# The Earnings of American Men of Science

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INFORMATION ON THE EARNINGS OF SCIENTISTS included in the 1949 edition of the biographical directory *American Men of Science*[1] is most useful for the light it throws on the professional earnings of Ph.D.s and the major factors that influence their salary levels. The survey covered a large proportion of all the Ph.D.s in the natural sciences,[2] and a small proportion of non-Ph.D.s—presumably those equal to the Ph.D.s in scientific achievement.

The fact that American Men of Science with bachelor's degrees only were a highly selected group is reflected in their salaries. Their median regular annual salary was $6,450 a year at the time of the survey (in mid-1948), as compared with $5,720 a year for Ph.D.s and $5,610 a year for scientists holding master's degrees.[3] Close to half the bachelors were employed in private industry, where salaries are relatively high, whereas colleges and universities were the largest employers of Ph.D.s. Over half the American Men of Science with Ph.D.s were working at least part-time for educational institutions, and 44 per cent had no other regular employment. In many specialties, the proportion working exclusively for colleges and universities was considerably above this over-all figure (Table 1).

TABLE 1

PROPORTION OF PH.D. SCIENTISTS WORKING FOR SPECIFIED TYPES OF EMPLOYERS, BY FIELD OF SPECIALIZATION

| Field of specialization | Total reporting | Education | Government | Education and government | Private industry | Foundation | Independent consultant | Education and independent consultant | Other |
|---|---|---|---|---|---|---|---|---|---|
| Total reporting | 100.0 | 44.2 | 10.9 | 2.5 | 26.5 | 1.8 | 1.1 | 7.8 | 5.2 |
| Chemistry | 100.0 | 30.2 | 7.0 | .8 | 49.1 | 2.1 | .8 | 6.0 | 4.0 |
| Engineering | 100.0 | 20.1 | 7.7 | 1.2 | 43.6 | .9 | 4.0 | 15.6 | 6.9 |
| Physics and electronics | 100.0 | 46.7 | 11.0 | 1.6 | 22.9 | 1.0 | .8 | 11.4 | 4.6 |
| Earth sciences | 100.0 | 37.1 | 17.5 | 5.4 | 14.2 | 1.0 | 3.8 | 13.8 | 7.2 |
| Agriculture | 100.0 | 49.6 | 23.5 | 9.0 | 9.0 | .6 | .7 | 5.2 | 2.4 |
| Biology | 100.0 | 60.0 | 16.1 | 4.7 | 9.0 | 2.4 | .5 | 4.1 | 3.2 |
| Medicine | 100.0 | 31.3 | 20.0 | 3.1 | 8.2 | 3.1 | 2.5 | 10.8 | 21.0 |
| Fields related to medicine | 100.0 | 70.1 | 6.8 | 1.1 | 10.4 | 2.2 | .2 | 5.5 | 3.7 |
| Mathematics and statistics | 100.0 | 75.6 | 7.2 | 1.5 | 4.6 | .3 | .6 | 7.4 | 2.8 |
| Psychology | 100.0 | 55.1 | 6.3 | 3.1 | 4.0 | 1.1 | .7 | 11.7 | 18.0 |
| Other | 100.0 | 37.2 | 12.9 | 1.8 | 28.2 | 3.1 | 1.1 | 9.2 | 6.5 |

Engineering offered the most notable exception to the predominance of university employment among Ph.D.s. Twice as many engineers with doctorates were working for business firms as for educational institutions. Chemistry likewise had a large proportion of Ph.D. scientists (49 per cent) in industrial employ-

[1] The survey for the 1949 edition of *American Men of Science* was conducted jointly by the National Academy of Sciences–National Research Council and the publishers of the directory. Funds and assistance were provided by the Department of Defense, through the Office of Naval Research. The questionnaires were tabulated and analyzed by the Bureau of Labor Statistics under contract with the Manpower Branch, Human Resources Division, Office of Naval Research, acting for the Department of Defense. A detailed statistical report on the fields of specialization, education, employment, and earnings of scientists in *American Men of Science* has been prepared by the Bureau of Labor Statistics, and will be published in the near future. A description of the manpower research program of the Office of Naval Research can be found in SCIENCE (**112**, 133 [1950]).

[2] As was indicated in SCIENCE (**112**, 265 [1950]), about 75 per cent of the people granted Ph.D. degrees in the natural sciences (including psychology and geography) between 1936 and 1946, and 81 per cent of those who received their doctorates in 1946–47 were included in the directory. The statistical report covers only 41,737 of the 52,600 names listed in the directory; hence, the coverage of the report is lower than that indicated by the above percentages.

[3] Regular annual salaries were reported by 82 per cent of all scientists covered by the analysis, and by 85 per cent of the Ph.D.s. Close to 40 per cent of the latter also indicated some additional professional earnings. Income information was obtained by means of check lists of income brackets. For annual salaries, the brackets began at "under $2,000 a year" and ranged up to "$10,000 or over," each intermediate bracket having a spread of $1,000.

ment. In the entire group of scientists, however, only one out of every four Ph.D.s was in private industry; only about one out of every ten worked exclusively for a government agency; and still smaller proportions worked for nonprofit foundations or were self-employed.

The median salary for all the Ph.D.s reflects in great measure both the predominance of educational employment and the relatively low salaries received by faculty members. The middle salary of the group employed exclusively in education was $4,860 a year, in contrast to a median salary of $7,070 a year in industry. Salary levels in government, although below those prevailing in industry, were also considerably above those prevailing on the campus, the median salary for Ph.D.s in government employment being $6,280 a year. The small group of scientists working for nonprofit foundations and institutes earned about the same amount as government employees. If all the educators, including those who had other work as well, had been combined into one category, the middle salary in education would have been somewhat higher. The median salary of those employed by both government agencies and educational institutions was $5,710 a year, and those who combined educational employment and consultation had a median salary of $5,570.

The tendency toward higher salaries in private industry holds true for every specialty. Even for the one exception shown in Table 2, physics and electronics, a comparison of parallel age groups shows that scientists in industry received the highest median salary in every instance. Even the lowest-paid scientists in private industry, the biologists, tended to fare better than the highest-paid of all the educators, the engineers.

TABLE 2

MEDIAN AGES AND MEDIAN SALARIES OF THE PH.D.S IN EACH SPECIALTY BY TYPE OF EMPLOYER

| Field of specialization | Scientists employed solely in: Education | | Government | | Industry | |
|---|---|---|---|---|---|---|
| | Median age* | Median salary | Median age* | Median salary | Median age* | Median salary |
| Total reporting | 42 | $4,860 | 42 | $6,280 | 38 | $7,070 |
| Chemistry | 39 | $4,670 | 41 | $6,290 | 37 | $6,880 |
| Engineering | 42 | 5,700 | 42 | 7,400 | 39 | 8,000 |
| Physics and electronics | 42 | 5,040 | 41 | 7,400 | 38 | 7,350 |
| Earth sciences | 45 | 5,200 | 42 | 6,120 | 42 | 7,780 |
| Agriculture | 43 | 5,390 | 45 | 5,980 | 42 | 6,670 |
| Biology | 42 | 4,610 | 43 | 5,480 | 40 | 6,250 |
| Fields related to medicine | 42 | 5,060 | 42 | 5,930 | 39 | 6,850 |
| Mathematics and statistics | 44 | 4,760 | 41 | 6,830 | 40 | 7,350 |
| Psychology | 44 | 4,920 | 42 | 6,180 | 40 | 7,940 |

* These median age figures refer only to the scientists who reported salary.

TABLE 3

MEDIAN SALARIES OF PH.D. SCIENTISTS, BY TYPE OF EMPLOYER AND REGION OF EMPLOYMENT

| Region of employment | All scientists* | Scientists employed solely in: Educational institutions | Private industry | Government |
|---|---|---|---|---|
| Total reporting | $5,720 | $4,860 | $7,070 | $6,280 |
| New England | $5,380 | $4,730 | $6,590 | $5,410 |
| Middle Atlantic | 6,310 | 4,930 | 7,320 | 6,730 |
| South | 5,200 | 4,700 | 7,240 | 5,660 |
| North Central | 5,730 | 5,070 | 6,940 | 5,750 |
| Mountain and Plain | 4,940 | 4,620 | 6,500 | 5,810 |
| Pacific | 5,550 | 4,940 | 6,630 | 6,050 |

* Includes scientists working for all types of employers and all combinations of types.

There were differences in salary levels also between one specialty and another, whatever the type of employer. Engineers generally earned more than their fellow-specialists, both on the campus and off it, whereas biologists tended to fall at the bottom of the salary scale in every type of employment. Length of experience as evidenced by age undoubtedly plays a part in these salary differentials. Even more influential appears to be the dominant source of employment in the field. Engineers are in such great demand in private industry that universities must make some concession to the higher levels of pay of business firms if they are to attract and hold these specialists. In biology, on the other hand, the leaven of industrial competition is too slight to affect college salaries.

Salary differentials among types of employers, however, far outweighed regional differentials in salary levels. In every section of the country scientists employed exclusively in educational institutions tended to earn considerably less than those employed in government agencies, who in turn averaged somewhat less than the group working for business firms. Moreover, the highest median salary received by educators in any region was well below the lowest median regional salary received by scientists in government or in industry (Table 3).

The monetary advantages enjoyed by scientists in private industry appear even greater when age is taken into account. Despite their higher median earnings, the Ph.D.s in business firms tended to be younger than their fellow-specialists employed elsewhere. As would be expected, the older men normally received higher salaries than their younger colleagues, whatever the type of employment. But median salaries tended to increase more rapidly with age in private industry than in any other type of employment. Middle salaries among the men under thirty were not too far apart as between one type of employment and another. Scientists in this age group who reported

only one type of employment had a median *annual* salary of $3,900 in education, $5,050 in government, and $5,560 in private industry. In the fifty–to–fifty-four–year age group, however, the differential was great, the median salary being $9,980 in private industry as contrasted with $6,800 in government and $5,460 in educational institutions (Fig. 1).

Since the scientists in this survey were not asked to indicate their exact salaries if these reached or exceeded $10,000 a year, this report cannot compare the highest salaries among the various types of employment. What the study does show is an enormous difference in the proportion receiving $10,000 or more

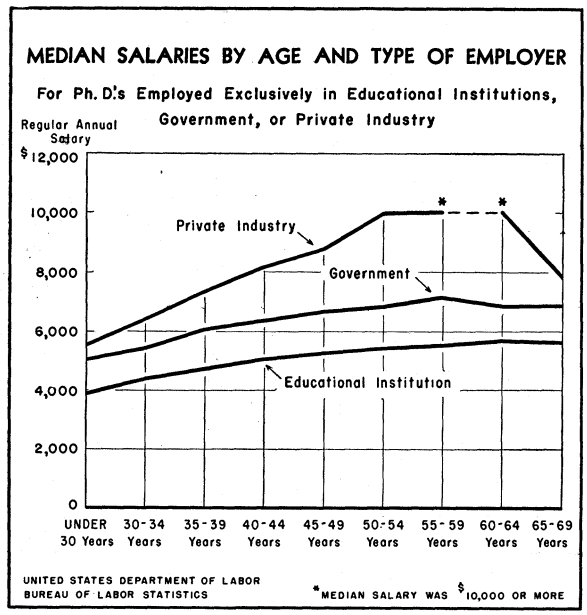


FIG. 1.

a year in private industry as compared with either government or educational employment. In private business 47 per cent of the scientists between forty-five and sixty-five earned $10,000 or more a year as opposed to 7 per cent of those in government and 4 per cent of the educators of comparable age.

Although the highest-paid scientists were found in private industry, the range of salaries was much wider in this type of employment than in either education or government, and some industrial scientists were no better off financially than their colleagues in government or education. By and large, however, the lower-paid scientists in private industry made more than the lower-paid ones in any other kind of employment. Salaries under $5,000 were reported by only 5 per cent of the Ph.D. scientists between fifty and sixty-five in industry, but by 11 per cent of those in government, and by 36 per cent of the educators.

A comparison of the annual salaries of educators

TABLE 4

ADDED PROFESSIONAL INCOME AND MEDIAN REGULAR SALARY OF PH.D.S WORKING FOR SPECIFIED TYPE OF EMPLOYERS

| Type of employer | Median regular salary | Added income | |
|---|---|---|---|
| | | Percentage reporting* | Median |
| Educational institution | $4,860 | 43.9 | $ 810 |
| Private industry | 7,070 | 13.9 | 750 |
| Government | 6,280 | 12.2 | † |
| Foundation | 6,070 | 17.8 | 520 |
| Educational institution and independent consultant | 5,570 | 92.2 | 1,260 |
| Educational institution and government | 5,710 | 44.9 | 970 |
| Educational institution and private industry | 6,170 | 78.2 | 1,140 |
| Independent consultant and government | 6,720 | 89.6 | 710 |
| Independent consultant, government, and educational institution | 5,530 | 94.1 | 1,480 |
| Independent consultant and private industry | 7,710 | 84.1 | 1,060 |

* Percentages are based only on scientists reporting regular salary.
† Less than $500.

with those of scientists elsewhere employed must also take into account the fact that most faculty members have a nine-month year. Many people think that educators can, therefore, augment their regular salaries by such subsidiary employment as summer-school teaching and consulting to a much greater extent than is possible for scientists in government and in industry.

This supposition held true to some extent among American Men of Science. A much larger proportion of educators than of other scientists did supplement their salaries by earnings from other sources, though the extra income by no means made up for the difference in salary levels between education and other employment. Secondary professional income made only a slight contribution to the total incomes of either government employees or scientists working for business firms. Less than 15 per cent of the Ph.D. scientists in either category had earnings in addition to their salary, but nearly half the faculty members (44 per cent) had extra incomes. How little supplementary income compensated for the lower salary levels in education is seen in Table 4. For some people, earnings from consultation, teaching, or writing made a real contribution to the family budget. For the group of educators as a whole, however, even considering the dual job-holders along with the others, total professional income apparently tended to be well below the total income of scientists working in industry or government.