

THE HUMANITIES AT CALTECH

by Rodman W. Paul

Not everyone who comes to our campus is aware that Caltech has a curious habit of insisting that an educated scientist must have some experience in humane fields of learning. A few months ago my wife and I were present at the annual reception given by President and Mrs. DuBridge for new members of the faculty and research staffs. We met a new couple, and my wife politely made conversation with the wife in this new pair. The other lady announced that her husband was dedicating his life to scientific research, and had come to Caltech for that purpose. Then she asked: "And what does your husband do?"

"He is a historian."

"A histologist? You mean biology?"

"No, he's a *historian*."

"But what does a historian do at Caltech?"

"He teaches."

"Teaches! Whom does he teach?"

"Students."

"*Students!* I thought Caltech was a research institution."

She was partly right. Caltech is three things simultaneously: an institution devoted to basic research in science; a large graduate school with 750 PhD candidates and several hundred postdoctoral students; and a small undergraduate college with about 700 students.

All three of these activities occupy the same small campus, share the same buildings, and draw their faculty and research staffs from pretty much

the same pool of talent, although there are some people, like the husband in this newcomer family, who are so exclusively in research that they never see a student, and indeed would be terrified if suddenly they had to face a freshman. Conversely, there are some people who have grown away from research and have gradually become teachers or administrators exclusively.

But we in the humanities find that most of our thinking revolves about the young undergraduates. I have been here since 1947, nearly 20 years. In that time the central fact of my teaching life has been the steady improvement in the quality of our students. I haven't had a dumb student in years. The performance in our classes has made all of us sharply aware that our modern students are brighter, more alert, better educated, and better motivated than even the quite adequate boys that we had 20 years ago. I can illustrate statistically what is happening by citing a couple of figures from the Admissions Office. Our admission procedure is of course based primarily on the students' showing in science and math, but it has been our experience that, as they have improved in science and math, so have they improved in all subjects. The only entrance examinations they take that apply directly to the humanities are the verbal part of the Scholastic Aptitude Test and the English examination.

Back in 1951, when our records with the College Entrance Examination Board begin, the mean score of entering freshmen in the verbal aptitude exam was 578; today it is 688. That score of 688 puts our freshmen in the 97th percentile of all scores nationally. Back in 1951, the mean score of entering

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freshmen in the English exam was 565; today it is 671, which puts our freshmen in the 92nd percentile of all scores nationally.

A study that is now in process in our Admissions Office suggests that our entering freshmen are higher in verbal aptitude than the freshmen at some of the most famous privately endowed liberal arts colleges in the country. Most of the colleges whose students have higher verbal aptitudes than ours are women's colleges or at least co-ed. I would not dare to speculate about what this means for the future of our nation.

The Caltech boy today

The Caltech boy as we see him today is sincere, eager, and young. Socially he is sometimes younger than most of his chronological age group. He has disciplined his mind into an effective instrument. He writes extremely well. Although he is less sophisticated in matters of politics, literature, and social issues than the best students at good liberal arts colleges, he catches on quickly. He is fun to teach — because he is responsive and rewarding.

Because these boys are so good, they deserve the very best. Anything less would be a breach of faith with the boys themselves, and with the parents and high schools that have sent the boys here.

Since we do feel this way about our job, we have been constantly striving to improve our work in the humanities courses, including both the courses that the boys are required to take and those that they may elect. (I should perhaps explain that a boy spends between 20 and 25 percent of his time in courses offered by our division.) Statistically I can give you a rough measure of the extent of change in the humanities by comparing the Caltech catalog published in 1947, the year that brought me to Caltech, with the current catalog. In the autumn of 1947 we had a humanities faculty of 25; today we have 45. In 1947 we offered a total of 42 courses; today we offer 80. And yet our undergraduate student body has changed very little in size. The additional men and courses represent our attempt to give the student a wider choice and richer offerings.

We are an expensive division to maintain. One of the several traditions that I found here when I came was that we do nearly all our teaching in relatively small classes — the average would be about 20 students per class. Obviously, this makes for a high cost per student. Another tradition is that nearly all of our teaching is done by the regular, full-time humanities faculty. We have no teaching assistants, and only 6 of the 45 humanities teachers this year are instructors who are still doing graduate work on the side.

This means that from the moment a freshman enrolls in History 1 and English 1, he finds himself in a relatively small class that is taught by someone who knows his subject and wants to teach it. What is more, another tradition that I found when I came here was that of good teaching. As classroom performers our humanities staff has always won high marks from its student audiences. Perhaps this is why, through the years, the humanities teachers have been especially close to the students in relationships outside of the class. It is a common experience to find the boys coming to one of their humanities teachers for advice on all sorts of questions that have nothing to do with classes. Like the Ancient Mariner, the worried freshman or sophomore stoppeth his English or history teacher to talk about himself (his favorite subject), or some scheme he has dreamt up, or the war in Asia, or his shy uncertainties about girls.

Still one more tradition that I found well established when I came here in 1947 was that the core of the humanities program was literature and history, with some economics. We offered a few other courses in those days, such as philosophy and psychology, but the variety was not great once you got outside literature and history. Today we still think that literature and history are central to man's ability to understand himself, because they represent the accumulated wisdom and the accumulated esthetic sense that make up modern culture. And we have always appreciated the significance of economics.

Division name change

But we have been aware also that it is possible to study modern society by processes of formal analysis based on the social and political sciences. Most of our new courses have been created in order to give the students a chance to learn more about politics, economics, social change, and personality. On December 6 the faculty voted its approval of a recommendation to change the name of our division to the Division of the Humanities *and Social Sciences*. On January 10 the proposal was approved by the Institute's board of trustees. This change symbolizes in part what has already happened to the content of our courses, and in part what we confidently expect is going to happen during the next few years.

Let me outline very briefly the more important of these changes that have been taking place within the humanities division. All of these have been conceived, debated, and brought into actuality during the 15 years since the present chairman of the division, Hallett Smith, took office.

The first, in point of time, has had to do with the field of public affairs. The inspiration for action here came from Caltech's senior scientists. During the Second World War, and during the crucial decisions over nuclear weapons immediately after the war, our senior scientists — such as President DuBridge, Charles Lauritsen, Robert Bacher, and the late Richard Tolman and H. P. Robertson — became deeply disturbed over the increasing necessity for scientists to deal with questions of broad public policy. The old cloistered atmosphere of prewar science was gone forever. Our scientists felt that the education we offered our science students should be enlarged to include both formal instruction in public affairs and chances for voluntary participation in discussion groups, seminars, and research projects dealing with this vast area of governmental policy and public problems.

Today all of our seniors attend a formal lecture once a week on some major aspect of public affairs. This is a required course. In recent years the stress in it has been on foreign policy. On an elective basis, any upperclassman can enroll in courses that deal with such subjects as arms control and military security, American foreign policy, modern warfare, contemporary Africa, southeast Asia (including India and Pakistan), and the Russian economy. Outside of class any student can go to our admirable Public Affairs Room, where he will find daily newspapers and magazines from all over the world, current documents of particular importance, and carefully arranged visual exhibits that are timed to coincide with, and reinforce, the lectures in our required course in public affairs. Thanks to a grant from the Carnegie Corporation, distinguished visitors are constantly being brought to the campus to give lectures and hold seminars on big questions that concern our nation or some foreign country.

A start on the social sciences

In providing opportunities for bright young men to mature in fields related to public affairs, we have gone far. I don't think anyone could complain about the intellectual diet now available in that sector. In the social sciences, on the other hand, we are only just well started. Recently we have added an anthropologist, a cultural geographer, and another economist. At the moment we are in the market for a political scientist, and we will probably seek still another economist, more political scientists, another psychologist, and another anthropologist or a sociologist.

We are tending to link up our developing efforts in the social sciences with our recently established work in public affairs. Thus, our cultural geograph-

er and our anthropologist are both African specialists, and we expect to specify that some of the additional social scientists likewise have their geographical specialty in Africa, so that we can focus our strength instead of scattering it thinly.

Experiments with the fine arts

All this talk of public policy and social science does not mean that we are forgetting our original dedication to fields that are more clearly "humane." Let me cite our modest but very fruitful experiments with music and the fine arts. In both instances we face the very practical problem that there isn't room in the course schedule for much formal instruction in those two fields, however much we may wish to the contrary. Accordingly, we have worked out a combination of formal courses and voluntary participation. The cultural resources of the Pasadena area are such that we have succeeded in borrowing the part-time services of an excellent teacher of music and an equally good man in fine arts. Each of these offers a course and is winning an enthusiastic response from a small group of students. But beyond that we put up, in the humanities building, small traveling art exhibits that are open to all who wish to see them. We have a regular concert series in the humanities building, mostly of chamber music, and there are big concerts of all kinds in the handsome new Beckman Auditorium. In addition, we have a large record collection in the humanities library. Any boy can check out records just as he checks out books. Finally, there is a "musicale" room in which good listening equipment is available for any boy who doesn't own his own.

In the field of music, the student response has been great. There seems to be a definite correlation between possession of a scientific or mathematical mind and enthusiasm for music. This has been reinforced very strongly by the current craze for hi-fi equipment. Even boys on scholarships seem to find the money to buy parts for hi-fi sets. Even the boys who are in academic difficulty seem to find time to assemble the hi-fi sets. Each designs and builds his own set and is fully convinced of the superiority of his machine over that of any of his neighbors. The worst of it is that they turn up their equipment full blast in order to drown out competition. Mozart competes with classical New Orleans jazz.

Less of a novelty, but at least as important, has been our determination to strengthen those three fields that traditionally have formed the central concern of the humanities division: namely, literature, history, and economics. After months of de-

bate, the faculty and the trustees finally took a most important step last winter when they voted that, for the first time in its history, Caltech would start granting undergraduate degrees in non-scientific fields. The only fields authorized so far are these three. We hope to add government — political science — within a few years, as a fourth field. At the moment we have neither the manpower nor the library resources to justify a major in government.

Too young to be sure

Behind this very significant change lies our formal recognition of a condition that has bothered us increasingly for a number of years. We know that our students are exceedingly bright and that they are easily capable of doing distinguished work in fields outside of science. But we also see mournful proof each winter that some boys commit themselves to science when they are too young to be sure of the wisdom of their choice. Suppose a boy who comes here to be a physicist discovers that college science is quite different from high school science and that what is really appealing is history or economics. In the past such students have had little alternative but to transfer to some other university, or else drag out an unenthusiastic career here at Caltech. Either solution involves wasted time, frustration, and a good deal of emotional strain.

Henceforth another alternative will be open to such students. They can remain here but major in a non-scientific field. The number of students choosing to so major will always be small. After all, the justification for Caltech is its distinction in science. We will continue to admit primarily upon the basis of an applicant's aptitude for science or engineering. But we will now give the boys a chance to change their minds after they get here. We believe deeply that these boys are too good to be wasted in frustration or lost purpose.

Establishing majors in the humanities is making it necessary for us to enlarge our teaching staff in the three fields of English, history, and economics, but we are using the additional manpower in ways that will benefit the whole student body, not just the very small number who will specialize in our disciplines. Our plan is to have the new hands teach in the basic courses as well as in the small, advanced ones. For example, this year we are beginning an experiment in freshman instruction. Our instructors have always complained that they have an inadequate number of class hours in which to do justice to their subject, and that the students don't have time to read deeply enough. This year, at the end of the first term, each freshman, as he finished

English I and History I, was required to choose between those two subjects for the remainder of the year. All of the time formerly divided between the two fields is being combined for the remaining two-thirds of the year, so that a boy will study either English or history, but not both. We are thus deliberately sacrificing breadth in order to make possible depth. We think it is important also to leave the choice to the student. Today's college student is a person who wants to have a say in the determination of his career, even if sometimes he makes mistakes.

At the sophomore level we are trying another experiment. Hitherto we have required all sophomores to take a survey course in American history. The only exception has been that for years we have run a totally separate class for 15 honor students, the brightest boys in the sophomore class. This year we are proposing a different scheme. We have greatly increased the number of upperclass elective courses in American history, and we have offered 70 of the brightest of last year's freshmen the option of stepping directly into these advanced electives, instead of going through the regular survey course routine. Virtually every one of the 70 accepted this new option with eagerness, even though traditionally the sophomore survey has been a well-liked course. The one doubt I had about this plan was that the morale of the 130 students who would be left in the survey course might be poor, but the three men teaching the survey course say this has not been the case. The explanation is partly good teaching in the present survey course, and partly the fact that the three men running the course have had the wisdom to raise the whole level of the survey course coincidentally with the inauguration of the new elective scheme.

Challenge and responsibility

There are other innovations that I could describe, but I think I have said enough to demonstrate that the humanities division is not lethargic. Indeed, we are doing so much all at once that I'm sure we will find, presently, that some of our departures are mistakes. But it is better for us to risk a moderate degree of error than to sit here complacently. There are two compelling forces that are driving us forward. One is the challenge of teaching the brightest and most rewarding young minds in America. The other is the responsibility for preparing these young men to live in an incredibly difficult world. This is not an easy assignment, but it is one in which we will succeed if the nation's high schools will continue to send us the fine young men who now fill our classrooms.