CALTECH NEWS

April 1984

#2

San Diego votes light pollution protection for Palomar

The San Diego City Council on February 6 reversed its earlier stand on high-pressure sodium (HPS) street lights, and voted 6-3 to convert the entire city to low-pressure sodium (LPS) lights.

The conversion would assure that Palomar Observatory and San Diego State University's Mount Laguna Observatory will not be blinded by light pollution from San Diego. LPS street lights emit light in one line of the spectrum, which can be filtered out of astronomical observations. HPS lamps emit light that is spread across the spectrum and cannot be filtered.

In their February 6 vote, residents acted to replace 17,000 mercury vapor street lights and also 10,000 HPS street lights with LPS lighting. The vote reverses an earlier 5-4 stand against LPS lights by the council in June 1983. Council members who changed their votes cited figures showing that the city can save $200,000 annually in energy and maintenance costs by installing LPS, rather than HPS, lights. The vote came after a two-hour debate in which Palomar Director Gerry Neugebauer and Assistant Director Robert Brucato spoke on behalf of the Institute.

"We're extremely pleased that San Diego has agreed to adopt a policy in favor of LPS lights," said Caltech Director of Public Relations Tom Branigan, who played a major role in Caltech's two-year effort to persuade the city to change its policy. "We're cautiously optimistic that the city will follow by voting funds to effect the change within a reasonable time."

Continued on page 10

Why do small, young companies tend to be the industry revolutionaries, generating the majority of radical new inventions? Jennifer Reinganum builds mathematical models that propose answers to questions like these.

Of technological change and cheating on taxes

By Dennis Meredith

Dr. Jennifer Reinganum builds models — not the stick-and-glue variety, but finely wrought mental constructs of mathematical equations. An associate professor of economics at Caltech, she is an economic theorist who, rather than directly examining the mechanics of individual corporations, assembles the statistics collected by other economists who do perform such case studies. From these, she seeks to understand in a fundamental way how some segments of the economy behave.

This theoretical enterprise can often lead into far-flung regions of the economy, as evidenced by her current projects. In one effort she is trying to understand the economic engine that powers technological advance in industry. And in another she and colleague professor of economics, Louis L. Wilde, are developing a model of tax evasion that includes the impact of eroding ethics — decried by many observers — on our country's coffers.

Both these ventures have yielded surprises. For instance, in her models of technological change in industry, Reinganum has discovered why it may actually be more profitable for industry leaders to be cheapskates when it comes to investing in new technology.

And her work with Wilde on tax evasion has led to a surprising but tentative conclusion that a vigilant IRS can use enforcement to offset even the most extreme rise in the number of taxpayers who are willing to gamble on tax evasion.

Her efforts to understand technical change would seem all but impossible, considering the huge range of technologies and the diversity of companies that operate in the marketplace.

For example, while the computer industry is the scene of a creative uproar, with revolutionary machines peppering the marketplace, the auto industry enjoys its landmark profits by relying only on modest advances in established technology. The steel industry, in sharp contrast, remains an economic disaster area, burdened with outmoded technology.

"My models require that I first abstract from the details of case studies of specific industries or companies, in order to focus on a general phenomenon," she says. "I examine the economic incentives affecting the phenomenon, and then propose a logical, consistent mathematical model of the behavior of individual actors which captures these economic incentives.

"The real test of these models is not their mathematical and/or economic elegance, but their ability to explain the observed data."

For example, in her studies of technical change, she has sought to explain why small, young companies tend to be the industry revolutionaries, generating the majority of radical new inventions.

At first, it would seem that the industry leader's survival, as much as a new upstart's, would depend on aggressive innovation. Thus, both should be willing to invest equally in new inventions. But the leaders tend to underinvest relative to the challengers, and the key to this strange state of affairs lies in the considerable profits the large company can garner during development of the new invention.

Please turn the page

Jennifer Reinganum on technological change

Continued from page 1

"Since the industry leader receives higher profits than the challenger during the time preceding a successful innovation, the current industry leader has a lower incentive to invest in R and D than does a challenger," explains Reinganum.

In the case of minor improvements in a product, however, the industry leader gains the most benefit, and thus is likely to invest more.

"This is because the challenger gains only a small market share from an incremental innovation, while the industry leader loses both some of its market share *and* its ability to price monopolistically — it must now compete on price with the successful challenger."

Of course, points out Reinganum, the marketplace is not necessarily wide open to new entrants; established leaders may have patent protection, better access to loans, and established lines of distribution that a newcomer can't match.

In another model, Reinganum has explained why companies climb on the bandwagon of a new invention one by one, rather than all at once. Most theories have tried to explain why new inventions diffuse slowly into industry by postulating differences in the companies. For example, these theories would hold that company A may have more adventurous managers than company B. Reinganum finds such explanations unsatisfactory, because explaining such differences is difficult.

"Can it be that more and less progressive managers are equally successful? If not, one would expect companies to get rid of the inferior type and substitute the superior type."

In her model, Reinganum has found that different companies march to different drummers in innovating because, although the benefits of being first are higher, so are the costs. Pioneers have to pay the price of installing untested equipment and training workers in unaccustomed new technology. Conversely, although the costs of being slow to adopt new technology are lower, so are the benefits, as the number of competitors already using it multiply.

"Therefore, a company will be indifferent between, say, being the first to use the process and paying higher adjustment costs and being the second to use it and paying lower adjustment costs," says Reinganum.

In their studies of tax evasion, Reinganum and Wilde improved on previous studies that ignored the government as an active player. By including the Internal Revenue Service in their models, the Caltech economists were able to address a key worry of many in government.

"One major concern of legislators and law enforcement people was that the country's ethics are eroding, and that this erosion could lead to widespread tax cheating," she says.

"In our model, we distinguish between the honest taxpayers and those who are willing to cheat, given the right situation. But we also distinguish between those who are willing to cheat and those who actually *do* cheat. The number who are willing to cheat is independent of enforcement, but the number who actually *do* cheat will depend on enforcement policies such as audits and sanctions.

"We found that *if* the IRS is responding optimally to increased willingness to cheat by increased auditing, the increase in the number willing to cheat will have no effect on the final number who *actually* cheat." This surprising finding stemmed from the fact that increased fractions of those willing to cheat changed the equilibrium, resulting in the same overall level of cheating as when the fraction which was willing to cheat was lower.

"When there is an increase in the number who are willing to cheat, the probability that any given one of them actually does cheat must go down," says Reinganum. "This is because a low report of income is now more likely to come from a cheater than an honest citizen with low income; if a greater number actually did cheat, this would tip the balance out of equilibrium and the IRS would engage in increased auditing, thus *reducing* the attractiveness of cheating.

"These two effects exactly cancel each other out, leaving the aggregate number of evaders and the aggregate number of audits unchanged," she says.

Reinganum and Wilde's studies suggest that very high fines for tax cheating might both deter cheaters and reduce the number of audits necessary, but institutional constraints often limit the severity of sanctions. However, the economists stress that their model still requires further examination.

"This is still work in progress," says Reinganum. "Before we can have confidence in this model, we must send it around to other economists and see how it stands up to the criticism of our colleagues."

Creation of Army analysis center generates controversy on campus

The creation of an Army analysis center at JPL became an issue of some controversy on campus in late January, as the result of questions raised by the faculty over the appropriateness of the center as a Caltech function.

At a faculty discussion attended by approximately 200 of Caltech's voting faculty members, President Marvin L. Goldberger and Provost Rochus E. Vogt traced the history of the center, outlining the reasons why the administration concurred with the Army in creating it, and describing the commitments that now exist.

After the presentation by Goldberger and Vogt, the faculty discussed the issues at length and overwhelmingly endorsed by show of hands a resolution that said, "We recommend that once Caltch's present commitments have been carried out, Caltech divest itself of the Arroyo Center expeditiously and in a responsible fashion at the earliest possible time." A motion to immediately divest did not pass.

Said Goldberger in response to the vote, "We will seriously take into account the guidance of the faculty on this issue."

At a meeting for students a week later, attended by about 200 persons, Goldberger and Vogt said the administration has made a decision to divest itself of the center as rapidly as is feasible but in any case in less than three years, after honoring its commitment to participate in its establishment.

A decision on was made by Caltech in late 1980, as funds from NASA shrank, to permit JPL to take on work up to 30 percent of its staff-years from the Department of Defense. (The current level is less than 20 percent.) This decision was made to enable the lab to keep teams assembled for NASA projects that involved unmanned planetary exploration and space science. The faculty supported that decision.

Nearly two years ago, the Army decided that it needed an independent think tank, performing a role comparable to that of the Rand Corporation for the Air Force. Negotiations were opened with JPL and the Caltech administration about establishing an Army analysis program at the lab.

The result was the Arroyo Center, established formally in 1983 as an integral part of JPL and located in JPL's Foothill facility — home of most of JPL's analysis programs and of much of the work that it does for the Department of Energy.

Work of the Arroyo Center is exclusively analytical, involving long-term policy studies and independent analysis. There is no hardware development. The work, about one third of it classified, will involve experts in sciences, technology, strategy, and geophysics to analyze a wide range of Army problems. Under terms of the agreement, JPL may decline any task or research project proposed by the Army.

Dr. Richard A. Montgomery (MS '46, PhD '48) became director of the center on October 1, 1983, and is part of a staff of 23 professionals and three office workers. Anticipated expansion would bring the center staff to about 90 professionals and 45 support personnel. Current Arroyo Center studies include those aimed at: reducing cost and increasing efficiency of Army personnel, hardware, and supply; better and cheaper technologies for space- and land-based communications, navigation, intelligence, and weather forecasting; better understanding of the Soviets and their strategic policies; improving verification methods to support a ban on chemical warfare agents; and identifying possible future crisis areas for the 1990s.

Substantial faculty concern centered around the fact that the Arroyo Center is involved in policy studies for which JPL historically has little expertise. Faculty members noted that this would make it necessary to hire personnel in areas not connected with the lab's mainstream activities, and thus depart from the goal of taking on defense work to maintain existing staff.

Some faculty members also expressed concern that the lack of people on campus with expertise in the new areas might make supervision and review difficult.

Others wondered whether Caltech should lend its prestige to a program not directly related to the Institute's traditional goals in education and research, and whether the Institute might become too much identified in the public mind with a military think tank.

"The administration is acutely aware of these issues, and will implement safeguards to deal with them effectively," said Goldberger.

On being an RA: If it seems like a job, then don't do it.

The RAs congregate for a family shot in the Master's Office. Standing: Robert Hill. Seated, from left: Sally Rigden, Debra Kremer, Richard Kremer, Morgan Gopnik, Tom Bondy, Douglas Schmitt, Cheryl Schmitt. Seated, center: Tim Pearson.

By Winifred Veronda

When Morgan Gopnik and her husband, Tom Bondy, were thinking about becoming resident associates in Fleming House, they received some sage advice from Theresa and Kristian Meisling, the RAs who preceded them: "If it's going to seem like a job, then don't do it."

Morgan and Tom didn't feel that being live-in friends, counselors, trouble shooters, and dispensers of Band-Aids and aspirin to 80 Flems would seem like a job, and they took the position. They haven't regretted it.

"I come from a big family," says Morgan. "I love having people come around and talk. If you like being surrounded by people, being an RA is great."

Morgan, a graduate student in environmental engineering science, and Tom, a law student at UCLA, are among five couples and two singles who chose to make their homes in the student houses as resident associates, gaining a perspective on undergraduate life at Caltech that few others can match.

Some of the RAs acknowledge that their image of Caltech undergraduates has undergone a substantial change since they began to live in the houses on a daily basis. "As graduate students, we tended to see the people in the labs as fulfilling the Caltech undergraduate stereotype," say Doug and Cheryl Schmitt of Page House, "the ones who worked, worked, worked all the time, to the exclusion of everything else. As RAs, we've seen what a diverse group they really are."

The RAs themselves, like the undergraduates, are a diverse group — particularly in national origins. Mark and Jane Crawshaw, RAs in Blacker House, came to the U.S. from England, Mark with a BA degree in mathematics from Oxford and Jane with a degree in French and English. Here at Caltech Mark is doing graduate work in mathematics, with Alexander Kechris as his adviser.

Douglas and Cheryl Schmitt came to Caltech from southern Alberta, Canada; he from Milk River, she from Lethbridge. Both earned their degrees from the University of Lethbridge. Here, Douglas is a third year geophysics student in work leading to a PhD; his adviser is Tom Ahrens. Cheryl is working on a PhD in physiology at USC.

Robert Hill of Lloyd House came to the U.S. in 1977; his wife, Sally Rigden, arrived a year later. Both earned degrees at Australian National University. At Caltech Robert completed a PhD in geology under Leon Silver; Sally is working for a PhD in geology under Tom Ahrens. This winter, Robert moved on to a post-doctoral fellowship at Cambridge, England, and Sally will join him when she completes her degree. Eventually they hope to return to Australia, preferably to university teaching positions.

Tim Pearson of Ricketts House is a fifth-year graduate student earning a PhD in chemistry under Sunney Chan's tutelage. He did his undergraduate work at the University of Aston in Birmingham, England.

Richard and Debra Kremer arrived from a site closer to home; they did their undergraduate work at Harvey Mudd College and got married after graduation. Richard is studying for a PhD in physics in Kellogg Laboratory under Charles Barnes. The Kremers are expecting a baby in May.

Don Skelton, a member of the Caltech professional staff, was recruited more than three years ago by Dabney students to be their resident associate, and served in that role for three years. "I taught the undergraduate physics laboratory for ten years," he said," and some of my best students came from Dabney House. I found them open, accepting, unpretentious." He was happy to accept the invitation.

The RAs moved into apartments in the houses, and into roles with loosely structured guidelines. The phrase "to be available" seemed to sum up their role the best. The RAs eat dinner in the house dining rooms, they let their apartments become a focus for drop-in visits and informal social life, they serve dinners or brunches — to large groups or small — at intervals throughout the year, they defuse conflicts that damage house morale, and they talk with students who are simply lonely, or who are having problems — academic, personal, or otherwise. They shepherd them on, if necessary, to a more specific source of help. In case of illness or accident, they drive a student to a doctor or to an emergency ward.

"We've been involved with a motorcycle accident, a diabetic coma, and a few broken bones," says Robert Hill. "Once I was at the Huntington Hospital emergency ward so many times over three or four days that the staff got to know me by name."

Within the houses, the RAs have evolved styles comfortable to them and to the house members. In traditional, competitive Fleming House, noted for red t-shirts bearing big white F's — and, on occasion, for red robes at commencement — Gopnik and Bondy find their roles relatively simple. "In many ways," says Gopnik, "this is the easiest house in which to be an RA. The students are self-sufficient, social, well-adjusted. About the most we have to do is to hand out Band-Aids and aspirin, and walk around and say, 'What's new? How's it going?' "

Gopnik and Bondy have been entertaining small groups of Flems at weekly suppers — a break from the former RA tradition of weekly doughnut nights for the entire house.

"We wanted to invite a few people at a time so we could get to know them," says Morgan. "You can't meet people when they rush in for doughnuts and leave. But last week we gave in and had a doughnut night

Please turn the page

and they enjoyed it so much that we'll probably do it again." Morgan also serves brunch periodically to Fleming House women.

Skelton, who lived in a house known for openness and individuality, held open house once a week and served wine, cheese, lemonade, cookies and crackers. He says he spent quite a bit of time counseling the students not to burn themselves out academically and get "intellectual indigestion."

"Dabney House students are a very gracious group to live with," he says. "They're concerned about other people's welfare, and they help each other as much as they can."

A symbol of this graciousness, he notes, is the tradition of welcoming new members with a glass of champagne rather than a shower. Other traditions: a Thursday night steak dinner with the cooks carefully trained in how to prepare steak Dabney-style; an Ides of March event at which members dressed up in togas and assassinated the house president; and a mock Salem witch hunt. Skelton found these moments of "instant theater" one of the most delightful parts of living with the students.

Tim Pearson lives in a house whose members many years ago earned the appellation "Ricketts Rowdies." That stereotype may have applied a bit when he became RA several years ago, but Pearson feels it is no longer appropriate. Brake drum riots are still held once or twice a term, as sophomores and freshmen fight for possession of the brake drum trophy, but the ringing of the drum is now a signal to "riot" in the field by the gymnasium, not in house corridors.

Annual Meeting Notice

NOTICE IS HEREBY GIVEN that pursuant to the bylaws of the Alumni Association, California Institute of Technology, the annual meeting of the members thereof will be held Thursday, June 21, at 6 p.m. in the Athenaeum, 551 South Hill Avenue, Pasadena, for the purpose of transacting any and all business that may come before such meeting of the members.

ARNE KALM, BS '56, MS '57,
PRESIDENT

DONALD P. WILKINSON, BS '48,
TREASURER

PAUL H. WINTER, BS '44,
SECRETARY

In their RA apartment in Lloyd House, Robert Hill and Sally Rigden-Hill check the scores of Lloydies Horace Greeley (standing) and Russ Graymer on a music trivia quiz that Hill created.

Douglas and Cheryl Schmitt became RAs in Page House last fall, after a session in the house library where some 50 members grilled them intensively about their interests, their experiences in living and working with people, and whether they smoked. Page House did not want any smokers.

To get to know the 90-plus students in the house, and the almost 50 off-campus social members, has been a challenge. The Schmitts invite small groups of students over for midnight snacks, and cooked Thanksgiving dinner for 35 students who were in the house over the holiday.

"Keep your sense of humor. If you come in on a judgmental level, you're in trouble. If you can get the students to laugh at their pretentions and not take themselves too seriously, and take the same advice yourself, then being an RA is a marvelous experience."

A house strong in its traditions, Page competes vigorously with Fleming in athletics, and in other, less structured areas.

"The members use traditions as a means to make life predictable," Douglas believes. "If something has been done a certain way, they want it to continue like that."

Robert Hill and Sally Rigden of Lloyd live in a house where "the students are very diverse. Most are tolerant and accepting of the other people in the house, and there aren't many rivalries. Rivalries do exist with the other houses in interhouse sports, but generally the attitude about sports in Lloyd is, 'Let's play to have a good time.' "

Hill and Rigden invited all the freshmen to dinner at the beginning of the year, and have been serving ethnic dinners to small groups of students on a sign-up basis. "We go chase the ones who won't sign up," says Hill.

Although living in a house with up to 90 students does cut down on one's privacy, the RAs generally have survived their fishbowl existence with a minimum of strain. Most open their doors when they are ready to welcome drop-in guests, and close the door when they need privacy. But, adds Hill, "The students know that if anyone has an emergency, we expect them to bang on the door until one of us comes out."

A more serious frustration than interruptions, says Morgan Gopnik, is concern that "they might not be willing to come and ask for help. Then I feel that I'm not being useful."

Rotation and the undergraduate house system — matters of some controversy among students this year — generally get good marks from the RAs. "In the houses," says Richard Kremer, "students are nurtured socially until they feel at home and can stand on their own feet. Students wouldn't automatically be a part of a dorm, but they are automatically part of a house."

Kremer points out that students can become social members of other houses, and can move there if room is available.

"The house system doesn't inhibit people from making friends with people in other houses," says Robert Hill. "Freshmen and sophomores generally socialize with people from their own house, but as they become juniors and seniors they form more friendships with people in other houses through contacts in classes."

"The house system is good," says Tim Pearson of Ricketts, "if its objective is to provide students with a supportive atmosphere. It falls down when people are pressured to conform to house patterns, and when it places artificial barriers around students so that they cut themselves off from people in the other houses."

"This is an easy-going house," says Pearson. "It doesn't have a tightly knit fraternity environment. Tolerance is a hallmark, and the motto on the house t-shirts is 'Take me as I am.' I like a house that allows for the development of individuals."

Major house traditions, says Pearson, are an annual dance when the lounge is turned into a Parisian bar, and a cocktail party once a term for faculty members.

Pearson notes that the Ricketts House government is working to revive a faculty associates program, in which selected faculty members are invited, during the year, to come and meet members at dinner and receptions.

The Kremers, whose housemates are the 95 on-campus members of Ruddock House, give dinner parties each week for about six students, and Debra's cookie jar on the coffee table is always full of her special blend of oatmeal or chocolate chip cookies.

The Kremers feel that one of their functions has been to defuse conflicts before they affect house morale. "Often there's one button that we can push, one person we can talk to, to resolve a situation that's been causing a lot of discontent," said Richard.

The Kremers find Ruddock a diverse house, with plenty of room for individualism. A favorite tradition is the birthday joke: On birthdays, the student of honor tells a

Vol. 18, No. 2 **April 1984**

Issued six times a year (Feb., April, June, Aug., Oct., and Dec.) and published by the California Institute of Technology and the Alumni Association, 1201 East California Blvd., Pasadena, California 91125. Second class postage paid at Pasadena, California. Postmaster: Please send address changes to *Caltech News*, 1-71, California Institute of Technology, Pasadena, CA 91125.

EDITORIAL STAFF
Executive editor: Winifred Veronda
Staff associates: Heidi Aspaturian, Phyllis Brewster, Diane Davis and Neil Saccamano
Photographer: Robert Paz

USPS 085-640

favorite joke at dinner. House members vote, thumbs up or thumbs down, on whether the joke is sufficiently funny. A thumbs down vote means a shower for the birthday celebrant. New house members also get showered as a welcome at the end of rotation, but can avoid this honor by not coming around that particular evening.

Mark and Jane Crawshaw live in the smallest of the undergraduate houses — Blacker — with 50 to 60 residents. They serve snacks to students each weekend, and invite them to small dinner parties on a rotating basis.

Hill and Rigden believe that the rotation system — designed to give like-minded students the opportunity to live in the same house, actually gathers students together on almost as random a basis as would dormitory assignments.

"Each student gets to eliminate some undesirable choices. And none of them know whether they were picked first or 40th. The older students are good about keeping this information confidential."

"During their years in a house, people grow enormously in self-confidence, ability, and willingness to express themselves," says Pearson. "They come to terms with Caltech life and with the pressures here. Because the house was the place where they went through this process, they'll always feel a strong loyalty to it.

"The house system is widely accepted. To change it would take a lot of energy."

The RAs in general are impressed with the amount of effort that Caltech puts into looking after its undergraduates. "If a problem emerges, students have a lot of support within the house system," notes Rigden. "They have their friends, the RAs, the master. They have the deans and the Health Center, whose staff can call a psychologist in an emergency. They get doughnuts once a week at the Master's Office, and money is potentially available to fix up their rooms."

"These kids get a lot more support than students at our school got as undergraduates," say the Schmitts.

What's the key to survival as an RA? Says Don Skelton, "Keep your sense of humor. If you come in on a judgmental level, you're in trouble. If you can get the students to laugh at their pretentions and not take themselves too seriously, and take the same advice yourself, then being an RA is a marvelous experience."

Caltech's house system: helpful or harmful?

By Phyllis Brewster

Reform is being proposed for the Caltech house system. Not for the first time, but for the same reasons.

On November 22, a public meeting was held in Ramo Auditorium, sponsored by the Caltech Y and the Master's Office, to give undergraduates a platform for discussing what had become, in the preceding few weeks, touchy issues regarding the house system — specifically rotation, the perpetuation of undesirable house customs, and barriers between houses.

The issues were anything but new. The criticisms being projected bore striking resemblances to rhetoric of yesteryear, especially to passages in Robert Huttenback's 1968 publication, *Confessions of a Genial Abbot*. Huttenback was at that time leaving the post of master of student houses — after ten years in that position — to return to full-time teaching in the Division of the Humanities and Social Sciences (he is currently chancellor at UC Santa Barbara). He was recording for Caltech posterity attitudes and activities of undergraduates during his reign.

"Caltech was, if anything, too house-oriented," Huttenback wrote. "Students tended to identify with their houses more than they did with the Institute itself . . . and defended with an ardor they never transferred to social and political issues . . . time honored customs which were no longer totally relevant."

And, quoting a student report of that year: "The problem of the houses perhaps centers on the fact that the student, without making a conscious choice, tends to adopt a pattern of living based on the existing house prejudices and traditions — a pattern which is irrelevant to the aims with which he came here. The houses tend to destroy individualism and create new individuals based on house desires."

So much for voices of another decade. In the November 22 panel discussion, three undergraduates challenged their colleagues to take a criticial look at some of the current negative attitudes and traditions that are passed down from one house generation to the next. Three other panel members, while acknowledging that nothing is perfect, defended the house system.

The first voice of the new generation of critics had actually spoken out several weeks earlier in "An Open Letter to the Freshmen," published in the *California Tech* just before rotation. Its writer, Behzad Sadeghi, a junior in math, questioned the value of house traditions that focus on humiliating freshmen. "In most houses," he wrote, "freshmen are put down, poked fun at, or treated disrespectfully by some resident upperclassmen with the implicit consent of the house." These traditions, he said, are perpetuated by upperclassmen simply because that's how they themselves were treated as freshmen. And, under such social pressures, they take part in these activities under the banner of transferring the "spirit" of the house.

"In their search for attaining the noble qualities represented by the image of Caltech," he continued," the freshmen thus come to adopt the superficial features presented to them by the upperclassmen. In their quest to become part of the society governed by the ideals of the Caltech image, they begin to abandon their own hard-earned system of values and independent judgment."

About 80 out of the total house population of 520 joined the verbal exchange in Ramo. Many more were involved, however, in house meetings held prior to the November debate, to find out house-member opinions on the issues.

Rotation was the target of panel speaker Lily Wu, a junior in engineering. Calling the process of rating freshmen "medieval," she recommended a system of house assignment based entirely on the preference of the freshmen.

John Krehbiel, a senior in engineering, defended the present system as "worth preserving," and thought that both the house and the frosh have "about the right amount of say" in selecting each other. He also expressed the belief that it is important to house members to "feel wanted" — to know that they were picked, not assigned.

An opinion from the audience that "it is important for us to have something to say about who will live next door to us," was greeted with expressions of agreement from others present.

Comments on the negative effects of homogenization of the house populations were countered with the argument that the system "helps maintain house character and provides automatic friendships for new students."

Please turn the page

Dinner time in the houses can be a calm interlude in a hectic day — or a raucous occasion for tension release. Food free-for-alls, harking back to the days of the Pajamarino before the annual Caltech-Occidental football game, still erupt occasionally.

"House members need to feel picked, not assigned"

Continued from page 5

Mike Chwe, a junior in social science, asked why houses should have character at all. "The characters of houses help students exclude things from their lives, and tend to reinforce insecurities rather than help [students] grow up," he said.

Although many of the public debate salvos were aimed at rotation, in the opinion of one RA, "that is just a symptom of the real problems — that the house system is stultifying, that there is a lack of freedom, and that control is sometimes held by a very small, tight group."

For a few weeks following the public meeting, discussion of the issue, both in the *Tech* and in the houses, was lively and divided. Now that the dust has settled, some longer-range views have appeared. However, they, too, are divided.

- A relatively small number of undergraduates are disturbed about specific practices, such as rotation rating-sessions, freshman "orientation" (harassment), and house conformity pressures, and would like to see an organized overhaul of the house system.
- Another group, probably larger in number, while agreeing that changes need to be made, believe that improvement will come gradually.
- Still another group, probably the majority of undergraduates, are content — or resigned — to accept the house system as it is, and "don't want to be bothered thinking about the situation." Among the second group is newly elected ASCIT president Paul Graven. "The house system works pretty well," says the Caltech leader, who himself has membership in three houses. "But I think the furor has done some good. It has made house members look at some of the activities that need improving. I have the feeling that the problems will be solved piece by piece."

Sharing his feeling is Sergay Mnatzakanian, a senior in applied physics. "It was a good meeting, and the criticisms are partially valid," he says, but adds, "It takes a lot of effort to get people's attention about something that isn't immediately threatening to them."

Senior Theresa Birdseye, who lives off-campus but is a member of two houses, has similar views. "There are definitely some things that can be changed, but a sudden major revamping is out of the question." Birdseye defends the hijinks that freshmen are introduced to by comparing them to "rites of passage," and maintains that freshmen not amused by "the game" are not forced to participate [she often didn't]. But she believes they dish out almost as much as they take, and, once it is over, they feel that they really belong to their house.

Others, like Sadeghi, however, are not willing to wait for time to take its course. In response to one widely held student attitude — "Yes, perhaps *that* needs changing, but no one has come up with a better idea" — these Techers are currently engaged in drawing up proposals that they hope will result in some reforms. (They report being encouraged by the discovery that an unsavory custom of the fifties — freshmen having their heads "swirled" in a flushing toilet — was done away with in the sixties.)

One suggestion is that a committee be elected, with the power to make changes. The committee would go house to house, talk over problems, and work up a plan for change.

Students are also working on suggestions for events that will introduce "social creativity" among the houses.

In preparation for the presentation of their proposals, the group is planning to publish a collection of essays and articles on the house system that have appeared over a period of years.

"You have to change negative attitudes from within," says one member of the group. "The key is for the undergrads to feel that something can be done to change what isn't positive."

Braun Laboratories win engineering achievement award

The Braun Laboratories in Memory of Carl F and Winifred H Braun is the recipient of the Engineering Project Achievement Award for 1984, sponsored by the Institute for the Advancement of Engineering. The $15-million, four-level, tile-roofed building was formally dedicated in December 1983. It houses 180 research staff in biology, chemistry, and chemical engineering who carry out work in molecular biology, immunology, and cell-surface chemistry.

The Associates welcome their new members

William A. Fowler, 1983 Nobel Prize-winner in physics, was guest of honor and speaker at The Associates' dinner honoring new members and their sponsors. Fowler named his illustrated account of his adventures in Sweden "The Queen and I." Above: President Marvin L. Goldberger greets Berneice Anglea, president of The Associates, and Gordon Hampton.

Mr. and Mrs. Donald Wright (Sharon) with Mr. and Mrs. John Nickols (Lois) — all new members of The Associates. Wright is president of the Los Angeles Times*; Nickols is chief of security for the* Times.

Hello, it's the Alumni Fund calling!

As a volunteer for the Alumni Fund telephone program, Graydon D. Bell (MS '51, PhD '57) telephones a fellow alumnus from the Alumni House, asking for support for the Fund.

Women's foil team places second in conference

Basketball team posts strong pre-season record

The 1983-84 basketball team won four games and lost two during November and December. In early January, the Beavers came back to defeat Christ College 68-63 and to triumph over Life College 63-55 to give the Tech team a 6-2 record — one of the most successful pre-seasons in many years. Among the defeats — a varsity loss to the alumni, 63-55.

Sophomore Jim Helgren and freshman Ed Zanelli averaged almost 20 points per game in the pre-season, while Stewart Peebles headed all NAIA players in rebounds, chipping in about ten points per contest. Caltech became a fast-break team this year with Ed Zanelli, John Krehbiel, and Tom Heer in the lineup. All three forced turnovers and moved the ball quickly down the floor to increase scoring.

Bill Gustafson, the second freshman to make the varsity team this year, started in most games and has been especially strong in defense and rebounding, along with sophomore David Werntz.

The Beavers opened league play against Pomona-Pitzer and lost, 96-48. They went on to lose to Occidental, 94-47, to Whittier, 101-37, and to Claremont, 91-45. Tech played Pacific Coast Baptist Bible College on January 24 and lost a close decision,76-71. Redlands defeated Tech, 77-25, as did Pomona, 87-44

Caltech played two of its finest games of the year against LaVerne and Occidental, in round two of league play. The Beavers held a 12-9 lead over LaVerne ten minutes into the game, but lost 75-44; against Occidental, Tech was behind only 37-26 at halftime but faltered 87-68 in an impressive showing. When this article was written, Claremont led the SCIAC conference with an 8-0 record, while Redlands was in second place with six wins and three losses. Caltech still had five games to play.

Peebles, Tom Heer, John Krehbiel, and George Pitt are ending their basketball days at Caltech this season. Says Coach Mike Poizner, "They'll be missed for all the zany times we've had during basketball season, and we wish them good luck."

Captain Stu Peebles won NAIA player of the week honors this year," reports Coach Poizner, "and Stu has a following wherever we play."

Men fencers rebuild

This was an exciting season for Tech fencers. The men's épée team fought hard, but not successfully. During the first half of the season, Tech was one man short and competed two (James and Kenny Bell) against three. When Charles Todd joined the squad, it was too late for him to overcome his inexperience. The record: 0 wins, 12 losses.

Meanwhile, the men's foil was rebuilding, and Scott Grossman found his stride at the season's end. Kurt Anderson and Andre Burgoyne gained valuable experience for next year and Craig Keller, who joined the team during the second term, shows great promise. The year's record: 12 wins, 11 losses.

Sabre provided some success as Tech tied for fourth on victories, taking fifth on tie-breaking procedure. Chien-Wei Han led a team of Lee Sunderlin and Peter Konopka, and late in the year, a promising freshman, Scott Lewicki, joined the team. The record was 4 wins, 8 losses.

Women's foil team takes second place

Now for some good news! The women's foil team won second place in the conference. Barbara Turpin consistently gave outstanding performances, and Captain Kathy Sheedy, Phyllis Li, Karla Peterson, and Daniela Bonafede each did their part. In individual competition, Turpin placed 4th out of 35 women and was close to third place, qualifying to compete in the NCAA Western Regional Championships at the Air Force Academy. The women's team record was 8 wins, 4 losses.

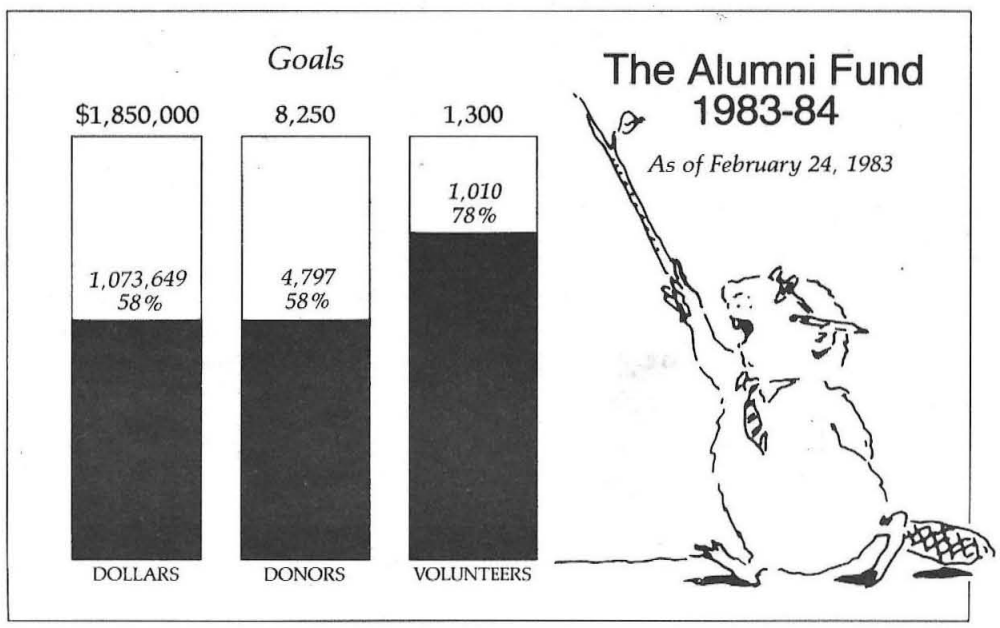
"I'm proud and happy to work with Techers," says Coach George Clovis. "They try hard, and show good sportsmanship and excellent attitudes in either victory or defeat. We have a lot of fun!"

Wrestlers make opponents take notice

Caltech's 1984 wrestling team moved up a notch or two from the past two seasons with seven new faces and some stunning victories. Head Coach Lin Parker saw a young team with four freshmen and three sophomores mature into a SCIAC force that could not be ignored or taken lightly. The Beavers were close to victory in every contest and defeated conference teams LaVerne (34-18) and Whittier College (36-24).

Emerging as top wrestlers were team captain Paul Gillespie from Salt Lake City, campaigning at 158 pounds, and Tim Cotter, who transferred from Bucknell, at 150. Gillespie, freshman Mike Burl, and Joe Williams all wrestled well, scoring in the 15th Annual Caltech Invitational Wrestling Tournament won by Biola College. The coveted Thomas W. Latham Award went to Page House wrestler Mike Burl, who also won the Max West Trophy for his excellent line play during the 1983 football season.

Elsewhere in the conference, Claremont and Pomona shared the title by placing in the top spots in dual meets and at the final SCIAC tournament.



Men's swim team compiles 2-3 record

The men's swim team compiled a 2-3 record, with wins over Whittier and Redlands and losses to Claremont, Occidental, and Pomona-Pitzer. During the SCIAC championships at Caltech's new swim complex, the men's team finished fourth in the conference. Coach Clinton Dodd said, "This was the closest battle for position in my five years at Caltech."

The championship, a four-day contest, pulled Whittier and Caltech in a dead heat at the end of each day. When smoke cleared at the meet's end, the tallies were Caltech, 132, and Whittier, 125. Winner was Claremont-Mudd, last year's NCAA Division III second-place team.

Leading the team was Dave Watkins with 56.02 in the 100-yard fly. Jim Labrenz added speed in middle-distance and swam a 52.13 in the 100-yard free. John Sarapata did outstanding times in breaststroke events (2:20.55 in the 200-yard breaststroke) and should qualify for nationals next year.

Other members were Paul Haase and Burnham Greeley, who did a fine job in middle-distance and back, and Paul Graven and Steve Hsu, who contributed in breaststroke. Paul Piccirillo and Hans Hermans led the way in sprints and middle distance. Alan Murray, the only senior on the team, placed third in one-meter and three-meter diving, and will be sorely missed.

"Each swimmer swam his best," said Dodge. "I was so pleased with everyone."

Women's swim team: fourth in conference

The women's swim team swam to a 1-6 dual meet record this year. Early in the season, sickness, field trips, and injuries contributed to a poor showing, but the team came together for the SCIAC championship, where the divers gave Tech a large lead. Then the women held off Redlands until the last day of the competition, as had the Tech men swimmers. The women's team placed fourth in the conference, ahead of Whittier and Redlands.

Said Coach Dodd, "Every swimmer did her best. She knew what she

Continued on page 9

Alumni Board nominates new members

The Board of Directors of the Alumni Association met as a nominating committee on February 8, in accordance with section 5.01 of the bylaws. Five vacancies on the board, a chapter representative, in addition to the positions of president, vice president, secretary, and treasurer, are to be filled. The current members on the board, with the years in which their terms expire, are:

Lee T. Carleton, BS '33, 1984
Trent R. Dames, BS '33, MS '34, 1986
Robert M. Drew, BS '69, 1986
Carole Hamilton, PhD '63, 1986
David J.D. Harper, MS '77, 1986
Arne Kalm, BS '56, MS '57, 1985
William J. Karzas, BS '49, PhD '55, 1984
Max S. Kreston, BS '50, 1986
Robert B. Leighton, BS '41, MS '44, PhD '47, 1985
Richard G. Lipes, PhD '69, 1984
Philip M. Neches, BS '73, MS '77, PhD '83, 1984
Lee W. Ralston, BS '27, 1985
J. Robert Schreck, BS '34, 1986
Adrian C. Smith, Jr., BS '70, 1984
Neil J. Stefanides, BS '53, MS '54, 1984
Gregory P. Stone, BS '74, MS '75, 1984
Don Wilkinson, BS '48
Samuel N. Vodopia, BS '54, 1984
Paul Winter, BS '44, 1985

The following individuals have been nominated for terms beginning at the close of the annual meeting in June 1984:

President: Carole L. Hamilton, PhD '63 — 1 year
Vice President: Donald P. Wilkinson, BS '48 — 1 year
Treasurer: Paul H. Winter, BS '44 — 1 year
Secretary: David J.D. Harper, MS '77 — 1 year
Past President: Arne Kalm, BS '56, MS '57

Directors:

G. Edward Bryan, BS '54 — 3 years
Dwight L. Carey, BS '72 — 3 years
Collis H. Holladay, Jr., BS '56 — 3 years
Charles H. Holland, BS '64 — 3 years
Rhonda L.MacDonald, BS '74 — 3 years
Adrian C. "Chip" Smith, Jr., BS '70 (Chapter representative; 1 year term)

Section 5.01 of the bylaws provides that members may make additional nominations for directors or officers by a petition signed by at least 50 regular members in good standing, providing the petition is received by the secretary no later than April 15. In accordance with section 5.02 of the bylaws, if no additional nominations are received by April 15, the secretary casts the unanimous vote of all regular members of the Association for the election of the candidates nominated by the board. Otherwise a letter ballot is required.

Below are the biographical summaries of those nominated for directors.

G. Edward Bryan

G. Edward Bryan (BS '54) is manager of software development at the Los Angeles Development Center of Honeywell, Inc. Bryan claims that he stayed on the same project for 17 years while the companies that he worked for rolled by. He joined Scientific Data Systems in 1967, a firm that later became Xerox Data Systems and still later a part of Honeywell.

Bryan credits Caltech with giving him his first management experience, when, as president of Dabney House, he stood by "helplessly" while others engineered the infamous heist of the F-84.

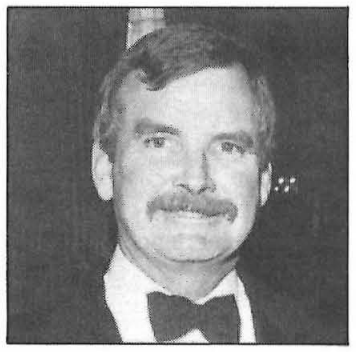
A life member of the Alumni Association, he is also one of the assistant scoutmasters of Troop 400 in Pacific Palisades.

Dwight L. Carey

A former Ricketts House president, Dwight L. Carey (BS '72) is manager of environmental affairs for Republic Geothermal, Inc., in Santa Fe Springs. He earned his MS degree in geology-geomorphology in 1976, and his Doctor of Environmental Science in 1982, both from UCLA.

A life member of the Alumni Association and a worker for the Alumni Fund, Carey is vice president of the UCLA Environmental Science and Engineering Society. He is active in the Yorba Linda YMCA, the Sierra Club, the Adult Soccer League, and the National Association of Environmental Professionals.

Collis H. Holladay, Jr.



Collis H. Holladay, Jr., (BS '56) has served as president, vice president, and treasurer of The Caltech Associates. He has been active for several years with the Alumni Fund.

Holladay received his BS degree in mechanical engineering and works in investment management. He lives in Newport Beach and San Marino. One of the volunteer directors for the National Society to Prevent Blindness, he is a board member of its southern California affiliate, and is a former vice president of the Combined Health Agencies Drive of Southern California.

Charles Holland, Jr.

Charles "Chuck" Holland, Jr., (BS '64), is vice president of corporate technology for Citibank and Citicorp, world-wide providers of banking and financial services. After graduating from Caltech, he continued with high energy physics research at UC San Diego and then moved into a staff position with the UCSD computer science department, before leaving for the corporate environment in 1972.

Holland has been a member of the Alumni Seminar Day Committee for five years and is a life member of the Alumni Association. He lives in Westlake Village, Thousand Oaks, where he is active in community and school organizations.

Rhonda L. MacDonald

Rhonda L. MacDonald (BS '74) is a principal engineer in the civil engineering department of C F Braun & Co. She joined the firm in 1975 and has been a structural design and analysis engineer on several large petrochemical projects, developing technical guides and computer programs with structural applications for the company.

After graduating from Caltech, she entered MIT and earned an MS degree in civil engineering in 1976. She currently is enrolled in the engineering management program at Caltech's Industrial Relations Center. Ms. MacDonald is a life member of the Alumni Association.

Adrian C. Smith, Jr.

Adrian C. ("Chip") Smith, Jr., (BS '70), went on to earn MS and PhD degrees in applied physics at Cornell University. He joined Pacific Gas and Electric Company in San Francisco in 1976. He is now an Assistant Program leader in the Beam Research Program with Lawrence Livermore Labs. He has served on federal panels to evaluate the U.S. National Fusion Program.

Smith teaches a course on plasma physics and thermonuclear fusion research at UC Berkeley, and is one of the editors of the book *Legends of Caltech*, about student pranks.

William Fowler: Seminar Day keynote speaker

William Fowler, 1983 Nobel laureate in physics, and Institute Professor of Physics Emeritus, will deliver the keynote address, "The Quest for the Origin of the Elements: Nobel Prize Lecture in Physics, 1983," at the general session of the Institute's Alumni Seminar Day, on May 19. He will conclude his talk with slides showing highlights of the Nobel award ceremonies in Stockholm.

Caltech's 47th Alumni Seminar Day will begin at 8:30 a.m., with registration in Dabney Lounge. The morning program will consist of a series of lectures by Caltech faculty, followed by a lunch break and free time to view exhibits. The afternoon general session will feature Fowler's speech, the presentation of Distinguished Alumni Awards, and additional faculty presentations.

All of the Institute's academic divisions will be represented in the day's lectures, with the following faculty scheduled to speak: Paul Patterson, Division of Biology; Sunney Chan and Peter Dervan, Division of Chemistry and Chemical Engineering; David Rutledge, Charles Seitz, and Stanley Baker, Division of Engineering and Applied Science; Judith Goodstein and Alan Schwartz, Division of the Humanities and Social Sciences.

Geoffrey Fox and Gary Lorden, Division of Physics, Mathematics and Astronomy; Peter Wyllie and Larry Soderblom, Division of Geological and Planetary Sciences; Charles Elachi, the Jet Propulsion Laboratory; and Michael Hoffmann, Environmental Quality Laboratory.

Caltech's biggest news story so far this year will also be the subject of a lecture — by undergraduates. After weeks of media publicity, seniors Dan Kegel (engineering and applied science) and Ted Williams (engineering and applied science, applied physics) will deliver a first-hand account of how they "won" the 1984 Rose Bowl.

At the close of the afternoon session, a wine and cheese reception will be held in Alumni House. The day's events will conclude with dinner in the Athenaeum and a Glee Club concert in Beckman Auditorium.

Alumni Association sets class reunion dates

Whatever happened to the Caltech class of 1929 . . . 1949 . . . 1974? The time to find out is this May and June when alumni who have graduated every five years since 1924 return to campus to find out how much they, their old friends, and alma mater have changed in the last five, ten, or sixty years.

The 25th anniversary of the class of 1959 will be the first reunion of the season. It is scheduled for May 18 and 19 to coincide with Seminar Day. All other reunion dates will accommodate several classes at once.

The classes of 1924, 1929, and 1934 will hold their reunions on June 2. The next reunion date will be June 8, for alumni who graduated in 1969, 1974, and 1979.

Graduates of the years 1939 and 1944 will be returning to campus on June 1.

The final reunion of the year will take place on June 9, for the classes of 1949, 1954, and 1964.

The Half-Century Club, at its June 2 meeting, will welcome inductees at a luncheon at the Huntington-Sheraton Hotel. Later in the day, the class will return to the Alumni House for a reception and buffet supper. Wives or guests, and alumni from earlier classes, are invited.

Most of the other class reunions will follow a traditional format, with campus tours at 4 p.m., followed by social hours at the Alumni House or Athenaeum, and dinner in the Athenaeum.

Women's swim team fourth in conference

Continued from page 7

had to do and she surpassed that. This was a total team effort."

Outstanding in diving were Michelle Mahowald, who placed third in the one-meter, and Faye Flam, who placed second on the three-meter. Senior Clare Stassen, who won both the one- and three-meter events, did an outstanding job.

Sprints were handled by Faan Tone Liu (27.81 in the 50 free) and Christie Cooper (26.15 in the same event). Cooper failed by only .76 of a second to qualify for the nationals. Clea Bures did well as a backstroker, while Lisa Henderson swam breaststroke events and Nancy Drehwing performed well in the fly.

Faculty-student conference probes wide-ranging issues

Curriculum changes in chemistry and in the humanities and social sciences, help for students who want to transfer out of Caltech, relationships between graduates and undergraduates, and additional funding for the Summer Undergraduate Research Fellowship program (SURF) were the principal topics at Caltech's third faculty-student conference on February 24.

More than 100 faculty members and graduate and undergraduate students attended the morning meeting on campus to hear proposals and exchange opinions on these issues, and to hear a report by Geoffrey Fox, dean for educational computing, about Caltech's new computer project. James J. Morgan, vice president for student affairs, was conference moderator.

Discussions were led by student-faculty panels whose members had researched the issues before the conference. After panel members presented their findings, the floor was opened for comments.

The two most controversial areas concerned aspects of the humanities and social sciences program, and the Institute's transfer system. Many students endorsed the idea of writing classes or labs within the humanities to give students additional help in improving expository and technical composition skills, and some suggested that the range of social science courses be broadened.

There was general agreement that students who are not doing well at the Institute and who want to leave should be identified and counseled before poor grades jeopardize their chances of acceptance at other good, if less demanding, institutions. It was proposed that a formal administrative position be established to handle this problem.

As they had done during the 1982 conference, the chemistry panel members advocated enlarging the division's introductory course to increase students' understanding of course material. The committee on graduate-undergraduate relations focused on ways to improve social interaction between the two groups and recommended modifications in the TA system.

The conference adjourned after discussions of how to raise funds for the unanimously praised SURF program, and a presentation by Fox on computing opportunities at Caltech. Students, faculty, and administrators agreed to follow up on the issues raised at the meeting.

Professor Emeritus Henry Borsook dies

Henry Borsook, 87, professor of biochemistry, emeritus, died March 4, in Santa Barbara. Borsook was born in 1897 in London, England, and came with his parents to Toronto, Canada, in 1907. He received his BA, MA, MB, PhD, and MD degrees from the University of Toronto.

Borsook, who was noted for his work in protein synthesis and for his contributions to nutrition, came to Caltech in 1929 as assistant professor of biochemistry and was named full professor in 1935. After his retirement from the Institute, he continued his research at UC Berkeley until 1978.

During World War II, Borsook was a member of the War Food Administration and the War Production Boards, and was the developer of a multipurpose food, utilizing soybean protein, designed to feed starving populations in the post-war world. He was a co-founder of Meals for Millions, a nonprofit organization founded to further the use of the food.

He is survived by his wife, Lisl, of Santa Barbara, and a daughter, Eva Borsook, of Florence, Italy.

Robert McEliece elected Fellow of IEEE

Robert J. McEliece, professor of electrical engineering at Caltech, has been elected a Fellow by the board of directors of the Institute of Electrical and Electronic Engineers. This honor goes each year to individuals who have shown outstanding achievement in electronics or electrical and computer engineering. In honoring McEliece, the board cited his major "contributions to information and coding theory, research and applications."

Case continued against Rose Bowl scoreboard pranksters

At a hearing on January 31, Pasadena's case against two Caltech students who rigged the scoreboard at the 1984 Rose Bowl game was continued for two months to allow a settlement to be reached.

Under discussion has been a probationary period and performance of community services to the city. One of these would be to have the students, Dan Kegel and Ted Williams, design and install systems that would protect the Rose Bowl, its scoreboard and power systems, against similar intrusions in the future.

The students were charged with misdemeanors including interfering with electrical wiring, trespassing, malicious mischief, and loitering in the Rose Bowl at night. Each charge carries a maximum penalty of a $1,000 fine and a year in County Jail. City officials have asserted that it will take $4,200 to repair damage to the scoreboard and public address system. Kegel and Williams have claimed they could not have done that much damage when they installed a radio-controlled microprocessor into the scoreboard controls.

The students changed the scoreboard during the last quarter of the UCLA-Illinois game to read: "Caltech 38, MIT 9."

San Diego votes light pollution protection for Palomar

Continued from page 1

Branigan cited media coverage and letters from science, business, and government leaders, as well as the economic and energy-efficient advantages of LPS, as key factors in the decision.

The council's June 1983 vote to adopt a HPS lighting policy was the subject of numerous media stories and editorials as San Diego newspapers and television stations and national magazines adopted editorial positions in favor of LPS lights to save Palomar.

12 reunion classes set $278,000 as goal for gifts for Institute

More than $160,000 in unrestricted funds for the Institute has been contributed by alumni of 12 classes holding reunions in June, according to Gordon Barienbrock (BS '58), chairman of the Reunion Gifts Program.

This is the first year that all 12 reunion classes have participated in a gifts program. Their combined goal is $278,000.

During the year, volunteers have been working from their homes, calling classmates throughout the country to seek their support. Each class will present a check as its gift at its reunion.

Members of the committee are: William L. Holladay, class of 1924; Fred A. Wheeler, 1929; George Housner, 1934; Jack H. Goodell, 1939; Tway W. Andrews, 1944; Hugh C. Carter, 1949; Reinaldo Gutierrez, 1954; Allan R. Porush, 1959; David Holtz, 1964; Peter W. Beckman, 1974; Steve Toner, 1979.

Prospective freshmen entertained by Alumni Association

Three receptions this spring for prospective Caltech freshmen have been the focus of the Undergraduate Admissions Support Committee of the Alumni Association.

The committee, whose chairman is Gregory P. Stone (BS '74, MS '74), works with the Caltech Admissions Office and the Freshman Admissions Committee to encourage talented and qualified students to come to Caltech.

A reception for southern California students admitted to the Institute, and for their parents, will be held at the Alumni House on April 21. Guests will tour the campus and return to the Alumni House for informal discussions with faculty and staff, alumni and undergraduates.

On March 18, in Washington, D.C., and in the Bay Area, students and parents attended receptions sponsored by the committee. These events focused on undergraduate life at Caltech, with slide shows and question-and-answer sessions. Lisa Heinz, BS '78, was coordinator for the Washington program; Adrian C. (Chip) Smith, Jr. (BS '70), showed slides and coordinated in San Francisco.

During the year, members of the committee also work with Caltech admissions personnel by talking, on an individual basis, about the Institute with prospective students and with high school principals and counselors who live in their areas.

OBITUARIES

1921
ARTHUR L. KLEIN, MS '24, PhD '25, on November 25, 1983. He had been professor of aeronautics, emeritus, at Caltech. He is survived by three children.

1934
RUDOLF VON HUENE, in April. He had been the owner of the Rudolf Von Huene Thinsection Laboratory in Pasadena. His wife survives him.

1935
RICHARD H. JAHNS, PhD '43, on December 31, 1983, at his Menlo Park, California, home, following a massive heart attack. He had been emeritus dean of the Stanford School of Earth Sciences and a nationally known expert on earthquakes. Jahns began his distinguished career in 1937, when he joined the U.S. Geological Survey, rising to senior geologist in 1948. He joined the Caltech faculty in 1949 as professor of geology, and left in 1960 to accept the position of chairman of the Division of Earth Sciences at Penn State. In 1965, he came to Stanford as professor of geology. Jahns was the recipient of Caltech's Distinguished Alumnus Award in 1970. Other honors included the Distinguished Achievement Award of the American Federation of Mineral Societies, the Ian Campbell Medal of the American Geological Institute, and the Public Service Award of the American Association of Petroleum Geologists. In 1978, he was elected president of the California Academy of Sciences. Everywhere he taught, Jahns won a reputation as a dynamic, stimulating lecturer who delighted his classes with his wit and fondness for extracurricular practical jokes. Among his students were astronauts Alan Shepard and Edgar Mitchell, who received special training from Jahns at NASA to sharpen their observations of lunar geology. Dr. Jahns is survived by his wife, Frances, two children, and one grandchild. The family has requested that memorial contributions be sent to the Stanford School of Earth Sciences.

1941
ROBERT KINGSMILL in August 1983. He had been president of Gilbert & Stearns Inc. in Santa Ana, California.

1945
CHARLES LEVY, Eng, in May 1983. He had been resident specialist with the Lockheed Missiles & Space Company in Sunnyvale, California.

WARREN M. MARSHALL III, BS '48, on November 25, 1983, while on vacation in New Zealand. He had been with Shell Oil for 35 years, most recently as division exploration engineer. He is survived by his wife, Carol, and three children.

Obituaries correction

The Obituaries section of December *Caltech News* incorrectly listed the name of the widow of George A. Feigen, PhD '48. Mrs. Feigen's name is Priscilla Roth Feigen, not Ruth Feigen, as it appeared. We regret the error.

PERSONALS

1922
HAROLD R. HARRIS, Brigadier General, Retired, with the U.S. Air Force, has been presented with the Air Force Institute of Technology's Distinguished Graduate Award for 1983, in recognition of his contributions to the nation and to the advancement of aviation. The medallion he received had previously been carried into space aboard the space shuttle *Columbia*.

1926
JOHN R. HOWELL, now retired from Sterling Electric in Los Angeles, writes that "Agnes, my loving wife for 52 years and enthusiastic civic leader, passed away to be with Jesus in June 1983."

1931
SAM EASTMAN, president of Dozier, Eastman & Co., and his wife recently returned to their home in La Habra Hills, California, from a lengthy trip around the world. Eschewing conventional hotel arrangements and tour guides, they visited the major European capitals but were far more impressed by the "lush" beauty of Singapore and the unexpectedly high standard of living they found there. Their itinerary also included "beautiful, bountiful, berserk" Sri Lanka, Australia, New Zealand, and Hawaii. "Overall," they report, "a fabulous trip with no problems along the way. And no problems driving on the 'wrong' side of the road!"

1932
MAURICE A. BIOT, PhD, an independent consultant in Brussels, Belgium, has been elected honorary fellow of the Acoustical Society of America. He is the tenth person to be so honored since the election of Thomas Edison in 1929.

1934
KENNETH A. WILLARD, MS, MS '35, who retired from Lockheed in 1977, is enjoying a second career as a writer and consultant on aviation activities in Los Altos, California. He writes, "Keeping busy designing radio-controlled aircraft, writing articles, and occasionally consulting. New book, *Big Fun with Little Engines*, is due out in spring 1984."

1939
MARK G. FOSTER, PhD, professor emeritus of electrical engineering at the University of Virginia, writes, "My wife and I are now finally settled in a life-care center, where the infirmities of age can be taken care of in-house. We find it colorful and warm. Letters and/or visits from Caltech friends/acquaintances will receive a hearty and unaffected welcome." The Fosters live at 2455 Tamarack Trail, Apt. 22, Bloomington, Indiana, 47401.

1940
ROBERT WAYMAN, vice president for advanced transmission engineering with the Borg-Warner Corporation, has been in Sydney, Australia, since 1982, overseeing the firm's development of a new automotive transmission system. He expects to remain Down Under through much of 1984, taking advantage of his leisure time and pilot's license to tour the region with his wife, Laurine. They write, "The year has been eventful with trips to New Zealand's South Island's lush beauty spots and to Australia's dry center at Alice Springs and nearby Ayers Rock. In our plane, visits were made to the 'outback,' to Melbourne and to the Gold Coast, near Brisbane. Being able to see this part of the world was and is a great attraction of this Australian assignment."

1944
CLIFFORD I. CUMMINGS reports that after 20 years with Xerox Corporation, he has retired, effective July 1983, and will be joining JPL as manager of the East Coast Defense Programs Office in McLean, Virginia. Before joining Xerox, he worked many years at JPL and looks forward to renewing the association.

1950
HARVEY J. AMSTER and his wife announce the birth of their daughter, Heidi Jane, on December 12, 1982. Her father adds, "I am younger than most others in my graduating class."

1951
RONALD T. CALDWELL, senior engineering specialist with Garrett Turbine Engineering Co. in Phoenix, Arizona, reports that he married Emma Wiltsey on May 3, 1983.

1954
ED GAUSS writes from Lincroft, New Jersey, that he has been elected as exhibiting sculptor at the Guild of Creative Art in New Jersey. He is interested in hearing from anyone who remembers the art classes that were held Saturday mornings in the Arms basement about 1953. Retired last year from the faculty of the University of Alaska, where he was a professor of computer science, Gauss, when not pouring bronze, is a member of the technical staff of AT&T's Enhanced Network Services — one of the splinters of Bell Labs.

1956
ROBERT L. SHACKLETT, PhD, writes from Newark, California, "I am the executive director of the Foundation for Mind-Being Research, a non-profit organization interested in facilitating the development and recognition of the new field of the mind sciences. As a physicist, I am exploring the interdisciplinary area of consciousness studies with a particular emphasis on how quantum physics can be used to develop models of perception. I give lectures, seminars, and workshops on topics related to the 'physics of consciousness.' "

1959
PHILIP BROMBERG, MS, writes from Pittsburgh, "I am now a practicing attorney. My book, *Clean Air Act Manual*, was just published by Government Institutes of Washington, D.C."

JOHN RICE, PhD, professor of mathematics and computer sciences at Purdue University, has been appointed chairman of the department of computer sciences. He joined the Purdue faculty in 1964.

ROBERT E. ZARTMAN, MS, PhD '63, reports from Denver, where he is a geologist with the U.S. Geological Survey, "I have served the last 2½ years as chief, branch of isotope geology. Looking forward to a return to full-time research in isotope geochemistry at the conclusion of my administrative tour of duty."

1961
GEORGE W. SIMON, MS, PhD '63, senior scientist in space physics with the Air Force Geophysics Laboratory in Sunspot, New Mexico, is the 1983 recipient of the Guenter Loeser award. The award, which annually honors an AFGL scientist for an outstanding body of research, cites Dr. Simon for discoveries concerning the sun's atmosphere and solar magnetism that have proven to be among the most significant findings in solar astronomy during the past 50 years.

1963
ROBERT A. RIDLEY PARKER, PhD, NASA astronomer and astronaut, was one of two mission specialists aboard the space shuttle *Columbia* during its November-December 1983 flight. He participated in numerous experiments involving eye motions, blood cell ratios, and weightlessness, and was highly praised for his hands-on ingenuity when sophisticated technology aboard the craft malfunctioned. Parker also carried aloft a 17th century astrolabe, a navigational instrument dating back to the ancient Greeks. The device was donated by the Mount Wilson Observatory, where Parker spent many hours as a Caltech graduate student.

1965
JAMES F. YEE, member of the technical staff with Aerojet Electrical Systems, was one of three Asuza, California, employees to receive the Robert B. Young award for advances in electronics. The honor went to Yee for co-developing an innovative infrared detector for satellite surveillance systems.

1967
MARK A. SATTERTHWAITE has been named the Earl Dean Howard Professor of Managerial Economics at the Kellogg Graduate School of Management at Northwestern University. He joined the Northwestern faculty in 1972.

1969
MICHAEL R. BEAVER announces the birth of a daughter, Susan Michelle, on December 16, 1983, and a promotion to process development manager for Zymas Corporation in Sunnyvale, California.

1970
REUBEN EPSTEIN, scientist with the Laboratory for Laser Energetics at the University of Rochester, and his wife, Jody, announce the birth of their third child and first daughter, Chloe Beth, on October 17, 1983. Jody is a sales representative for a custom packaging firm.

BRUCE D. WEINSTEIN, PhD, has been promoted to professor of physics at the University of Chicago as of April 1983. His wife is a vice president at the First National Bank of Chicago, while their son, Keith, is a preschooler.

1971
ANDREW ODLYZKO, MS '71, member of the technical staff with Bell Laboratories in Murray Hill, New Jersey, has come to national attention for disproving the Merten Conjecture, a fundamental tenet of higher mathematics that has been accepted as true for nearly one hundred years. Using fast computers and improved testing methods, he and Herman te Riele of the Center for Mathematics and Computer Science in Amsterdam have demonstrated that the conjecture, long known to be true for the first ten billion whole numbers, is false for subsequent integers through infinity. Their finding has important consequences for several fields of study, including number theory and algebra. Of his discovery, the *Los Angeles Times* quotes Odlyzko as remarking, "It just shows you again that you have to be very careful."

1973
ERIC M. BLECK writes, "In June 1978, I received my PhD in nuclear physics from Duke University. We then moved to Albuquerque, where I work at Sandia Labs in the weapons systems organization. My wife of 7½ years, Donna, and I welcomed our first child, Brian, in September 1981, and are expecting our second child in April."

TOMAS GANZ, MS, PhD '76, has been appointed assistant professor in the department of medicine, UCLA, in the Division of Pulmonary Medicine. He writes, "I'm doing research on lung macrophages — specifically their role in host defense against infections and mechanisms by which macrophages destroy invaders. My wife, Patti, and I have two children, David, 8, and Rebecca, 4, who are our pride and joy."

PAUL H. YANCEY, assistant professor of biology at Whitman College, Walla Walla, Washington, and his wife announce the birth of their first child, Ross, on April 12, 1983.

1975
STEVE AND BRENDA ALEY write from their Silver Springs, Maryland, home, "We are writing to enquire if you know the whereabouts of KENT NAKAMOTO. (It is getting near time to settle up a bet dating back to our undergraduate days on whether or not he'd be married by now.) We seem to have settled down in the Washington, D.C., area. Brenda is a software engineer with Intermetrics, and Steve is a staff fellow working on malaria at the laboratory of parasitic diseases, National Institutes of Health. The family has grown to include two young boys, Eric, who is now 2½, and Daniel, who was born last September. Together they seem to have made the term 'free time' just about obsolete."

RONALD S. CARSON reports from Redondo Beach, "Completed my PhD in nuclear engineering (finally!) at U of Washington in Seattle last April. I'm now working as a systems analyst in the Energy Technology Division of TRW, and work closely with ED FLANDERS (PhD, 1981). TRW is a great company to work for (and much better than grad school). My wife, Merrie, a native Seattleite, is getting used to the southern California lifestyle."

KATHRYN D. CROSSLAND writes from Brookline, Massachusetts, "I married Andrew Bronstein (MIT alumnus) on October 8, 1983. In June 1984, I will receive my MD degree from Harvard Medical School, then start a residency in internal medicine."

BILL O'MEARA, reports from Seattle, "My five-year programming career is on hold now that my inherited epilepsy has worsened over the past year. My first "grand mal" came this summer — while I was driving home. Three cars totaled, but nobody was injured. On the brighter side, my latest stereo system (1 kilowatt RMS pink noise 8 hours continuous rating — for all you EE's) is just great for 'Ride' playings!"

1976
ERNIE TANGREN, MS, Eng '78, writes from Syosset, New York, "I'm proud to announce an achievement in my hobby of travel. This past year, instead of aimlessly wandering about the world, I set and completed a goal to see the 'Seven Wonders of the World.' Only one of the original seven remains standing. So, I followed a modernized list and over the past year have visited the pyramids, Hagia Sophia, Stonehenge, Roman Colosseum, Great Wall of China, Taj Mahal, and the Houston Astrodome."

1977
JOHN ERNEST, chemical engineer with JPL, and his wife, Sue, announce the birth of their first child, Laura Elizabeth, on October 2. "She's curious, healthy, and beautiful."

CHRISTOPHER E. JENSEN, and his wife, Linda Taylan, send us the news of the birth of their second child and first son, Jonathan David, on December 20, 1983.

ROGER P. STOUT, MS '79, writes that his second child and first son, Matthew Paul, was born December 14, 1983. He adds, "I am now a registered P.E. (mechanical) in the state of Arizona, and a senior staff engineer on Motorola's technical ladder at the ripe old age of 27."

1980
JIM FRUCHTERMAN, MS, writes from Santa Clara, California, "I have moved from rockets into electronics in the past two years, by co-founding the Palantir Corporation. We have gotten two rounds of venture capital (several million dollars) to develop a very innovative computer peripheral. We need top-notch people to join us in Santa Clara."

ROBERT E. McCARTHY III, engineer with McCarthy Tank and Steel Company, and his wife, Judi, announce the birth of Robert Edwin McCarthy IV, born October 20, 1982.

1982
THOMAS P. BAUER, PhD, member of the technical staff with Aerospace Corporation in El Segundo, California, and wife, Dona, announce the birth of their first child, Scott, born in January 1983.

BERND TREBITZ, PhD, is now assistant director of research at Braun, a division of Gillette, in Kronberg, West Germany.

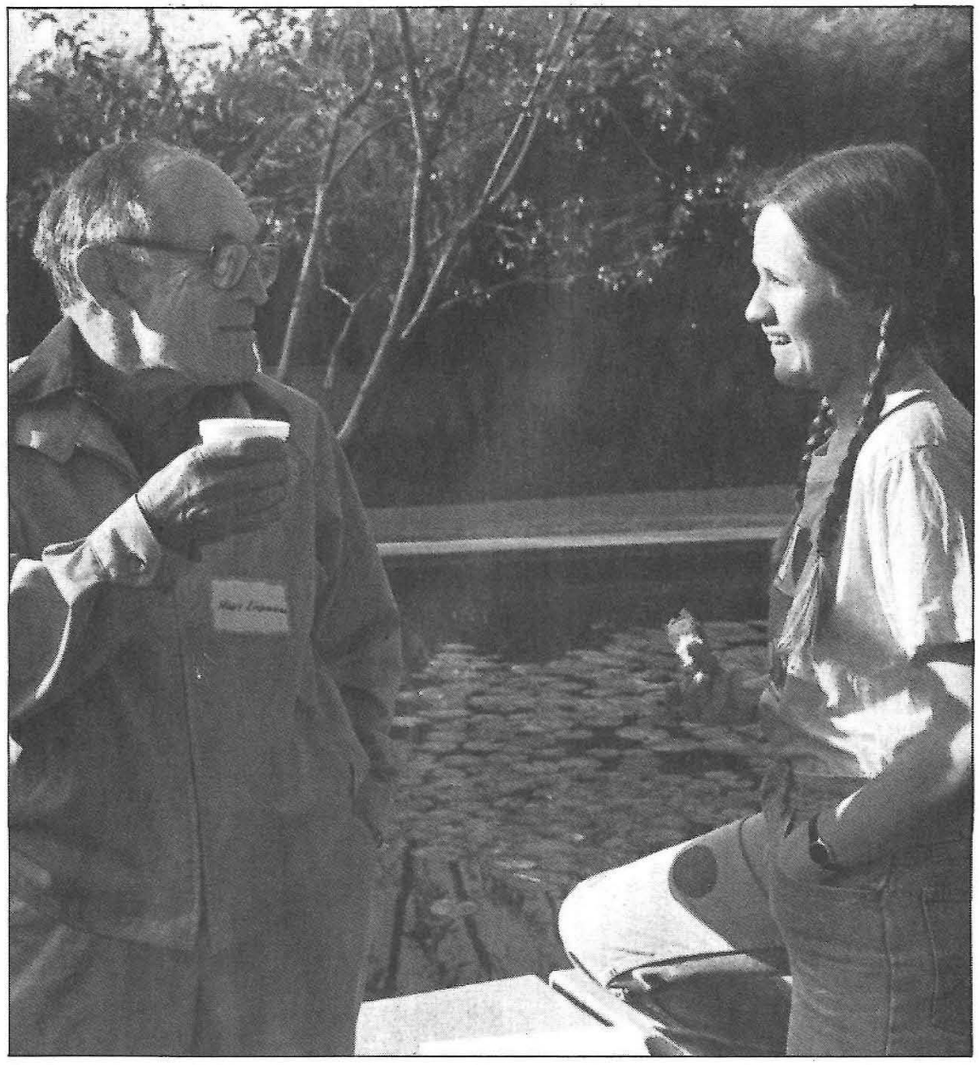
An updated logo made its appearance at Caltech early this year. The latest design evolved from a number of earlier versions — the first of which was created in 1968. It replaces three versions of that logo that have been used concurrently, and thus have become confusing to the public. The logo was designed to reflect the best of modern graphics, but also to have ties with the past emblems.

CALTECH NEWS

California Institute of Technology
1201 E. California Boulevard
Pasadena, California 91125

Published for Alumni and Friends of the
California Institute of Technology
Volume 18, No. 2, April 1984

CALTECH NEWS



Caltech's third faculty-student conference drew more than one hundred participants to discuss issues involving academics and student life. Above: At a conference break, Hans W. Liepmann (the Theodore Von Kármán Professor of Aeronautics) talks with Karla Peterson, a junior majoring in applied physics.

April 1984