



Peter M. Miller, assistant director of admissions and undergraduate scholarships, interviews a prospective Caltech freshman.

Admissions at Caltech

by Peter M. Miller

Like a good many other institutions of higher learning, the California Institute has more qualified applicants for admission these days than it can handily make use of — and this is an understatement. The result is, of course, that many good boys are refused admission. Since the great majority of these boys will be offered admission by the other schools they apply to, a genuine curiosity arises as to what it takes to get into Caltech, and rumors containing only the required modicum of truth begin to circulate.

Is it true that a straight A average in high school is necessary before a candidate will be seriously considered at CIT? (Answer, no). Is it true that at least one 800 on the College Board tests is a prerequisite to admission at Caltech? (Answer, no). Is it true that a prize-winning project at a city, county, or state Science Fair will insure admission over boys whose entrance examinations are higher? (Answer, no). Is it

true that the boy from North Dakota or the upper peninsula of Michigan, because of the geographical outpost (from the southern California point of view) he represents, will be accepted ahead of a better-qualified applicant from San Diego? (Answer, again no).

There is, of course, *some* basis for these rumors or they would probably never have got started. It is true that boys with straight A averages will probably do better on their College Boards and will also probably get stronger recommendations from their schools than boys with lower grades. And it is true that as the number of our applications increases, so also does the geographical representation of our student body broaden. But a candidate, to be successful, is neither required to demonstrate genius in high school nor to live in an igloo in a geographical fringe area.

It is the purpose of this article to explain what the

requirements are for admission to Caltech, and to describe in some detail the operations of the Freshman Admissions Committee, which result in the choosing of the best freshman class it can find.

In the first place, the applicants must be male. This requirement is under constant attack, but so far there has been no weakening. The restriction seems to have little or no deleterious effect on the social blooming of the Caltech undergraduate.

In the second place, our candidates must have taken certain courses and received certain credits in high school. Four years of high school math are required; so are three years of English and one year each of chemistry, physics, and United States history. Beyond these specific courses there must be five other credits made up of courses that are primarily academic: languages, more English, more history, and more science are welcomed; so are no more than one credit for shop or engineering drawing. Coeducational cooking and driver education do not qualify.

Necessary prerequisites

These requirements are not arbitrary hurdles set up to see whether a candidate can successfully get himself off the ground in various areas. They are real prerequisites without which a student would be at a serious disadvantage if he ever found himself admitted to Caltech. Take the mathematics, for example. Four years of high-school mathematics will get a boy through trigonometry at least; and without trigonometry a boy is not prepared for the freshman course in analytic geometry and differential and integral calculus which he must begin as soon as he arrives at Caltech.

The same kind of thing can be said about the other requirements. Freshman physics and chemistry presuppose a year's study at the high-school level and waste no time getting into more advanced matters. And the humanities program a new freshman faces would (with the exception of a few boys of well-developed natural capabilities) be quite beyond the reach of anyone without the prerequisite English and history.

There are no specific grade requirements for these prerequisite courses, but a boy who has not done well in them in high school — particularly if they are the math and science courses — stands little chance of being admitted. Poor performance in these areas probably results from one of two things: Either a boy has not been interested enough in the courses to do much work (and this will show up in the College Board scores, and in the recommendation of the school, which is made out conscientiously by high school teachers and administrators); or he has found the work in high school too hard (and this, too, will be reflected in the test scores and recommendations). In neither of these cases would admission to Caltech be a good thing either for the boy or for the Institute. When I

say that a boy must have done well, I mean that he should have done work of B+ quality or better. We ask no more; and we can accept less if there is valid reason for a lower grade. But without extenuating circumstances, it is safe to say that work of at least B+ quality is expected.

A point that often surprises questioners is that we have no requirement that a boy have a high school diploma in his hand before he comes here. Most boys do, of course. But as long as the proper prerequisite courses have been taken, and as long as a school is ready to agree that a boy is ready for college work, we will consider him regardless of when he would normally graduate from high school.

Occasionally, a high school student comes along who has covered by his junior year all that the school has to offer in mathematics and science, the areas of his major interest. To insist that such a boy stay around another year just for the sake of a piece of paper seems poorly advised, nor do we advise it. We do, though, scrutinize such candidates more strenuously for signs of immaturity which might cause difficulty in freshman year, no matter how high the boy's intellectual potential. We have had only middling success here with boys who enter a year or so ahead of the normal chronological age; and the Admissions Committee tries to make sure with the younger high school applicants whether we would be acquiring an intellectual asset to the Caltech community or merely another problem for the Dean's Office.

Entrance examinations

If a college received applicants from no more than 15 or 20 schools, which over the years it would learn to know and trust (or distrust), there would be little need of entrance examinations. The school record would indicate clearly what the boy had done up to the present, and school faculty and counselors, who had recommended many boys to us in the past and had come to know the type of student who could make the grade here, would be able to interpret where the record was somewhat smudged or cloudy. But we receive applications from students at well over 1000 schools each year, and we cannot even begin to know the standards at more than a quarter of them. In order, then, to measure accurately a boy from Boise, Idaho, against a boy from Natchitoches, Louisiana, we have to use entrance examinations. The examinations used to be of our own manufacture, but for various compelling reasons it is not necessary to go into here, we now use the examinations of the College Entrance Examination Board.

I hasten to say that this does not mean that the College Board is dictating to us whom we will admit. The College Board is a service organization consisting of more than 200 member colleges and associations. Its primary aim is to simplify the procedures of college admission, for the applicant and the college. In

nationwide — to be accurate, worldwide — administrations, the Board offers the three-hour Scholastic Aptitude test (SAT) six times a year; and about ten (of which a student may take three at a time) one-hour achievement tests four times a year.

Colleges may require what tests they choose of their applicants. Since most applicants to college at present apply to at least three colleges to be sure of gaining admission to one, it is customary for a college to allow some leeway in choice of examination. The Caltech requirement is as specific as any: we require of every candidate for admission the Scholastic Aptitude test, the Advanced Mathematics test, and two of the three tests: Physics, Chemistry, English. Many colleges require only the SAT. Others are likely to ask for the SAT and three achievement tests, including the English test.

Mathematical materials

Supposedly, the SAT does not depend much on what a boy has done in the classroom; it tests, rather, his verbal fluency and his facility in quantitative thinking. If he has gone through freshman mathematics in high school, he can take the math part of the test without being out of his depth. It measures, not the amount of math he has studied, but his quickness, his accuracy, and his general reasoning ability with mathematical materials. A couple of sample questions should show the type.

- i. Which of the following fractions is closest in value to $1/3$?

A- $\frac{1}{4}$ B- $\frac{3}{8}$ C- $\frac{3}{16}$ D- $\frac{5}{16}$ E- $\frac{7}{16}$

- ii. In 1943, the United States imported 30 million dollars' worth of tea from Ceylon and India. If the total cost of the tea from India was 50% more than the total cost of the tea from Ceylon, how many million dollars' worth of tea came from India?

A- 7.5 B- 12 C- 18 D- 20 E- 22.5

The achievement tests, on the other hand, measure primarily what has been learned in class. Two examples from the Advanced Mathematics test follow.

- iii. If h , k , m , and n are positive numbers, k is greater than m , and n is greater than h , which of the following is (are) true?

I- $n+h$ may equal $k+m$

II- $k+h$ may equal $n+m$

III- $k+n$ may equal $m+h$

A- Only I B- Only I and II C- Only I and III
D- I, II, and III E- None

- iv. What is the smallest acute angle x which satisfies the equation

$$\sin(2x + 45^\circ) = \cos(30^\circ - x)?$$

A- 5° B- 15° C- 25° D- 30° E- 45°

There is a big advantage in having both aptitude and achievement scores on all applicants. In seven cases out of ten, there will be a high correlation between them. But occasionally a boy will come along with high aptitude scores and low achievement scores, and we will know that here is a bright boy who has neglected his work, or hasn't had the opportunity to take a good course in one or more important subjects. Whatever the reason, the state of his preparation is not such that we feel he can negotiate the difficult work of freshman year successfully. He does not get to try.

Or we may find a boy who scores well on the achievement tests and not on the SAT. This, in all probability, is a boy who has had material drilled into his head by good teachers who have spent considerable time with him. This speaks well for a boy's determination and a teacher's coaching, but it does not augur well for advanced courses in math or science where there will be no eager mentor at each boy's elbow. This boy, too, will probably be rejected.

I have been speaking as though the Admissions Committee examined each set of College Board scores and reached some kind of conclusion on them. It does not follow so painful a procedure. On the basis of several years' use of the Board tests, we have learned which among the required tests correlate highest with academic performance during our freshman year. A formula has been devised to give each test score the appropriate weight, and the test scores are fed into the formula as soon as they arrive. It is a matter of a short computing time only and the figures have produced a predicted grade point average (PGPA) for freshman year. The weights allotted to each score in the formula vary with correlation studies that are done. It is a good bet, however, that the Advanced Math test will continue to have the greatest weight.

Delayed data

So far in this article, we have seen a large number of applicants taking four College Board tests apiece and deluging the Admissions Office with data. If all the data came in nicely at an early point in the year and there were a month or two to work on them, Admissions Officers would be a happier lot. As it is, the final College Board scores are in our hands, at the most, two weeks before we hope to make our final decisions. This is much too late to let things go without doing any preliminary assessing and weeding.

What Caltech is now requiring is that all applicants take the SAT by February at the latest (they are advised to hold off on the achievement tests until March). The aptitude scores, available to us by mid-March, provide us with the early data we need.

On the basis of the aptitude scores alone, we make a preliminary rank-order list of all the boys who have applied. No final decision can be made on the basis of this list, because there is always the chance that

the achievement test scores will throw a few boys up from the depths and drop a few from the heights. But the preliminary list can be very useful in giving an indication of many boys who are likely to be admitted and many who have little chance. Much time is saved by concentrating on the former and slighting the latter, until such time as later information moves a few of the applicants to significantly different positions.

At this point in the discussion, with a preliminary rank list in our hands based on the SAT, it is appropriate to shift attention to the Freshman Admissions Committee, which now assumes great importance in the picture. This is a regular faculty committee, which has been given complete autonomy by the Institute in the field of freshman admissions. No campus office does anything more than pass on information to the committee, regardless of the prowess — intellectual, athletic, or financial — of an applicant the office would hope to see admitted. It is also as hard-working a committee as any among the faculty. Demands on its time are heavy throughout the year, but especially during the months of March, April, and May. The importance of what the committee does is such, however, that the demands are met ungrudgingly and by men who have given their time over a great many years — and understandably so, for essentially what the Freshman Admissions Committee does determines what Caltech is.

Caltech's committee

The committee consists at present of 15 faculty members, all but five of whom are full-time teaching faculty. There is the Dean of Admissions, the Dean of Students, the Dean of Freshmen, the Master of the Student Houses, and the Assistant Director of Admissions (all of whom teach in addition to their administrative work); and there are faculty members from the areas of math and science, engineering, and the humanities. Some of them are full professors, some associates, some assistants; some have been at Caltech for upwards of 20 years, some less than five.

What I am getting at is that there is no single rank group or age level that dominates admission to Caltech. The committee represents different points of view, different degrees of experience, and different academic backgrounds. What it is agreed in, however, is that its work is of the greatest importance, and that the considerable time spent on the perplexing problems of freshman admission deserves spending.

Each member of the Admissions Committee is made responsible for a certain number of applicants. They are assigned on a geographical basis, with, for example, one member getting the candidates from New England, one those from the Pacific Northwest, one those from San Francisco and central and northern California. Southern California, which still produces the largest single segment of applications, is split

among several committee members. Once each member gets his respective allotment of candidates, the problem is to decide which ones among them all are worth an interview.

The interview is used differently by Caltech than it is by most other colleges. We do not interview all candidates for admission (few colleges do) but we attempt to interview as many boys who look as though they might qualify for admission as we feasibly can. And we interview at a point in the whole admissions procedure where the result of the interview carries considerable weight — the point where the first reports from the entrance examinations indicate that the boy being considered stands some chance of being admitted.

Scattered possibilities

The economics of traveling to certain parts of the country for a small number of interviews makes it impossible, at least at present, to do much in the South. We could not justify the expenditure of sending someone to Alabama to see six scattered applicants, only two of whom look like possibilities for admission. The same holds true of Idaho, and Kansas, and South Dakota. There are enough applicants, however, and enough good ones, to make an interviewing trip in New England distinctly worthwhile. So is one along the Eastern seaboard from New York to Washington, and one around Chicago, and one to Washington and Oregon.

The determination of who should be interviewed (among those for whom geography does not act as a determinant) is something that has received much pondering. The interview is important to us, but it is time-consuming and expensive. We want to talk personally to as many as possible of the boys who will be considered seriously; but we want to avoid, and avoid gracefully without hurt feelings, the boys whose chance of being accepted is one or two in a thousand. And since interviewing, for the most part, goes on before all College Board scores are in, the decision is a delicate one.

The best solution the Admissions Committee has found so far—and this was used in the spring of 1958 for the first time — is to take the preliminary rank list based on the SAT scores alone, and go down to a point where it seems logical that all the boys who will eventually be admitted have been included. This point is down around number 700. All the boys above this point are considered for an interview, then, and all of them who are geographically within reach get one. Since we do not offer admission to anything like 700 applicants, this means that a number of boys whose chances of admission are slim are nevertheless given an interview. But the big advantage of this procedure is that we miss very few boys who rise to the readily acceptable area when complete information is in.

This is perhaps a good place to note that last year

Admissions at Caltech . . . *continued*

was the first time that alumni interviewers were used to any real extent. Certain spots in the past (like Buffalo, New York, and Tulsa, Oklahoma) have had alumni who took over interviewing for the Admissions Committee; but there have been few such places and no more than two or three men involved. In 1958, the great majority of the interviews in the New York City and Long Island areas were handled by alumni — who did, incidentally, a thoroughly workmanlike and commendable job.

It may well be asked what the purpose of the interview is so late in the game. We already know from his school record and his first College Board scores that the boy is a likely prospect. And we already know from the fact that he has filed application that he is interested in Caltech. The purpose of the interview is not to sell the boy on Caltech. Its purpose is, rather, to try to find out from information other than test scores and high school grades *why* he wants to come to Caltech, and whether he would be a good risk if accepted.

Admittedly, this is a difficult area in which to deal, but it is a most important one. Too many boys come here for the wrong reasons — the size, the location, the difficulty of gaining admission — and too many others come here without knowing what they are getting into. The result is a number of unhappy boys, and an attrition rate that is higher than we like to see.*

Teachers know best

An important point to be made at the outset is that the key part of the interview (what gives it real effectiveness from our point of view) is the talk with a boy's teachers that accompanies it. Almost all interviews are scheduled for the school a boy is attending, at a time when the school is in session. A half-hour or so is spent with the boy. But he is often uncomfortable and nervous, and he rarely gives the best impression he is capable of. As a matter of fact, a fair part of the interview with the boy consists in putting him enough at ease so that he can talk intelligently in the few minutes that are left about his hopes and aims. What really pays off is the chance the interviewer has to talk with a boy's recent teachers. These men and women have known him for at least a year, and usually longer, and they know what his aptitudes and capabilities and prospects are in the areas he will be working in at Caltech. Many times, five minutes with a clear-sighted teacher will make the whole school visit worthwhile.

Essentially, what the interviewer tries to find out is

*Of the 165 boys who entered in the fall of 1954, for example, only 99 graduated in 1958. There are ten or so more who will probably graduate one or two years later, having been delayed for a variety of reasons. But this still means an attrition rate of right around 33 percent.

whether a boy has a real desire to work hard in the area of engineering or science, together with a knowledge of what hard work in these areas really entails. This means that the interview is more than the assessing of social traits in a friendly chat with teacher or boy; it is more than the giving of information about what Caltech has to offer — though both of these elements are present in the purpose of the interview.

The interview is really an attempt to get at motives, to measure their strength, and to weigh their validity. The boys who are being seen have already demonstrated their ability to do good work in school; the interviewer does his best to find out whether, granted admission, the boy will continue to want to do this good work in the particular program and the special environment Caltech offers.

Detective work

There is no sure-fire way of getting this information from the boy or his teachers, just as there is no guaranteed way in an employment interview to find out how a man will really do on the job he is being considered for. Sometimes some prying into a student's leisure-time activities, into his hobbies, will give a hint. Sometimes it will come from his attitudes about his school work or about his teachers. Sometimes it can be gained from actions his teachers will tell about, *special investigations he has pursued in math, or physics, or chemistry*. Sometimes it won't come at all, and in such cases the interviewer may be thought to have failed. But in general, the interviewer is likely to come away from a school with increased knowledge of how much a student wants to study science or engineering, and with some feeling of how he is going to react when the going gets rough, as 99 out of 100 of our freshmen find that it does.

It is true, of course, that an interviewer likes to find among his candidates a president of the student body, a football star, an editor of the school paper. Boys who will add something to the Caltech student body are naturally hoped for above those whose doors open only to send them forth to class and close on them again as soon as classes are over. Regardless of this hope of the interviewer to find a civilized human being in the budding scientist, however, the boy who is going to be admitted must show more than the signs of being a good fellow and a prospective big man on campus. He must demonstrate, or at least suggest, that the proper area for him is either engineering or science, and that he is willing to work at it for better or worse from this day forward.

By the time the interviews are over, it is nearly time for the final admissions decisions to be made. The interviewers hurry back from the corners of the world they have been exploring to find out what changes on the rank list the College Board achievement tests have

Admissions at Caltech . . . *continued*

made. Many who have been interviewed will now have fallen too low for serious consideration, but only a few totally unexpected candidates will have risen from below rank 700 to the point where they can be seriously considered.

There are, of course, a certain number of boys living in noncentral areas who will not receive an interview no matter how high they stand. These boys are in a curious position: there is little chance that a hidden spark will be transmitted through the papers that accumulate in a boy's folder; on the other hand, there is no chance for the interviewer to unmask the phony, or to steer the genuinely perplexed student away from the shoals of math and science, which an interviewer might have labeled as not for him.

The best thing to say about a boy who receives no interview because of physical inaccessibility is that he has just as good a chance of gaining admission as an interviewed boy; but if he is an unusual case — a boy with real potential whose record looks mediocre, or a boy with a splendid record about whom we should be suspicious — either he or the Institute may suffer because there has been no interview.

Final roundup

Everything is now ready for the committee meetings, which take up the better part of a week. Each member of the Admissions Committee has a number of boys he is responsible for. On each he has five College Board scores (the SAT yields two, the achievement tests three) a predicted grade point average, a 3½-year high school record, and a school recommendation. On most he also has the notes he made when he interviewed the boy and his teachers. There are 180 places in the freshman class to be filled. In order to get this many freshmen we send out roughly 300 offers of admission. Those who have received bigger scholarships elsewhere, or whose mothers won't let them travel 3,000 miles to college, or whose apparent interest in coming to Caltech has given way to the desire for another college, will drop by the way, and approximately 180 students will remain for the next freshman class. But this is premature. The problem now facing the Admissions Committee is which 300 to pick.

Here the final rank list based on complete College Board scores comes into use. Boys who are near the top of this list and have their school and interviewer firmly behind them are almost automatically accepted. There are, however, among these top boys some whose school is lukewarm in recommendation, and others about whom the interviewer has particular reservations. These cases are brought up, thrashed out, and voted on, and the committee is then ready for the "fight" cases.

A "fight" case, technically, *can* involve a high-rank-

ing applicant whom an interviewer does not wish to see admitted; more often it concerns a boy whose College Board scores have put him farther down the list, but who has, the interviewer is prepared to swear (and often does), exactly the qualities Caltech is looking for. If the interviewer can convince the rest of the committee that this is so, and that the lower ranking on the entrance examinations does not indicate that the work here will be too much of a struggle, the boy is in. In cases of this sort, the Admissions Committee is glad to be convinced; it is not, however, quick to be so.

Three case studies

It might be informative to close this discussion with three case studies, giving insofar as possible the pertinent information the Admissions Committee had to work with and the decision it reached.

Case #1 attended a large high school in the Northwest, where he ranked 18 out of 475. His College Board scores were: SAT-Verbal 718, SAT-Math 746, Advanced Math 800, Chemistry 794, English 695, giving him a PGPA of 3.376 and a rank on our list of 15.*

The school was eager to have the boy admitted to Caltech, but the interviewer detected something a little odd in the recommendation. The counselor who was urging him on us so strongly was doing so because Caltech would be so good for the *boy*. It would get him away from home, where he was overprotected, and start him off fresh in an area where he could try to achieve something.

This suggested that there had been something wrong with the pattern of his achievement in school, which proved to be true. The boy was not accepted by his classmates, who simply didn't like him. As a result, he attempted to shine academically and concentrated on grades. Grades assumed a tremendous importance for him: they were what would show everyone that he was, after all, a worthwhile young man. The only activity in school life that showed up on his record was membership in the Math Club, and it turned out that this was automatic on admission to the advanced math course of senior year. For the rest, the boy concentrated solely on getting high marks.

*College Board scores range from 800, the highest possible, to 200, the lowest score given. The national average score is 500, and two-thirds of the scores reported in any one year will lie between 400 and 600. Roughly 95 percent to 96 percent of the scores will be between 300 and 700. A score in the 700's will thus place a candidate in the upper 2 percent or 3 percent of the students taking the examination.

This score scale is the SAT score scale. The achievement tests are reported on the same scale, but the achievement scores are tied to SAT scores. Thus, if a more able group, generally, takes a particular achievement test, as is the case with the Advanced Math test, the average score will be higher and a score in the 700's will mean less. The national average on the Advanced Math test, for example, is 600; and about 20 percent of the students taking the test score in the 700's.

Admissions at Caltech . . . *continued*

The interviewer presented the case to the Admissions Committee, who voted to reject the boy. The decision was not based on the boy's lack of group acceptance, but rather on the fact that he was a "compensator." A compensator is someone who makes up for lack of general acceptance by concentrating in an area where he can do well — marks. Grades, rather than learning, take on great importance for him and he will argue and struggle for the A+ over the A to an extent surprising to the beholder. The good grades this boy has achieved in math and science do not indicate anything at all as far as desire to work in these areas is concerned; they indicate simply a desire to be accepted for his attainments.

But the Admissions Committee was not so much worried about the proper field for this boy: its foremost concern was that the competition of a small, highly selective college like Caltech might be so keen that the boy, once admitted, would not be able to get his A's, might not even end up in the upper half of his class. Such a perfectly possible occurrence might well rip the boy wide open emotionally, and the psychiatrist in residence would see more of him than the faculty for the limited period he would be here.

Perfect potential

Case #2 attended a parochial school in the Middle West, where he ranked number 2 in a class of 94. His College Board scores were: SAT-Verbal 624, SAT-Math 765, Physics 726, Advanced Math 800, English 645, giving him a PGPA of 3.139 and a rank on our final list of 111. The boy was strongly recommended by his school, which praised his "superior ability, especially in math and science," and his "excellent character" as well. He was described as respected by fellow students for his superiority in studies, his accomplishment in activities, and his personality. His activities were Student Council, varsity basketball and baseball, Forensic Society, and membership in a dance orchestra. The interviewer found him strongly interested in Caltech, a prospective student of electrical engineering, and well aware of what electrical engineering was about.

The interviewer recommended Admit; the committee agreed. This is a fairly normal, uncomplicated case.

Case #3 attended an independent school in the Middle Atlantic states, where he ranked 6 out of 89. His College Board scores were: SAT-Verbal 687, SAT-Math 683, Advanced Math 614, Chemistry 678, English 589, giving him a PGPA of 2.468 and a rank on our final list of 658. He was strongly recommended by his school, whose headmaster wrote, "He applies himself with serious purpose to his studies and has the definite ability and interest to do good work in science." The school listed him as respected by his fellow students for superiority in studies, accomplish-

ment in activities, leadership in activities, success in athletics, interest in other students, and personality.

The interviewer was impressed with this boy and made a fight case of him, as was certainly necessary at rank 658. He agreed with the school that he was a splendid campus citizen, but he was particularly impressed by the boy's accomplishment in mathematics, where he had compressed four years' high-school work into three and had launched himself well into the study of calculus on his own. He was further impressed by the boy's mature attitude toward his academic goals. The boy was as good in the humanities as in the sciences (and the College Board scores bear this out). Though strongly interested in the humanities, the boy had already determined the field he wanted to work in (biochemistry) and had done enough investigation in the field, under the guidance of a good chemistry teacher, to know a good bit about what he was aiming at. The chemistry teacher corroborated the boy's story and recommended him highly.

Committee action: On the basis of the interviewer's "fight," the school's recommendation, and knowledge based on experience of the value of this particular school's stamp of approval, the Committee voted to Admit.

The search proceeds

This is perhaps enough to give a general picture of the admissions procedures at Caltech. Rather than a summary, a word in farewell may be in order. The Freshman Admissions Committee has no thought that it has achieved the ultimate in admissions *expertise* — or even that it is using all the right and all the best criteria. The Committee is sure of some things, however. In the first place, its members go all-out to get the best freshman class they possibly can. They spend a great deal of their own time and the Institute's money doing this, and they feel that both the time and the money are well spent.

In the second place, they feel sure that there are ways of improving on their methods and they are doing their utmost to find them. The procedures change each year — probably not always for the better. But each change is an attempt to close up some chink whereby an undesirable student was admitted, or to sharpen a hook from which a very desirable student made his escape before he was landed.

And in the third place, the committee members know that, whether or not they are using the best data and the best methods, and regardless of how far they are from reaching Utopia, Caltech gets a freshman class every year that any college would be proud to see enter — a class whose individual decisions to come to Caltech have saddened the hearts of Directors of Admission the country over.