

Employment Problems of Young Physicists

By *M. Stanley Livingston*

INFORMATION on the present attitudes of young scientists toward their prospective employment is useful in assessing the effects of graduate training, in evaluating the motivations of students, in aiding placement offices to find suitable jobs for graduates, and in many other ways. The increasing demand for scientists in our growing industrial system and in government defense laboratories requires accurate estimates of the supply of young scientists and of how they are being assimilated. Considerable evidence has been presented to show that the numbers now being trained are insufficient to meet future needs. A new problem has arisen in recent years, concerning the security status of scientists. It is of interest to know, for example, whether the unpleasant publicity given to several prominent security clearance cases has had a significant effect on the willingness of young scientists to accept employment which requires security clearance.

In an attempt to obtain information about such em-

ployment problems, a questionnaire has been prepared and distributed to about 100 terminal graduate students in physics in several of the larger academic institutions. The questionnaire was prepared with the assistance of members of the physics, medical, and psychology departments at MIT and was sent to about 15 universities, requesting their cooperation. Replies including statistical summaries of the returns have been received to date from only 3 institutions. However, they are representative of the large academic research institutions and span the country from coast to coast. The questionnaires were anonymous, and the institutions supplying the information will also be. Returns were received from 61 students, and the results are presented in the accompanying Table.

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Table I. Results of a Questionnaire to Physics Graduate Students (percentage figures, based on 61 returns)

- (1) Have you already accepted a position?
yes—30; no—70
- (2) In interviews with employer's representatives would you prefer scientific personnel to do the interviewing rather than employment officers?
yes—85; no—7; no opinion—8
- (3) In choosing a position, how much importance do you place on whether it continues deferment of your military service?
major—12; minor—9; none—79
- (4) Do you prefer a position principally involving:
teaching—13; research—84; engineering applications—3
- (5) If your interests are in research, in which type of laboratory:
academic—57; industrial—35; government—8
- (6) Rank in order of importance those factors which influence your choice of a position (1st choice).
salary—3; security clearance—6; choice of work—70; prospects for the future—16; other—5
- (7) If you had a completely free choice would you prefer to:
 - (a) work by yourself on research of your own choice? —15
 - (b) work under an outstanding research scientist? —22
 - (c) operate a private business or consulting agency? —5
 - (d) direct a laboratory applying science to human needs? —5
 - (e) work with others as a member of a research team? —20
 - (f) combine teaching with a research activity? —33
- (8) Have you any reservations in applying for or accepting a position requiring security clearance?
yes—46; no—54
- (9) Would you accept a somewhat lower salary in a position not requiring security clearance?
yes—45; no—35; no opinion—20
- (10) Has your attitude regarding security clearance undergone any change in the past six months?
yes—30; no—65; no comment—5

THE number of returns (61) is small, yet it represents about 15 percent of the annual crop of PhD's in physics. The sampling covers only a few of the larger research institutions, and so is representative of the attitudes developed within relatively large student groups. The dates of the survey (May–September 1954) cover a period when there was considerable press coverage and discussion of the Oppenheimer security case, which has obviously affected some replies and may be transitory in its significance. Nevertheless, the results are qualitatively significant and expose a situation which has not previously been documented by statistical evidence.

We observe that 70 percent of the respondents had not yet accepted a position. Possibly when faced with the practical choice of salary and job security many will make decisions which do not fully match their hopes. Employers should be interested in the predominant choice of scientific personnel for job interviews, as shown by the answers to (2). We also note that military deferment is a problem to only a small fraction of students, possibly because many have already served their tour of duty in the services.

Answers to questions (4) to (7) show an expected strong interest in basic research and an understandable affection for the ideal combination of university teaching and research. However, the small number of such opportunities cannot accommodate more than a fraction of the students indicating such a preference, and many will of necessity accept other employment. The interest in government laboratories shown by (5) is abnormally low, and does not seem to agree with the considerably larger number accepting such jobs; the returns may reflect the effects of the security clearance problem. In the answers to (7) we observe that a majority desire continuing guidance or collaboration; few feel competent to direct their own efforts at this early stage in their careers.

The answers to questions (8), (9), and (10) show that the security clearance problem is real. They indicate a distrust of security procedures, and an urge to avoid involvement, for nearly half of these young scientists. About 30 percent have formed these opinions within the past 6 months, showing the effect of recent events. We can be confident that this does not represent any concern about their own clearability. And when the need arises, such as a national emergency, these young scientists will join in defense work and do their bit; of this we can be sure. Furthermore, the choice of salary and the urge for job security will force many who prefer not to become involved to go through security clearance procedures. Still it is clear that abuses of the security system have alienated the sympathies of young scientists to a significant extent.

Although these returns are fragmentary, they cast some light on several problems which have been much in the minds of thoughtful analysts of trends in science. Further evidence would be of real value, and also alternative interpretations of the significance of the results.

Miscellany

Bolling Resolution

A Joint Congressional Committee on the Economics of Atomic Defense was proposed in the House of Representatives on February 7th in a Concurrent Resolution (H. Con. Res. 66) introduced by Representative Richard Bolling of Missouri. The resolution, which has been sent to the House Rules Committee, is designed "to bring before the Congress and the American people the best judgments of scientists, lay readers, and congressional experts" on the effect of the H-bomb on existing concentrations of population and industry, the possibilities for defense, and the case for industrial dispersion and urban decentralization, including a full review of the many complicating factors that would be involved in such action. Membership of the proposed committee would be drawn from the Joint Committee on Atomic Energy and the Joint Committee on the Economic Report. According to the terms of the Bolling resolution, the committee would have the specific function of conducting a series of studies to establish and examine the relevant facts and to communicate the results of those studies to its parent committees and to Congress by the first of next year.

Education

The 1955 Summer Session at MIT will consist of 31 courses on a wide variety of subjects, including weather radar, parachute technology, ionizing radiations for industrial processing, numerical analysis, numerical weather prediction, technique of infrared spectroscopy, noise in electron devices, applications of infrared spectroscopy, low-temperature engineering and research, and noise reduction. There will also be a special program for science teachers. Detailed information may be obtained from the Summer Session Office, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Massachusetts.

A cooperative effort between Wayne University and a number of business and industrial concerns has resulted in a program of four special summer courses in the field of computing. Scheduled to take place from June 6th through July 2nd, the areas covered are: electronic computers, business and engineering applications; automatic data processing; mathematical programming of management problems; and numerical methods and advanced programming techniques. "Foremost experts in the respective fields" as well as the