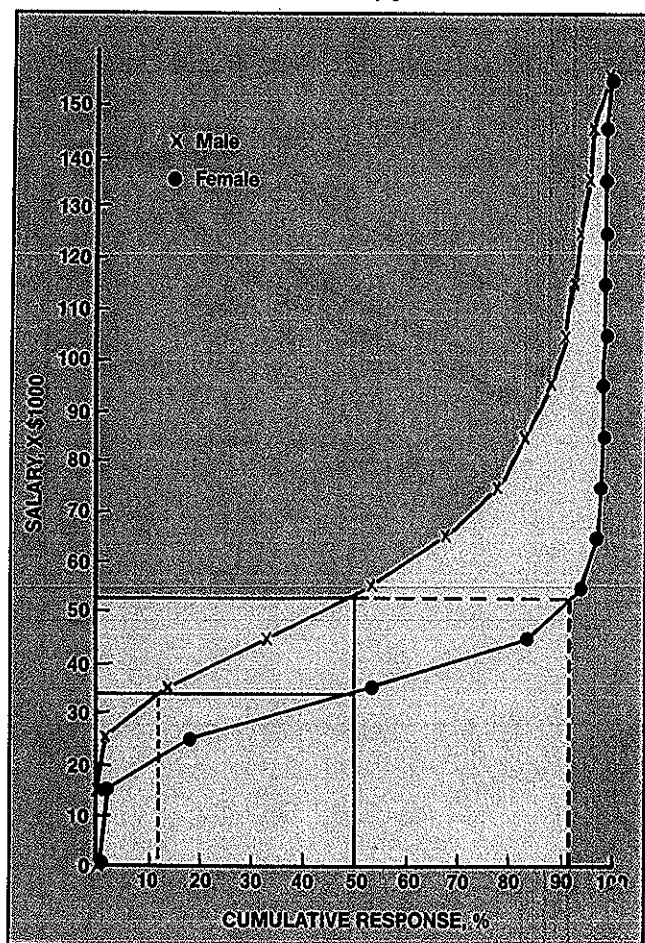
12. Cumulative distribution of salaries by level of education



13. Salary distribution by company size



14. Cumulative distribution of salaries by gender



Size of the company

Results from the previous two surveys suggest that the distribution of salaries is not influenced by the size of the company—with the exception of companies with sales under \$100 million. The results of this year's survey appear to substantiate this observation as well, as Fig. 13 shows. The salary distribution profiles for companies with sales between \$100 million and \$2 billion are strikingly similar.

The companies with sales of less than \$100 million have a higher percentage of people earning less than \$30,000. However, the percentage of the employees earning more than \$100,000 was almost twice that of the companies in the other categories.

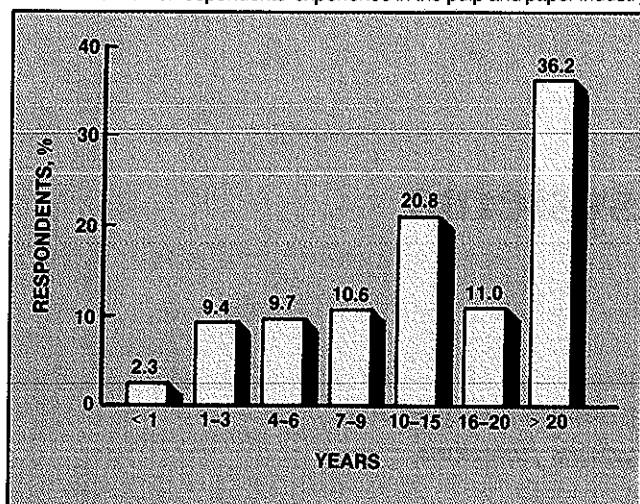
Gender

The gender gap is about the same as it has been in surveys of previous years, with almost 94% of the respondents identified as males. Figure 14 shows that the median salary for males was about \$55,000, while that of females was about \$34,000. Only 12% of the males earned at or below the median income for females. On the other hand, 93% of the females earned a salary that was below the median for males. So while an average male in the middle of the pack earns \$55,000, it takes an extraordinary female to achieve the same income.

The two variables that seem to have the greatest effect on income are industry experience and gender. It would be interesting to correlate these two variables to see whether the salaries of men and women were at parity for comparable levels of experience. Deadline constraints prevented us from attempting such a correlation, but this will be on our agenda when we analyze the results of next year's survey.

Figure 15 shows the distribution of experience among

15. Distribution of respondents' experience in the pulp and paper industry



all respondents. This distribution is skewed heavily to the right by members with experience of 20 or more years. We suspect that most of the people in this category are males with incomes that are much higher than average. If this is true, then the disparity between male and female salaries may be largely a function of the length of service rather than gender-based distinctions. □

TAPPI extends its gratitude to everyone who took the time to respond to the survey.

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