

Aims and Goals of the Institute: A Faculty Committee Looks to the Future

By C. J. Pings

For the last 40 years Caltech has been an institution in which the faculty has had unusual influence and control over academic affairs, and active participation in the democratic processes of faculty government has never been more apparent than at the present. Large numbers of our faculty sit on elected and appointed committees, both Institute and divisional. An outstanding example of faculty participation in a major issue was the special committee appointed to advise the trustees on the selection of a new President of the Institute. Similar but less publicized groups have advised the administration on the appointment of other campus officers in the last several years. A number of committees, both elected by the faculty and appointed by the President, have been working toward better communication with our graduate and undergraduate students. In numbers unprecedented, except for World War II, faculty members have become involved in the problems of our society. There has been a long tradition of significant Caltech faculty contribution to various advisory panels for the federal government; this has now been augmented by a large number of our faculty participating in the political and social issues of Pasadena, the Los Angeles Basin, the state of California, and the nation.

Concern and interest for the future direction of the Institute and its place in our society lay behind the request made by the faculty some two years ago for the appointment of a special committee to consider the long-range objectives of the Institute. The formation of this committee was authorized at a faculty meeting on February 1, 1967, and the members were appointed on June 1, 1967, by Jesse L. Greenstein, then chairman of the faculty. This group of 20 to 25 faculty members, known as the Aims and Goals Committee, has recently issued a preliminary report of the Committee's conclusions compiled after two years of

study. The original Committee included no administrative officers, but since 1967 three members have assumed positions as division chairmen or executive officers; in each case the individual concerned raised questions of the propriety of further service on the Committee, but all have continued at the request of the remaining members.

The Committee met frequently during the summer of 1967 and during the 1967-68 academic year. This was an educational period, for it seemed unreasonable to attempt to project into the future without being well informed of past history, existing programs, and precommitments to future growth and development. During that year of study, real progress was made in understanding how the Institute operates, particularly the decision-making apparatus. The Committee then faced the difficult task of looking to the future, the resulting deliberations culminating in the provisional report just published.

In sending the report to the chairman of the faculty, the Committee noted:

"In preparing this report our objectives are rather modest. Primarily we are anxious to identify problem areas worthy of attention from either or both the administration and faculty. On issues so identified, we have attempted to indicate the range of views held by the Committee members. In certain cases the views so assessed are tantamount to a consensus. On the other hand, we have not let the absence of a unified Committee position deter the statement of a problem or an attempt to measure the spectrum of opinion on the subject.

"The ultimate disposition of this report will depend upon the will of the general faculty. Possibly our own reflections and the reactions of others will lead us to want to submit a revision as a final draft. In any event, we anticipate the dissolution of this committee before the end of 1969."



Committee members (left to right) George Hammond, Thayer Scudder, Robert Christy, David Smith, Thomas Lauritsen, C. J. Pings (chairman), Rochus Vogt, Herbert Keller, Rodman Paul, Norman Brooks, Fred Anson, Harry Gray, John Benton.

MEMBERS OF THE AIMS AND GOALS COMMITTEE
California Institute of Technology

CORNELIUS J. PINGS, Chairman
Professor of Chemical Engineering

FRED C. ANSON
Professor of Analytical Chemistry

JOHN F. BENTON
Associate Professor of History

NORMAN H. BROOKS
Professor of Civil Engineering

ROBERT F. CHRISTY
Professor of Theoretical Physics and Executive
Officer for Physics

ROBERT S. EDGAR
Professor of Biology

ROY W. GOULD
Professor of Electrical Engineering and Physics

HARRY B. GRAY
Professor of Chemistry

GEORGE S. HAMMOND
Arthur Amos Noyes Professor of Chemistry and
Chairman of the Division of Chemistry and
Chemical Engineering

GEORGE W. HOUSNER
Professor of Civil Engineering and Applied
Mechanics

FLOYD B. HUMPHREY
Associate Professor of Electrical Engineering

ROBERT A. HUTTENBACK
Professor of History; Master of Student Houses

HERBERT B. KELLER
Professor of Applied Mathematics

THOMAS LAURITSEN
Professor of Physics

WILHELMUS A. J. LUXEMBURG
Professor of Mathematics

RODMAN W. PAUL
Professor of History

THAYER SCUDDER
Associate Professor of Anthropology

ROBERT L. SINSHEIMER
Professor of Biophysics and Chairman of the
Division of Biology

DAVID R. SMITH
Associate Professor of English

FREDERICK B. THOMPSON
Professor of Applied Science and Philosophy

ROCHUS E. VOGT
Associate Professor of Physics

The report has been broken down into nine chapters of varying length. The total report amounts to some 600 pages. All of the recommendations obviously are not of equal importance nor held with uniform conviction by Committee members. Some are truly long-range and fundamental, while others are more involved with details of problems of the immediate future. In the opinion of the chairman, the following are particularly important conclusions from the two years of work:

- A. We are committed to continuation of our undergraduate teaching program, but there are opportunities for major improvements. Encouragement and support of innovation and experimentation with all aspects of education is needed.
- B. Given a choice of growing or remaining excellent and unique, we choose the latter. Since there is little support for growth for its own sake, we need to find ways to change faster than we grow.
- C. We support continuation of our strength in the humanities and social sciences, with cautious and controlled growth of our teaching and research in the social and behavioral sciences.
- D. There is need for modernization of the faculty political structure and increased involvement of the faculty in advisory roles to various administrative officers.
- E. We should seriously review whether the JPL association in its present form is in the continued best interests of the Institute.
- F. Greater involvement of the Institute in the affairs of Pasadena and the southern California community is necessary.

The Committee is well aware of imperfections in its conclusions, but we view this as an initial step. Nothing of this type has been attempted before by the Caltech faculty (and, to our knowledge, few other faculties have engaged in such introspection). The Committee hopes that the publication of this initial report will elicit considerable thought and reaction from the rest of the faculty, administration, trustees, undergraduates, graduate students, employees, alumni, and friends of the Institute. Indeed, the chairman of the Committee herewith invites anyone interested in the aims and goals of the Institute to offer a reaction, preferably in writing, to any member of the Committee.

Following is a list of the chapters with a summary

of the primary conclusions from each chapter.

I. INTRODUCTION consisting of a letter of transmittal and several appendices documenting the creation of the Committee and its initial activities.

II. GENERAL PROBLEMS OF GROWTH AND CHANGE AT CALTECH

1. We reaffirm our traditional aims, which were enunciated in 1921 as the pursuit of new knowledge and the education of exceptional people. We recognize that our efforts in research and education must have relevance to the aspirations of mankind, and we believe that we can best fulfill that responsibility if we take the long-range view.

2. Our tradition commits us to seek excellence through small size and a highly discriminate selection of fields of study. There appears to be no sentiment in the faculty for a growth in excess of a factor of two in the next decade, and the majority of our Committee feels that our growth should be limited even more sharply, perhaps to the extent that any growth in the undergraduate student body should be for the purpose of diversification or filling our currently underpopulated options.

3. There is a widely expressed desire to see a broadening of our intellectual base to include ventures into selected fields of social and behavioral sciences and humanities. At the same time, there are equally pressing ambitions for extension of our present work in the natural sciences and engineering. We need to find a way to change faster than we grow.

4. The present development plan places too much emphasis on facilities and too little on support for educational and research activities. Overcommitment of funds and space inhibits our flexibility and closes off options for new ventures. Our future depends upon our ability to attract outstanding people, and our plans should focus on this as the paramount need.

5. The Institute community needs to be more broadly informed and more actively involved in the planning process. Plans which affect the future of the Institute should be exposed to wide discussion before they have reached the stage of commitment. A faculty body should be charged with keeping itself informed of new developments and participating responsibly in their evolution.

III. INTRODUCING THE SOCIAL AND BEHAVIORAL SCIENCES AT CALTECH

6. The research areas in behavioral science that are now being opened up in biology and information

science seem to have not only promise but exciting possibilities. Support for them should be given a high priority, and they should not be held back from seeking additional funding from foundations because of any delays in starting the social sciences.

7. Until the mid-1950's the faculty of the Division of the Humanities and Social Sciences performed what was largely a service function, with little stress on scholarly endeavor. By leadership and example the present chairman of the Division has helped establish a tradition of teaching and research. The Committee supports the contention of most of the current faculty of the Division that, in the present competitive academic market, maintenance of a quality staff will be possible only if research is expected and encouraged. The Committee further urges a sympathetic recognition of the special problems that arise when faculty research is carried on without an accompanying graduate program.

8. The principal existing program in social science—that of the economists—is at a critical stage. A decision must be made immediately as to whether to commit the Institute to major support of this program, or to abandon all of it save the research efforts of individuals now on the faculty.

9. To continue along the present course in the social sciences, by hiring the additional persons that the remainder of the Rockefeller and Sloan grants would temporarily finance, will commit the Institute to a major long-range financial responsibility; for exhaustion of the limited Rockefeller and Sloan grants will leave Caltech with a program that is too incompletely staffed and conceived to attract outside funds, and yet cannot advance further without large additional moneys.

10. Support for a major commitment in the social sciences cannot be justified until and unless effective leadership, specially qualified in an appropriate social science discipline, is forthcoming.

11. If the decision is to make a major commitment, the following changes in emphasis and approach are recommended:

a. The "umbrella" approach should be abandoned in favor of more specific projects.

b. Accordingly, there should be a greater emphasis on the man rather than the program—on finding social scientists who are capable of developing their research as individuals, with only the relatively casual interchange that comes from having on the same campus men whose interests at times intersect.

c. There should be a determined effort to discover whether postdoctoral fellows could be used in the social sciences as effectively as they have been in the behavioral, so as to reduce the number of professorial appointments needed initially.

d. A comparable attempt should be made to discover whether a fairly extensive use of research assistants could take the place of graduate students during at least the initial phase of a program.

12. A review of the experience analyzed in this report strongly suggests that approval of any future major ventures into the social sciences should be contingent upon the following:

a. In the absence of a well-qualified man on our own faculty, a distinguished senior social scientist or a highly promising and widely known younger man should be recruited to serve as lead man.

b. Outside advice should be sought on a systematic basis.

c. In accordance with professional advice, "basic support should be guaranteed by the Institute" during the period of initial growth, until or unless grants can be obtained.

d. A satisfactory administrative status should be devised.

e. Provision should be made for special needs in regard to library, laboratory, and other physical facilities.

f. Consideration should be given to the possible effect of any proposed new program in diverting resources from existing programs or competing for space under the personnel ceiling. The anxieties that the social sciences have aroused in the minds of the humanists must not be repeated as between one social science program and a still newer one.

13. The Aims and Goals Committee is concerned that as yet there does not seem to be a provision for ever including psychology in the social science program, even though psychology is a discipline whose presence on the campus seems to be desired by both faculty and undergraduates, and even though experimental psychology is already a part of research in other divisions.

14. Because of their effect in diminishing one barrier to success in the social sciences, the Committee applauds the prospective increases in the library budget proposals for next year, which would virtually double the appropriation allocated directly to the social sciences and history.

15. Finally, the Aims and Goals Committee must

insist on recognition of a distinction that, however intangible, is nevertheless fundamental: The needs, preconceptions, and methods of social science will not necessarily be the same as those of the physical and natural sciences. Patterns of thought and action that have worked in the physical and natural sciences may at times be transferable to other fields, as the experience with the behavioral sciences suggests, but in other instances scientific patterns may be quite inappropriate. It is precisely because the social sciences promise to be different that some faculty members are urging support of them, in the belief that the campus needs greater diversity. But we cannot simultaneously seek diversity and yet also unconsciously expect conformity to the culture of a predominantly scientific community. A mutual attempt to understand each other will be the most important single prerequisite for success in any new undertakings that we, as "a company of scholars," may decide to venture.

IV. DECISION MAKING AT THE INSTITUTE

In its deliberations on decision making at the Institute, the Committee came to share a common perspective. Foci of responsibility and decision making should be defined and visible as much as possible. Equally important, serious efforts must be made to insure that all elements of the Institute can participate in advisory roles in shaping its future. We feel these conditions are necessary if we are to maintain on the part of the members of the Institute a sense of trust in one another and a sense of involvement and commitment ourselves.

In order to approach more closely these objectives, this Committee suggests careful consideration of the following recommendations:

16. The Board of Trustees should consider diversification of its membership.

17. Faculty representation at important decision-making meetings of the Board of Trustees should be strengthened.

18. Advisory faculty representatives should be included on trustee committees.

19. The Faculty Board perhaps should be converted into an "Institute Board" with representatives from administration, faculty, and students.

20. A mechanism such as a "Faculty Council" to explore and crystallize faculty viewpoints should be created.

21. The structure and duties of faculty committees should be periodically reviewed by an appropri-

ate faculty agency such as a "Faculty Council."

22. Ex-officio chairmanships of faculty committees should be abolished.

23. Divisional chairmen should have limited tenure.

24. The divisional structures and their alignment should be periodically reviewed.

25. Improved mechanisms for interdivisional efforts and their support should be developed.

26. The role and powers of the Division Chairmen's Committee should be defined and formalized.

27. The membership of administrative committees should be periodically reviewed. There should be a larger turnover in membership, and the base of advisory responsibility among the faculty should be broadened.

28. New advisory faculty-student committees to the administrative branch of the Institute should be created.

29. Graduate and undergraduate students should be more effectively involved in the decision-making process of the Institute.

V. UNDERGRADUATE LIFE AND EDUCATION

30. The undergraduate operation is important and essential. The existing program has much to recommend it, but there are opportunities for major improvements which should be seized.

31. The feasibility of establishing a coordinate college near the Institute should be seriously considered.

32. The undergraduate student body should be enlarged only to try to provide greater diversity in student interests and option selections.

33. Major attention and support should be directed toward incorporating the student houses more fully into the academic life on campus.

34. Possibilities should be explored to facilitate greater amalgamation of the undergraduate and graduate students within the student houses and wherever else it seems feasible.

35. Every effort should be made to find a mechanism for housing women undergraduates within the existing student houses.

36. Much greater flexibility in the undergraduate curriculum is needed. Individual options should be encouraged to offer several alternative means for satisfying their requirements. The common freshman year should no longer be regarded as essential for all students.

37. Undergraduate research should be strongly

encouraged and made more readily available in the most popular options.

38. Innovation and experimentation with all aspects of undergraduate education should be encouraged, supported, and rewarded. It would be well to emphasize this intention by labeling a portion of the proceeds of the development plan for this purpose.

39. The committee lauds the recent proposal that the office of Vice President for Student Affairs be created to represent student interests at the highest levels within the Institute.

40. An enlarged and broadened psychological counseling service is urgently needed and should be provided.

VI. THE HUMANITIES AT CALTECH

41. The social and behavioral sciences present themselves as being relatively little different in method and attitude from the physical sciences, whereas the humanities, dealing as they do with value judgments, genuinely provide not only a counterbalance but a valuable complement in the Caltech educational process. The differences between the two should always be borne in mind as the Institute seeks out its future.

42. Many of the faculty and staff would like to see more humanistic and aesthetic ferment here, not simply for the undergraduates' benefit but in order to enrich their own lives and this community.

43. As the Division of the Humanities and Social Sciences expands into the social and behavioral sciences, there is danger that the traditional humanities will be swamped. The Aims and Goals Committee urges that the important role played by the humanities be protected, strengthened, and even somewhat expanded.

44. The Committee supports the strengthening of teaching and scholarly activity in psychology and philosophy.

45. Any expansion in the humanities will necessitate a much larger library. The current acquisition rate threatens to jam the Millikan Library in a few years. The Committee advocates that planning for a new library facility be undertaken now.

46. The Committee recognizes that the existence of humanities majors and the student demand for increased course offerings at an advanced level are creating problems which need study.

47. In attracting new faculty members in the humanities, the Institute must face the fact that good men in those disciplines also want those research and

intellectual conditions which will allow them to advance their own scholarly development.

48. The Committee feels the efforts to enrich the intellectual experiences of our undergraduates will be greatly helped by exchange courses with other local colleges and universities (see also 31).

49. The Committee urges that funding be sought for an Institute of Advanced Study in the Humanities and Arts to serve as an instrument for bringing visiting scholars and artists-in-residence to Caltech.

50. As we view the future of humanities at Caltech, the Committee urges that we should not diversify at the expense of strength; we should select carefully the areas we wish to pursue.

VII. JPL, OFF-CAMPUS FACILITIES AND COOPERATIVE VENTURES

51. Laboratories or special facilities sponsored by the Institute in response to government requests, social needs, etc. should continue to be geographically and administratively isolated from the campus unless they are clearly related to the Institute's primary goals of teaching and research.

52. The Institute should periodically review its associations with various outside organizations which it sponsors or in which it participates. In particular the Committee believes that the need for Caltech help in the creation of an organization may indeed be important but that, after an appropriate incubation period, the sponsorship could well be terminated with no harm on either side. Initial agreements to participate in such programs should include explicit written provision for Institute withdrawal; in most cases there would be merit in term agreements which would permit the Institute involvement to automatically lapse unless positive steps were taken to arrange renewal.

53. The Aims and Goals Committee did not presume to discuss the future plans of JPL. However, the Committee did reflect on the future implications for the campus of the continued management of JPL by Caltech.

a. There has been very little involvement of faculty members in the research or space flight operations of JPL, but there are indications that the level soon will increase somewhat because of a more enlightened attitude of NASA. However, neither past nor future faculty participation in JPL activities is significantly dependent on the formal management relation.

b. There has been little participation by JPL

staff members in the teaching and research carried out on the campus, nor is it likely to increase.

c. The founding and early management of JPL by Caltech were clearly justified by patriotic duty. That factor is in the past, and the Committee recommends that it is now time to seriously review whether the association is in the continued best interests of the Institute.

54. There have been occasional proposals from some faculty members for the Institute to sponsor new laboratories of applied science in the Pasadena area. Even if such facilities would be useful to a segment of our faculty, the Committee believes that the creation and existence of such organizations are not critically dependent upon Institute backing.

55. The Committee anticipates a new pattern of federal science funding which will result in regional facilities for specialized research equipment. Some of these probably will be located on the Caltech campus, where they will be shared with qualified users from other schools. Care should be taken to provide for the Institute's graceful withdrawal from these arrangements when local interest in the facility wanes.

VIII. RELATIONS WITH THE COMMUNITY

56. It is the responsibility of the administration in consultation with the faculty to formulate policy as it relates to the community.

57. An appropriate Institute group or panel should be instructed to prepare a brief for the President and the Vice President for Institute Relations as the next step toward developing an Institute policy toward the community.

58. The time has come when the President and the faculty should be prepared to take a position on controversial community issues—as they relate, for example, to the Pasadena school system or to environmental and urban degradation in the Los Angeles Basin.

59. We foresee the possibility that a new type of national or international crisis (environmental degradation, for example) may require of Caltech something beyond a mere expression of opinion. In such a case, the Institute, consonant with its widened sense of social responsibility, may wish to involve itself more actively by sponsoring a major problem-solving venture analogous to the Institute's World War II activities.

60. While the Institute should never undertake commitments which bind its faculty without their consent, we believe the Institute, in widening its

sense of social responsibility, should encourage interested faculty to pursue appropriate action programs voluntarily.

61. We endorse the Carnegie Report proposition that "the university can, in regard to controversial social issues such as racial integration in housing, look carefully at its own practices and adhere to high standards on its own campus."

62. Caltech must ensure that contractors doing business with the Institute comply with the equal opportunity provisions of the law. We are aware that this is already the policy of the Institute; we support its firm execution.

63. Caltech's public image needs to be greatly improved by a more broadly based public relations effort to portray more accurately what the Institute actually does.

64. The administration should investigate the extent to which Institute physical facilities are used for community activities and ascertain whether or not additional commitments are desirable.

65. The Institute needs to consider carefully the pros and cons of extending its widened sense of social responsibility to California as a whole.

66. Caltech's various contributions to the community should be carefully inventoried and publicized to clarify what is already done.

IX. GRADUATE STUDENTS & RESEARCH FELLOWS

67. At the present time our program of teaching and research for graduate students matches rather well the capabilities and expectations of the students with the resources of the Institute. However, the Committee detects some signs that more and more of our graduate students are seeking an intellectual experience which is broader than, or different from, that of our traditional PhD programs.

68. We recommend that housing for married graduate students and research fellows, and their families, be provided at an early date.

69. Full faculty support should be given to the evolving Graduate Student Council and its associated committees within the divisions.

70. The Committee calls for greater recognition within the Institute community of the valuable dual role of our research fellows. This is our third tier of teaching, no less important than the training of undergraduate and graduate students; at the same time the research fellows make significant contribution in transmitting attitudes and real wisdom to our younger students.