

RATING GRADUATE SCHOOLS

AN ASSESSMENT OF QUALITY IN GRADUATE EDUCATION. By Allan M. Cartter, 131 pp. American Council on Education, Washington, D.C., 1966. Paper \$3.00.

by Ralph A. Sawyer

This book contains ratings made in 1964 of the relative quality of the graduate faculties and of the effectiveness of the graduate programs offered in 1663 departments in 29 fields of study in 106 schools. The fields include all the usual engineering, and literature, science, and arts departments; the schools include the 100 charter members of the Council of Graduate Schools plus six others that gave at least 100 doctorates in at least three fields in the past ten years. These schools together give more than 95% of all earned doctorates in the United States. The rating was done through questionnaires answered by 4000 scholars, including 900 department chairmen, 1700 senior scholars and 1400 junior scholars.

This study far exceeds in number of schools considered, in range of departments covered and in number of raters the three previous surveys of graduate schools. The surveys by President Hughes of Miami University in 1924 and 1934 covered 38 and 59 institutions respectively; that by Hayward Keniston for the University of Pennsylvania only the top 25 schools of the Association of American Universities. In these earlier surveys the number of raters was much smaller than in the present case where in only seven small fields were there less than 100 usable responses to the rating questionnaires. In spite of the span of 40 years covered by these surveys and of greater inclusiveness in schools and raters in the current survey, it is dominated like the earlier ones by virtually the same group of about twenty schools from the east, the far west, and the Big Ten plus Chicago. Schools like Johns

Hopkins, Duke, and North Carolina appear frequently and others occasionally and there are a few instances where an isolated strong department, such as anthropology at Arizona, chemical engineering at Delaware and geography at Louisiana State University, appears in the top categories of distinguished or strong departments. No southern or District of Columbia university shows notable strength although Cartter points out that 14 schools in the south have "the potential for achieving major national status in the years ahead."

Of the five major areas of study (humanities, social sciences, biological sciences, physical sciences and engineering) Harvard was rated first in all but engineering, California at Berkeley second in all five, Stanford was rated distinguished in four areas, and Cal Tech, Columbia, Illinois, Michigan, Princeton and Yale in three. The ratings are necessarily subjective but agreement on the high-ranking departments was extremely good. For the ratings on a scale of five the mean difference between over-

all scores and scores of the three subgroups of raters for 10 large departments was ± 0.082 . The ratings of the chairmen showed a larger mean difference than those of the junior scholars or of the senior scholars, who showed the smallest variation. For two of the three groups of raters physics showed the smallest variation of any of the 10 fields.

In physics, of 250 forms sent out, 190 usable replies were returned rating 86 institutions that reported one or more doctorates in the period 1952-1962. Nine departments, headed by California at Berkeley and Cal Tech, were rated distinguished and 12 strong. Only for the ninth school was there a difference among the three groups of raters. Seventeen departments were rated good and 11 adequate plus. The remaining 37 unnamed departments were considered marginal or inadequate.

On effectiveness of program, eight departments, led by Princeton and Cal Tech were rated extremely attractive, 11 attractive, and 29 acceptable plus. The order in the top cate-





gory was considerably changed from that of the quality ratings; Columbia dropped into the second, attractive, category.

Physics was one of four fields chosen for special analysis of the replies and for a comparison rating by a special panel—in physics of 15 experts nominated by the American Institute of Physics. The select panel agreed with the other respondents on the top 10 departments as well as on the second ten, but with some difference in order in each group. The top ten departments in the rating by all respondents for quality were: California (Berkeley), Cal Tech, Harvard, Princeton, Stanford, MIT, Columbia, Illinois, Cornell and Chicago; the second ten were: Yale, Wisconsin, Michigan, Rochester, Pennsylvania, Maryland, Minnesota, Washington (Seattle), Johns Hopkins and UCLA.

The results for effectiveness of program of the comparison between the select panel and the other rating groups was similar to those for quality. Analysis of the results in physics for effect of rater's degree school, institutional affiliation, current region of location and position of current school affiliation in the rating scale showed suprisingly little variation except for the rating by respondents from schools in the bottom half of the scale.

Physicists will probably not be surprised to learn that there is general agreement on the quality and effectiveness of the programs offered by

different institutions. The hierarchy, or pecking order, has long been clear from other evidence. The present study, however, will no doubt be used, and effectively, by schools below the top few to reinforce their appeals to administrations, legislatures and alumni for funds and help to improve their positions. Those whose position has declined markedly since the earlier surveys will be especially urgent while the schools which have demonstrated marked improvement will call for continued growth.

The American Council on Education has indicated its intention to repeat the survey within five years. At least two current federal policies may result in more changes in rank order of excellence than has occurred in recent years. In the past two years the National Science Foundation has made 13 grants totalling \$47 million to institutions considered able to move up into positions of excellence in scientific fields. This program is continuing and seems certain to alter the ranking in some fields. The second policy change occurred when, on 13 Sept. 1965, President Johnson directed all federal agencies to spend more of their money earmarked for institutions on more schools in more places. This program has barely begun to be felt, but in the past the top 15 universities in the present ranking have been receiving at least 50% of the federal research and fellowship support. Any marked change in this distribution will have its effect on the quality of work done in universities of the second category at least.

An objective rating of the quality or attractiveness of graduate programs is impossible. Subjective ratings, like the present one, are open to complaints of halo effect, of persistence of outworn images, and of other sorts of regional or personal bias. In the case of Cartter's thorough and painstaking study these criticisms have been foreseen and guarded against. There are numerous cases where recent changes in departmental quality have been reflected accurately in the ratings. Physicists can take particular satisfaction in the consistency of rating by the four different groups of raters and in the virtual absence of parochialism. The report is excellent

for careful design, clearness of presentation, and quality of typography. It will be indispensable to those with an interest in graduate education, both now and as a basis for future comparison.

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Behavior of solid matter

THE NATURE OF SOLIDS. by Alan Holden. 241 pp. Columbia University Press, New York, 1965. \$6.95.

by L. Muldower

This book is written for "anyone who has studied physics or chemistry in a secondary school" and aims to provide "a nonmathematical account of how some of the behavior of solid matter is understood at present." It is written by Alan Holden, a member of the research staff of the Bell Telephone Laboratories. He has been interested in high-school and college physics programs for a number of years.

The reviewer must evaluate the author's success or failure from two points of view: (1) How understandable is the result to the intended audience? (2) How faithful is it to the physicist's current picture of solids? On the whole, Holden has achieved his goal. His creation is quite readable and accurate; he gives some beautiful simple explanations of our theories of atoms and solids and the way they behave. While the subject matter sometimes becomes sophisticated, the treatment does not and the author does not hesitate to discuss subjects as elementary as powers of ten and the energy of springs. The reader should be able to obtain a good understanding of many of the concepts of modern physics starting from basic and simple ideas. In some areas (notably in magnetism) the author goes far back in history to introduce his subject in an intriguing way.

There are blemishes; many of these have arisen as a result of oversimplification or incompleteness. In discuss-