

# CALTECH'S 1963 ALUMNI SURVEY

## V. *The Caltech Experience*

by John R. Weir

A majority of Caltech alumni (59 percent of those stopping at the BS level, and 67 percent of those going on for advanced degrees) are now in the occupations they planned to enter when in college. What's more, they expect to continue in these occupations in the future. Only 30 percent of the BS's and 22 percent of those with advanced degrees have followed occupations different from those originally planned.

College graduation is worth all the time and effort it entails. This is the conclusion we can draw from alumni opinions. Eighty-two percent of those who did their undergraduate work at Caltech, and 76 percent of those who went elsewhere and came to Caltech for graduate work only, say that their undergraduate courses helped them a lot in their present occupation. Sixteen and 22 percent, respectively, say they helped some; and only 2 percent think they helped very little.

Similar opinions obtain at the graduate level. Eighty-three percent of those earning graduate degrees at Caltech and 80 percent of those earning them elsewhere say their graduate courses have helped a lot in their present occupations. Fifteen percent say they have helped some; and only 3 percent say they have helped little.

Even some of the alumni who say that their college courses only "helped some" in their present occupations are quite satisfied with their education, since 86 percent are satisfied with their undergraduate major and 90 percent with their graduate major. These percentages are similar to those in the 1952 survey. They were higher than the percentages among graduates from other technical colleges then, and are probably also higher today.

If it is safe to generalize from the replies to our questionnaire, we can conclude that the college or university one attends becomes to that person the best of all possible schools. Caltech alumni were educated in many different institutions, varying widely in size, location, quality, variety of offerings, and cost. Yet most of them would do their undergraduate work at the same institution if they were to do it over again, and those with graduate degrees are even more loyal to the place where these degrees were obtained. The alumni responded to the following question in this manner:

<i>In the light of your post-college experience, and if you had it to do over again, would you</i>	% under-graduate		% graduate	
	<i>At CIT</i>	<i>Not at CIT</i>	<i>At CIT</i>	<i>Not at CIT</i>
Attend the same college?	86	74	90	76
Attend a different college?	14	26	10	24

The figures indicate a somewhat greater degree of satisfaction with attendance at Caltech than at other institutions. Since we only offer degrees in science and engineering, we might expect a strong bias among alumni in the direction of a highly specialized curriculum. But this is not the case. Among those who attended CIT as undergraduates, 40 percent think their education was just right. Among the 60 percent who would prefer a change, five times as many would prefer it to be more general as would prefer it to be more specialized. Even at the graduate level, where one would expect an almost complete preoccupation with highly specialized study, the half that prefers a change is evenly divided between wanting more generalization and more specialization.

Alumni satisfaction with their own college backgrounds is surely best expressed in what they would

want for their own sons, and 80 percent of Caltech's alumni would encourage their sons, if properly qualified, to attend Caltech as undergraduates; while 91 percent would encourage them to come here to graduate school.

It is apparent that where qualifications to the general satisfaction occur, they are largely in the direction of a desire for a broader, more generalized college experience, particularly in the undergraduate years. This theme was reiterated many times in the written comments volunteered by alumni.

### *Educational Limitations*

On the last two pages of the questionnaire, we asked the alumni to name the factors which limited or interfered with their education and those that contributed most to their life after graduation. We also invited comments on the survey or on Caltech. By this means we hoped to gather information that would aid in evaluating many different aspects of a Caltech educational experience.

The response was gratifying, if somewhat overwhelming. More than 9,600 separate replies and comments were sent in.

In reply to the question: *What factors or events at CIT limited or interfered with your educational experience?* approximately half (2,354) of the alumni sample noted one or more items. (An additional 845 wrote "None," implying a kind of blanket approval of their experience.)

The "limitations" fell into five broad groups: Institutional (783), Personal (725), Curricular (619) Instructional (521), and Financial (428). The numbers in parentheses are the frequency with which that kind of limitation was mentioned. A few other kinds of limitations named were chiefly due to external circumstances which could not be influenced by the Institute or the student—such as World War II, or the stepped-up wartime V-12 program. Even smog was cited 24 times.

The most frequent limitation cited in the Institutional category was the intense competition and the emphasis on grades (137). Next came problems of student housing: 136 felt it was a definite handicap to have to live off campus; 32 felt the student housing was inadequate. On the other hand, another 32 felt that living in the student houses, with the horseplay and other distractions, had interfered with their progress in school. There were 194 complaints illustrating the desire for a less restricted and narrow environment: the absence of co-eds

(91), limited social activities (65), and the lack of variety in the student body (38). Lack of vocational guidance (68) or psychological counseling (32), and inadequate advisors (55) came in for considerable criticism. There were 94 miscellaneous statements that referred to the atmosphere and administration of the Institute. However, the Deans, those perennial targets of criticism in most colleges, were mentioned only three times!

In the "Personal" category, the more frequent limitations included immaturity, lack of motivation or self-confidence (236), inadequate academic preparation and poor study habits (90), too many extracurricular activities (68), problems of dating, marriage, and parenthood (64), and physical illness (50). Seventy-four wrote the equivalent of "my own making."

Almost half (286) of the inhibitors mentioned in the "Curricular" category were attributed to specific defects in some required courses, including P.E., or in a given department such as engineering. (A frequent comment was that the engineering courses were not practical.) Next most frequent were comments again evidencing the desire for a broader, more heterogeneous undergraduate experience: the courses requisite for a degree left no time for broadening the student's cultural base (63); there was a dearth of arts courses, a narrow curriculum (55); specific courses — and these were principally non-scientific — which the student would have liked to take were not offered (70). Last, but scarcely least (there were 145 of them), came comments on the work pressure: "lack of time" (66), "excessive homework" (25), and "study load too heavy" (54).

Most of the items in the Instructional category questioned faculty competence (307), about half of these criticisms being specifically directed at graduate student instructors. Another 88 comments spoke of faculty aloofness and indifference, and there were 37 who felt that the general faculty preference for research over teaching was a drawback to the quality of instruction. Too frequent and irrelevant examinations, or personality conflicts with faculty members, were also mentioned.

Financial limitations were mentioned 428 times. Exactly equal numbers listed the lack of adequate funds (199) and the need to work (199) as interfering in their college career. An additional 30 listed having a family to support.

Some of these limitations no longer apply to Caltech because of the changes that have been made over the years. As a matter of fact, when we divided the sample into three groups—pre-1940, the war

period (1940-1952), and post-war (1953 to the present)—and tabulated some of the most frequent criticisms, we found definite decreases in certain areas. Financial limitations have steadily lessened, as have criticisms of the lack of guidance and counseling, and inadequate housing. In the curricular area, the absence of specific non-scientific courses is being mentioned less in recent years, and the complaints about the impracticality of engineering courses have dwindled.

On the other hand, comment on many limitations has increased in recent years: the recognition of personal factors has gone up sharply, and so have criticisms of the emphasis on grades and the competitive pressure. Dissatisfaction with the restrictions of a rigid scientific environment has grown.

### Lifetime Contributions

Since 98 percent of the alumni believe that their college courses helped in their present occupation to some degree, can we assume that participation in athletics, campus politics, and social activities also had beneficial effects? To find out just what are the important experiences, we asked: *What non-academic activities or experiences during your undergraduate college years contributed most to your life after graduation?*

The most frequently mentioned contribution (913) was the formation of personal friendships with other students — made through many different contacts, including the student houses, campus politics, and social events.

The second most frequent was athletics, with 649. Usually this activity was valued because it taught the alumnus how to get along with other people and how to function as a member of a team.

The third most frequent, with 317, was learning to get along with a wide variety of people by working with them on a job, and successfully making one's own way.

In fourth place, with 216, were various kinds of social activities. The value most frequently mentioned was the help these activities gave the alumnus in feeling more at ease with other people.

It seems very significant that these four contributions are all valued because they helped the alumnus become more at ease and more skillful in human relations. The high frequency with which Caltech alumni attain managerial positions may account for the value they now place on this skill, as indicated by the fact that these four groups contained 2,095 statements. This is more than half of all the "con-

tributions" that were mentioned in the survey.

Musical activities was the next most frequently mentioned contribution to life after graduation. They were listed by 197 alumni. With the exception of athletics, music was mentioned more frequently than any other traditional extracurricular activity.

Athletics	649
Music	197
Student government	127
Newspaper, writing	97
YMCA	87
Debate, public speaking	83
Drama	49
Professional societies	48

In sixth place, with 170, was the social facility developed from meeting girls, going out on dates, and meeting the girl one later married. An additional 81 listed the encouragement and understanding they received from their wives as being of major importance.

Military service was next (130). Here the contributions to later life were attributed to physical conditioning, learning to live a disciplined life, and learning to live and work with many different kinds of people.

Next in order was a wide variety of hobbies (127), ranging from poker through judo to mountain climbing. Church attendance was mentioned 122 times, as were contacts with professors.

### Suggestions for the Future

The last page of the questionnaire booklet was left blank, with the heading:

*We would be pleased to receive any further comments you would like to make concerning either the California Institute or this Alumni Survey.*

A total of 1,007 alumni made additional comments. Many added several pages of discussion and suggestions—at the end of a very detailed 12-page questionnaire!

These comments were extremely varied and most difficult to classify. About a quarter referred to the questionnaire or the survey, a quarter were critical of some aspect of Caltech, a quarter praised Caltech, and a quarter offered suggestions for change of one sort or another.

Most of the criticisms of the survey were directed toward the opinion statements that required an "agree," "disagree," or "no opinion" reply. They were thought to be biased, black-and-white, oversimplified, and ambiguous. As one alumnus put it, "They sound as if they came right out of *Time* magazine." He was nearly correct. These statements were first used in a survey of U. S. college students

instigated by *Time* in 1948. Many items from this study were used in our 1952 survey so that we could compare Caltech alumni with other students. We retained several items in the 1963 survey to look for changes in attitudes and opinions since 1952.

A few alumni questioned whether the survey was in fact truly anonymous. It was, of course, in that no names or code numbers appeared on the questionnaires. In fact, considerable time and money was expended to achieve that degree of anonymity. On the other hand, the survey required a large amount of detailed personal data, so it might have been possible to identify a respondent if one cared to undertake the necessary detective work. But the effort required would make a top-secret-security-clearance investigation seem cursory by comparison. We certainly have no such inclination.

A total of 320 criticisms of Caltech were received. Many of them (140) referred to teaching and counseling needs, and they are included in the discussion of these "limitations." Among the remainder, the most frequently mentioned criticism (59) was labeled for purposes of analysis, "Humanization of Students." Although expressed in many different ways, this is essentially an objection to an overemphasis on technical subjects, a need for more liberal arts, and for more attention to human feelings and values. The socially impoverished atmosphere was blamed for producing graduates who are socially unaware and uninterested. Many times the desirability of Caltech's becoming coeducational was stressed as a way to meet these criticisms.

Some alumni thought there should be more humanities courses, and a wider variety of them, including more of the social sciences.

There were 341 statements of approval of the Institute. Alumni are proud to have gone to "the best technical school in the country," and they enjoy the prestige of being Caltech graduates. They like its being small and of high quality, they like its atmosphere of truly scientific research, and its emphasis on basic principles. There were 121 such comments.

Another 39 were especially appreciative of the humanities program and the contribution it made to their personal success after college. Individual professors in the humanities division were frequently cited as having profoundly stimulated the alumnus's thinking, or as having awakened him to new interests.

Another sizable group (71) approved of the many opportunities at Caltech for growth and development outside the classroom. For some it was the autonomy and freedom for self-direction given

the students by the Administration. For some it was the operation of the honor system. For some it was the student house organization. And for some it was the varied programs and speakers brought to the campus by the Caltech YMCA.

Out of a total of 279 recommendations for changes, 153 wanted curriculum changes, 37 related to non-academic student life, 29 suggested raising faculty salaries rather than buildings, 12 favored becoming coeducational, 11 suggested night and extension courses, and 11 suggested equating the Caltech grading system with those of other colleges.

There is no longer any basis for many of the sources of criticism, and suggestions for change that have been discussed here. There are now adequate financial resources to enable any deserving student to attend Caltech. The Institute now has a full-time psychologist available for personal and vocational counseling. Three more undergraduate and three graduate student houses have been completed, permitting all undergraduates and most graduate students who so desire to live on campus. Sports and athletic facilities have been expanded, and physical education requirements have been reduced. The undergraduate courses and curricula in physics, mathematics, and chemistry have been drastically revised, and the engineering program has become much more oriented toward basic principles. Undergraduate course requirements in many options are more flexible and permit many more electives in the sophomore, junior, and senior years. The number of humanities elective courses offered has doubled in the last decade. And, most recently, the Institute has begun a two-year experiment in which freshman grades have been abolished.

These are all very significant changes that have occurred in the last few years. They meet many of the criticisms of our older alumni. But they do not satisfy all the criticisms we received in our questionnaires. Nor do they represent all the changes suggested.

But neither are we finished with the survey suggestions. All criticisms and suggestions have been specially coded in terms of their content. These will be assembled into further analyses and studies that will then be circulated among the appropriate Institute faculty and administrative officers for further consideration. The Institute will certainly continue the process of self-examination and self-evaluation that led to the changes described, but from here on it will also have the benefit of the thinking and opinions of its alumni, expressed through the 1963 questionnaire.