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Students Take Their Academic Enthusiasms Back to School

Last January a few Caltech students decided to investigate the possibilities of teaching mathematics and science in public schools. Mike Garet, a senior mathematics major, suggested to faculty and administration at Woodrow Wilson Junior-Senior High School in East Los Angeles that he and a few colleagues bring some experimental math teaching ideas to a group of seventh and eighth graders; Garet received immediate cooperation. At the same time senior Gregg Wright and junior Bob Brackenbury, Caltech biology students, got permission to start science classes for fifth and sixth graders at Cleveland Elementary School in Pasadena. The students at Wilson are mostly Mexican-American; those at Cleveland are predominantly black.

The students working on these two

INSIDE	- 21
►Eye's right for Palomar	Page 2
The high school crowd checks out the Institute	Page 3
►New facilities for talking to yourself	Page 4
►Campus nightlife—something for everyone	Page 4
►Big splash at George Williams	Page 5
►Alumnus in search of dark days	Page 6
►Group greets grapes. Great!	Page 7

parts of the blooming ASCIT Research Center education project base their teaching on the ideas of William Johntz, a young Berkeley mathematician, whose method has made it possible for children to learn abstract math at nearly any grade level. The California legislature voted funds for its inclusion in the curriculum of elementary public schools, where it is known as the Miller Mathematics Program. Johntz calls the process the discovery method, since the children learn through their own curiosity and interest rather than through teacher-centered, structured lessons. He gave an afternoon of demonstrations at Caltech last fall to a large group of students and faculty, successfully working with some fourth-grade students he had never seen before.

Wright and Brackenbury agree with Johntz that the method is as successful with science as with mathematics. And the Caltech students teaching math and science point out in praise of Johntz' method that remedial programs often fail because they emphasize areas where children have already done miserably.

Garet and a fellow senior math major, Dan Nemzer, reported early what the other ARC student teachers have corroborated: that the young people they have been teaching are amazingly insightful. They ask good questions and show marked creative ability when they are in a relaxed situation where ideas can flow freely. The youngsters, mostly low achievers, evince deep anxieties when they think they are faced with tests, *Continued on page 3*



October 29, 1909: Throop Hall being built—"Common and good construction for its day."

Throop Hall: OK For Now

Something is going to be done to Throop Hall. When, what, and financed by whom are unknowns. Caltech's administration building, oldest structure on the campus, is of questionable integrity in case of a large earthquake. A report made for the trustees' buildings and grounds committee by a team of structural engineers-including Caltech's own expert George Housner, professor of civil engineering and applied mechanicsconcluded that walls of the 59-year-old building could be expected to crack and shatter in the event of a major shock. However, it noted that Throop's structure is as sound as at any time during its 59 years of existence, during which it has never experienced any damage in the numerous earthquakes which have taken place in California.

The trustees deferred any immediate action on the report. According to Ted Combs, secretary to the board, they con-

Webbs and Dabney Men Like Married RA Scheme

To bring life in the Caltech monastery closer to the exterior world was one of Robert Huttenback's goals as Master of Student Houses. One real-world touch he visualized was a married couple living in an undergraduate student house and acting as the Resident Associates. The RA, in times past often a bachelor professor, now a graduate student or postdoctoral fellow, wears a "housemother" cloak of vague outlines. Huttenback thought the right woman as part of an RA team could be a normalizing influence on house life.

In the spring of 1968 he finally pushed the idea through. The administration and the faculty committee on undergraduate student housing agreed to his suggestion that an apartment be created in Dabney House out of the RA's suite and an ad-*Continued on page 4* sider the building safe for occupancy for the time being. Throop's eventual fate is being studied as part of a current overall campus utilization and renewal study being conducted by the Campus Architect.

It would cost approximately \$2.5 million (1969 dollars) to renovate the building and bring it up to current building standards, says Campus Architect Royal Tyson; a new building could be constructed for about the same amount of money.

But at a time when some Caltech support is being cut back (down \$566,000 in federal research funds alone in the 12 months ending February 28, 1969) and costs are increasing (up \$407,000 for the first half of fiscal 1969), the trustees are natually reluctant to consider a \$2.5 million expenditure that would not provide any significant upgrading of research or instruction.

Occupancy of Throop Hall is going to change, with about two-thirds of its population scheduled to move out and into the new Business Services building this summer. Remaining in Throop on the lower two floors will be offices of the trustees, president, vice presidents, provost, deans, registrar, alumni, industrial associates, public relations, placement, and publications, and a costly telephone central installation. It is possible that the upper two floors will remain largely unoccupied after June.

For a building of its age, Throop is in surprisingly good condition and, as pointed out, presents no hazard except under conditions of an earthquake very much stronger than those it has already withstood in its 59 years. The building's construction, says architect Tyson, was common and good for its day. Ironically, standards for modern earthquake-resistant construction, which Throop doesn't meet, derive in large part from work done by Caltech's geologists and engineers over the last 35 years.



John and Sandy Webb, the first married couple to act as student house resident associates.

Palomar Gets Ready To Install a New Telescope

Palomar's newest telescope, a 60-inch photometric reflector, is expected to be fully operational by early 1970. The first major addition to equipment at Mount Wilson and Palomar Observatories since installation in 1948 of the 200-inch Hale telescope, the new instrument, in tandem with the 48-inch schmidt camera, will free the giant for more of the special far-ranging observations for which it was designed.

The telescope will be located atop a knoll about one-half mile southeast of the Hale telescope. The three-story height of the structure provides desirable optical "seeing," placing the telescope axes' intersection 30 feet above ground level. The two floors below the observing floor contain darkrooms for developing plates, mirror-handling facilities, instrumentation and control equipment, and a combination office-library-photographic assessment room.

Special concrete piers to hold the massive tube's supporting frames extend to foundation depth. Insulated double walls and an air conditioning system will maintain optimum temperature and humidity.

The same construction and air conditioning are included in the building extension for the 20-foot high coudé instrument, used for spectroscopic studies during moonlight periods too bright for direct photography and critical photoelectric work. Already installed in the coudé room, the base of the separate coudé equipment was lifted into place by hydraulic crane before the roof was installed. All other telescope machinery will be placed after completion of the dome structure, by lifting through the



Mt. Wilson and Palomar Observatories photo

The building to house the 60-inch telescope is taking form at Palomar (right), although work was delayed a few weeks by the wet winter. The mirror (above, shown during early rough grinding in 1967) is being finished in the Pasadena optical shop of the Observatories.

Central Engineering Services photo

shutter opening.

Rails for rotation of the steel dome are in place and being finish-ground. Work on the dome steel was completed in March, and the rotating dome is now being erected.

Construction of the building to house the new telescope is only one part of the \$1-million job. Also involved are the 60inch mirror, and the telescope tube and mounting with control and drive mechanisms and instrumentation.

The fused-silica primary mirror blank has already been edge-ground and given rough-contour preparation in the Optical Shop of the Mount Wilson and Palomar Observatories headquarters in Pasadena. Final figuring and polishing will continue there until late this fall.

After it is coated with highly reflective aluminum, the 60-inch primary mirror will be ready for placement within the mirror cell.



The slightly conical closed steel telescope tube and mounting were tested the last week in February at Caltech. Mechanical performance was satisfactory, indicating only such minor adjustments as could be made at Palomar during final installation of the equipment. Now dismantled, the pieces of machinery are under preparation for transportation to the site, to be stored under cover until needed for erection.

The new reflector will be used generally for photoelectric observations of brighter objects than those to be observed by the more ponderous 200-inch telescope. Design attention was concentrated on ways to permit rapid shifts from one setting to another. One result was a short tube, only 13 feet long; mirrors extend its focal length to that of a longer instrument.

Costs of construction of the three-story building have been pledged to Caltech by

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the family of the late Oscar G. Mayer. The building will be named for the Wisconsin meat packer. In addition to the gift to Caltech of

the Mayer building, funds for the new equipment came from several sources. A \$590,000 grant for materials and construction of the telescope came from the National Science Foundation to the Carnegie Institution of Washington, co-operator with Caltech of the Mount Wilson and Palomar Observatories. Preliminary design studies and purchase of the mirror blank from Corning Glass Works were cleared by \$125,000 from the National Aeronautics and Space Administration. Carnegie added \$74,000, and Caltech \$20,000.

All construction work is scheduled for completion by July 1969. Check-out tests for mechanical adjustments will be done before placement of the mirror late in the year.

LETTER

Editor:

Though I realize that this was a view that was merely reported by Caltech News (Vol. 3, No. 2), I couldn't let the statements "Excellence, they claim, is an unknown word on black college campuses. Intellectual stimulation is virtually nonexistent." pass without comment. This is not the case at Morehouse College, as anyone aware of the situation on our campus can tell you; unfortunately, many people lump all predominantly Black colleges together, which makes about as much sense as putting Caltech and Berry College (which are both predominantly white) in the same bag. Such inaccuracy, when circulated by the news media, only helps to perpetuate the falsehood and to reinforce racist attitudes, conscious and unconscious. I hope that your reporters and editors will be more careful and less indiscriminate in the future.

> Alan Farley, '57, Chairman Department of Mathematics

ALUMNI SEMINAR PROGRAM ON PAGE 7

Visiting Commitees Go To Work

A new approach to communication among Caltech faculty, trustees, and professional and business leaders was launched at the Institute this spring. Six Visiting Committees-one for each of Caltech's six divisions-have been appointed to engage in frank, meaningful discussions of the Institute's programs and academic goals.

One group-the Visiting Committee for Biology-held its first meeting in March. During the meeting the division chairman, Robert Sinsheimer, reported on current activities in the division in education, research, and administration, plus any difficulties encountered in implementing plans. Committee members expressed their views on these, offered information about experience elsewhere, and suggested areas or emphasis not included in present planning.

Each committee consists of at least nine members, including trustees, alumni, and non-alumni. Trustee members are appointed by the chairman of the board of trustees, and a trustee serves as chairman of the committee. Other members of the group—who serve three-year terms -are selected by the faculty, Provost, and President on the basis of competence in their professional fields.

Normally, each committee will spend one or two days a year in session on the campus. Additional meetings may be arranged, and members are encouraged to visit the Institute for personal discussions with division chairmen, faculty members, and staff.

President Harold Brown, outlining the goals of the committee program, said: "Our teaching and research activities must be reviewed continuously to ensure that they keep pace with advances in science and engineering; with the changing tastes, needs, and capacities of our students; and with the changing requirements of our society.

"We believe the time has come when this process of continuous review at Caltech can be enhanced by seeking the advice of outstanding individuals in industry, education, and government-individuals who themselves cope with major changes and, indeed, who have a hand in bringing them about."

Alumni members on committees include:

Biology-Alfred G. Knudson Jr., '44, PhD '56, professor of medicine, State University of New York at Stony Brook; Dean Nichols, MD, '37, consulting radiologist, Phoenix, Ariz.; and Armin Dale Kaiser, PhD '55, professor of biochemistry, Stanford University Medical School.

Chemistry and Chemical Engineering -John A. Leermakers, PhD '32, vice president, Eastman Kodak Co., Rochester, N.Y.; and William N. Lipscomb Jr., PhD '46, professor of chemistry, Harvard University.

Physics, Mathematics and Astronomy -John G. Case, '27, consulting engineer, John G. Case & Associates, Beverly Hills; Ruben F. Mettler, '44, PhD '49, executive

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Associate Editor: Janet Lansburgh

vice president, assistant president, TRW Inc., Redondo Beach; Wolfgang K. H. Panofsky, '42, director, Stanford University Linear Accelerator Center.

Geological Sciences-Rollin Eckis, MS '30, executive vice president, international division, Atlantic Richfield Co.; H. W. Menard, '42, professor of geology, University of California, San Diego, Scripps Institution of Oceanography; John R. Rubel, '42, senior vice president, Litton Industries, Beverly Hills.

Humanities-Frank Capra, '18, Red Mountain Ranch Inc., Fallbrook, Calif.; J. Stanley Johnson, '33, Altadena.

Engineering and Applied Science-Louis T. Rader, PhD '38, vice president, General Electric Co., Charlottsville, Va.; Simon Ramo, PhD '36, vice chairman of the board, TRW Inc., Redondo Beach; Edward E. Tuttle, '28, president, Essick Investment Co., Los Angeles; Abe M. Zarem, PhD '44, vice president, director of corporate relations, Xerox Corp., Beverly Hills.

CALTECH NEWS

Back to School

Continued from page 1

grades, and the awful possibility of giving a wrong answer.

Garet and Nemzer found it essential that their students be physically and visually involved in whatever math situation was presented. Nemzer taught them the essentials of topology by having them make simple paper rings, which started them thinking about surfaces. When they cut the rings different ways, they could understand how surfaces can change. While Nemzer was introducing them to some topology, Garet dealt with simple concepts of logic.

"The kids started realizing the importance of arithmetic as a basic learning tool-but only after we took off the old pressures of 'right' answers, tests, and grades," Garet said. "Hardly any of them had any idea of the uses of arithmetic. Hardly any of them can multiply."

Hardly any of them had any idea of the uses of arithmetic

Garet and Nemzer started out with 30 students every Wednesday morning during first and second periods. Fifteen other Caltech students and Research Center Associates observed, and some of these have now started teaching classes too. Meanwhile, senior Garet has turned over the planning and leadership duties connected with the ARC Wilson group to Eric Schiff, a sophomore. From their experience at Wilson, those polled agreed that perhaps the old basic teaching ideas should be turned around. Based on what they have seen, they wonder if learning might not have come easier to many of the pupils if-from grades one through six-they had started doing what interested them and had their creativity encouraged, instead of all being graded by standards they cannot, in many cases, meet.

Mike Garet said the group has had excellent rapport with the Wilson mathematics teachers, who have many frustrations regarding the present educational system, especially as it applies to minority-group youngsters. They are willing to try anything that might put some enthusiasm and motivation into the pupils.

The third graders have been "reading" Scientific American

"Some of them have told us," said Garet, "that although there is a lot of research into new and improved teaching methods, the research is useless to them because there seems to be little or no way to put it into the curriculum."

Garet added: "We aren't saying we

a-week proposition. They have made water-drop microscopes that they use regularly. The third graders have been "reading" issues of Scientific American. When they see pictures that interest them, they are encouraged to ask every question they can think of. From this generally comes a learning process that carries their interest forward.

Wright had few thoughts about childhood education until he read two books last summer: Death at an Early Age, an account of the inferior educations black children receive in Boston; and Why Children Fail. These stimulated him to try some teaching methods of his own. Although he plans to enter medical school next year, he now feels that teaching the young will be an important part of any career he may choose. The broader purpose of the ASCIT education project, says Garet, is to investigate the role of college students in public education, "because the best source of information concerning education is firsthand. The difference between reading about education and facing a class of 30 children is beyond description. We feel it's important that more of us have this experience."

At a time when many thoughtful Caltech faculty members and students are considering the quality of education on the campus, the students working in the ARC project stress the benefits they feel the Institute could derive from involvement in public education matters.

Gregg Wright would like to see Caltech students teaching twice a week in grade schools as a type of laboratory work.

"All of us have learned a lot more

Another said: "Maybe a look at creativity before it gets squashed will help us revive it at Caltech."

Coming up on April 19 and 20 is a conference at Caltech to plan a proposed "Institute of Educational Change" for this summer. The ASCIT Research Center recently got a grant of \$3,000 from the Rosenberg Foundation of California to put on the conference, which will have Dean Dwight Allen of the University of Massachusetts' School of Education as keynote speaker. Allen is nationally known for his activities in discard-







have any definite answers, either, but there's a critical need to explore different methods."

At the Cleveland school the Caltech teaching group includes Dan McMahon, an assistant professor of biology, and nine other students and research associates. They are, they hope, showing 50 third, fifth, and sixth graders that science can be exciting. They teach the third graders twice a week during school hours, the fifth and sixth graders twice a week after school. The older children have asked if the project could be a five-days-

about education at Caltech since we've been teaching elementary students," he said. "There's a lot in the field of experimental education that might find a place at Caltech-so that there would ultimately be less material passing from a teacher's notebook to a student's notebook without passing through the mind."

Another student teacher says: "Nobody can tell me that people at Caltech are over-trained to have anything to do with elementary education. It took only an hour with those kids to show me that!"

ing or revising many heretofore accepted teaching concepts in favor of innovations intended to make the learning process more dynamic. Chairman of the April conference is Betsy Oliver, student research associate from the University of Massachusetts.

The summer program being considered may involve some 50 college students and 15 public school teachers who will work on educational experiments with 500 elementary and junior high school students drawn from Pasadena area schools.

CALTECH NEWS





CAMPUS NIGHTLIFE

At night Caltech often crawls out from under the day's academic loads and takes on a new kind of vitality, as shown in these pictures taken in March. Winnett Lounge is comfortably filled by those wanting to meet poet William Merwin and hear him read (above). A room full of students in room 111 Mudd encounter actress Nina Foch and her ideas on creativity (left, above). In Fleming a committee of amateur talent scouts holds a preview of a new singing group, the Baker Street Irregulars, who will appear in Beckman Auditorium April 19 (below). And every night about 10 p.m. the coffee house wakes up (left, below); this is where student activists percolate, and where people like David Wood, the acting associate dean of students, have the best chance to rap with them.



RA's: I come home and find my wife entertaining a room full of men

Continued from page 1

jacent room. Dabney was chosen because there was an RA vacancy, the apartment would have its own balcony and outside entrance, and there were no remodeling problems. The residents agreed to try having a married couple in their midst, and requests for applicants were posted around campus.

There wasn't a flood of them. The few couples who did apply were asked to dine at Dabney to case the surroundings and residents, while the students made their own judgments on the applicants.

The men chose John and Sandra Webb, recently arrived from Sydney, Australia. John was beginning graduate work in chemistry, and Sandy, with a master's degree from Cambridge in physiology, was working as a research assistant in biology.

Although they knew they were the first married RAs they were surprised to discover what objects of interest they were. The Webbs were frequently asked "What's it like?" questions: "Isn't it noisy?" "Isn't there a lot of loud music at all hours?" "What's it like being THE woman in an undergraduate house?"

Having a woman in the house wasn't an easy transition at first for either side. There were islands of awkwardness as students wondered how you treated a young married woman under the same roof. She wasn't like a mother; she probably deserved a shade more deference than a sister; and she wasn't potential date material. Many of the students chose the simple way out of the discomfort. They ignored her. In addition, the students who had felt free to drop in on a male RA at all sorts of odd hours were hesitant to go knocking at the Webbs' door.

But Sandy's imperturbability helped make her eventual acceptance easier. She didn't let being treated like the wallpaper bother her, because she understood what it stemmed from. The turning point seems to have come around the end of first term, when Sandy made a great hit as the "elf" who traditionally passes out gifts at Dabney's Christmas party. Also, word got around from the first ones who visited the Webbs' apartment that there was nothing to it-the welcome was there, and visiting John and Sandy was often more interesting than sitting around talking to a male RA. "Now," John says, "it seems as though I'm always coming home and finding my wife entertaining a room full of men."

John's idea of what an RA should be is a person, possessing more maturity than undergraduates, who is around to be an advisor and friend when it is requested. He thinks of himself as neither a father figure nor a peer group pal.

"If there's any situation that seems to need my intervention—and they don't come up often—I'd rather use friendly persuasion. About the only time I've done this is when I've felt that some house member is getting a rough time ment in Ruddock House. And five or six graduate couples have approached the Webbs asking how to become RA's.

John and Sandy will continue living in Dabney House next year. When John gets his PhD, their present thought is to teach in an underdeveloped country.

"We feel," Sandy says, "that our own lives have been so easy—first in Australia and then here at Caltech. We'd eventually like to give some of the chances we've had to other people."

Humanities Faculty Showing Their Stuff

The lives and works of literary figures are deep concerns of a dozen scholars in Caltech's humanities and social sciences division. But the research this represents is not always clear to those who deal primarily with mathematical concepts, chemical formulas, or electron microscopes. To convey some idea of the depth and excitement in these studies J. Kent Clark, professor of English, has set up a series of Humanities Seminars on Wednesday mornings at 11 o'clock in 206 Dabney Hall.

So far about 100 students, faculty, and miscellaneous others have attended each of the five lectures that were given during the winter term. Six talks are planned for the spring, and the public is invited.

"The quality of each talk has been a challenge to everyone who still has his ahead of him; it's like trying to follow a dog act," says Clark, speaking of the interest and enthusiasm with which each speaker has responded to the chance to expound publicly on his research interests. "The results have been eminently publishable, too, and that's another dividend."

During the winter term William Cozart spoke on "Narrative Irony in *The Canterbury Tales*"; Oscar Mandel on "The Nature of the Comic"; David Smith on "The Heart of Conrad's Darkness"; George Mayhew on "The Many Faces of Stephen Dedalus"; and Beach Langston on "Faulkner's Traditionalism and *The Sound and the Fury*."

Subjects that will be covered in the six seminars planned for spring term are: literary theory and practice of T. S. Eliot, by J. Kent Clark; Shakespeare and *The Tempest*, by Hallett Smith; literary salvage, by David Goslee; two worlds opposing value systems in literary tradition, by Charles Newton; Willa Cather, by John Zeigel; and uses of linguistics, by Bozena Dostert.

Clark is hoping that the English seminars this year will encourage the faculty in history to provide a similar series next year. "There are a lot of experts in the division, and they're doing exciting things. We ought to have a chance to hear about it from them."



from some of the others."

John and Sandy sometimes split attendance at campus meetings where RA's may be included. For instance, Sandy becomes the Dabney RA at the meetings held to plan renovation of the old house. Other duties are carried out by one or both as seems best and natural at the time. Within the house, the joking relationship has Sandy THE RA and John the House Mother.

An indication of the Dabney experiment's success is that planning studies have been made for a married RA apart-

THE ELECTRIC TALKING MACHINE

Caltech's language laboratory has a new home. The austere but well-equipped room over which James Greenlee, assistant professor of French, is presiding used to be the dark and eerie lower level of the humanities library in Dabney Hall. When the library moved into Millikan Memorial, the upper level was converted to offices, the lower to the lab. Each of the 29 cubicles has a tape deck that plays pre-recorded cassettes, and each is connected to the master console where the instructor monitors students' recitations and talks to them. The lab also has a studio for recording master lessons.

MP Wants Closer Europe-U.S. Ties

A Briton's opinion of the best ways to expand mutually beneficial relations between Western Europe and the United States during the next ten years was presented in Dabney Lounge on March 5. Under sponsorship of Caltech's faculty committee on programs, the Hon. Eldon Griffiths, Member of Parliament and one of England's leading young statesmen and journalists, gave a ringing exhibition of House of Commons rhetoric.

Griffiths, now Foreign Affairs Secretary of Britain's Conservative Party, took an MA at Cambridge before studying at Yale on a fellowship, where he earned a Master's degree in history. Later he was managing editor of *Newsweek* and correspondent for *Time* and *Life*. Elected to Parliament in 1964 (representing the district of Bury St. Edmunds), he represents a constituency that includes the largest American Air Force installation in



Eldon Griffiths

Britain. He is considered to be a leading Tory candidate for future Prime Minister.

Griffiths' premise is that today Europe is faltering. In his opinion, some of its political leaders are pessimistic over an increase of feuding nationalism, which has splintered the progressive unity of only a few years ago.

He is particularly concerned with Europe's seeming dependence on the non-European powers. An example, he says, is that for centuries, Western Europeans have considered the Mediterranean to be "our sea." On any day more than 2,000 merchant ships are crossing it to trade. Now Soviet naval ships are among them, a new development that is under constant surveillance by the Royal Air Force. Yet, if containment becomes necessary, England, once the great naval power, will have to depend on the United States Sixth Fleet. That realization, he claims, will result shortly in the return of the British Navy to the Mediterranean. Griffiths also predicted that when his party regains power a British aircraft carrier will return to Singapore.

Griffiths also refers to Europe's inability to react to the Soviet occupation of Czechoslovakia as a measure of its present impotence.

Griffiths' opinion of the Common Market, of which Britain is not a member, is that it "is in shambles." He stressed the desirability of strong pan-European agencies that are open to full Western European participation, not tight little customers' unions of six members.

In Griffiths' opinion, Europe should be closely linked to the United Statesin the interests of both parties. America, of course, has a terrific stake in Europe's economic development. Since World War II Europe has received \$40 billion from the Marshall Plan, as well as continued American military expenditures for European safety. During the early part of this period America was clearly the superior international force, thanks to its military might, air force, strong economy, and financial power. Today the gap has narrowed. America has suffered a drop in her balance of payments, and Europe fears a nuclear war. Better relations between the United States and the Soviet Union would allay many of Europe's fears.

Two Memorials Set Up

A memorial lectureship honoring the late Albert Tyler, professor of biology, has been endowed at Caltech. Tyler, who died last November at the age of 62, had served on the Caltech faculty for 40 years; he was also a Caltech alumnus, having earned the Institute's first PhD in biology in 1929. He was well known for his research in embryology, population problems, and marine biology.

The lectureship will bring a leading scientist in biology or a related field to Caltech each year for a visit up to four days long. Each lecturer will make at least one major address in Beckman Auditorium for the benefit of students, faculty, staff, and members of the surrounding community.

A memorial fund honoring Jean-Jacques Weigle—a Swiss scientist who did much of his research at Caltech—has been established at the Institute. Weigle, who died last December at the age of 67, was head of the department of physics at the University of Geneva, Switzerland, for 17 years, and had been a research associate in biophysics at Caltech since 1949.

The memorial fund was established to bring persons of outstanding ability to Caltech to speak, work, or study in the division of biology. Recipients will include scholars and students who will bring new ideas and concepts, new teaching methods, and high potential to Caltech.



Caltech's competitors in the NAIA national championships: Wright, Tyson, Sheffield, Kalisvaart.

NAIA National Championships: Swimmers Place Tenth, Set Seven Records; Wrestler Takes Sixth

Swimming

Let there be little doubt about it; SCIAC swimming competition is getting fierce. Three of the conference's teams placed in the top ten in this year's NAIA National Championships on March 20-22. Caltech, with one of its finest teams ever, was tenth.

The four swimmers who went to the meet at George Williams College near Chicago set seven new Caltech records there, bringing to ten the number of new school marks this season. Freshman Steve Sheffield (butterfly and distance) had a hand in seven of those ten. His teammates at the nationals were seniors Gregg Wright (backstroke) and Maarten Kalisvaart (relays), and junior Mabry Tyson (breaststroke).

The 400-yard medley relay led off the national competition, with the quartet taking sixth place with a school record time of 3:46.9. The 400-yard freestyle relay time was a record 3:21.7, good for ninth place.

Wright placed fifth in the 100-yard backstroke, with a record time in the preliminary heat of 57.4. He then took ninth in the 200-yard back. Tyson set two school records with a seventh place in the 100-yard breaststroke in 1:03.6 and an eighth place in the 200-yard breaststroke in 2:21.1. Sheffield took seventh in the 200-yard butterfly with a Caltech record time of 2:04.4, and tenth in the 100-yard butterfly with a record time of 55.3.

The other three records this season came in the 1,000-yard and 500-yard freestyle, in which Sheffield swam 10:59.2 and 5:22.8, respectively, and in the 800yard freestyle relay, where the same four men swam in a time of 7:52.7.

Wrestling

Alan Beagle, fresh off first places in both the SCIAC and NAIA District 3 191-pound wrestling championships, finished sixth out of a field of 45 at the NAIA national championships in Omaha. That excellent performance closed out Caltech's most successful ever wrestling season. With only two seniors on this year's team (Beagle is a junior), prospects for next year look very good. According to coach Tom Gutman (who also coached the Caltech football team to its best season in four years-one win), Beagle has an excellent chance to win the NAIA national championship in his class next year.

ALADAR HOLLANDER 1883-1969

Aladar Hollander, professor emeritus of mechanical engineering at Caltech, died on March 13 of heart failure at his home in Los Angeles. He was 85, and would have been 86 on March 15.

Hollander, a native of Janoshalma, Hungary, served on the Caltech faculty from 1940 to 1951, when he retired. He began teaching at the Institute as a lecturer in centrifugal pump design, a field in which he held some 75 patents.

Hollander received his master's degree at Joseph Royal University in Budapest, Hungary, in 1904 and did further postgraduate work at the Technical University in Zurich, Switzerland.

5



Sun Takes Alumnus Far Afield

Warren Arnquist (PhD '30) is the kind of man who would travel to Siberia to observe an event lasting 42 seconds, which is what sometimes happens when you specialize in total solar eclipses.

As a research scientist in astrophysics at the McDonnell Douglas Advanced Research Laboratories, Arnquist's pursuit of the total eclipse has taken him to Siberia, the wilds of Peru, the mid-Pacific, and northwestern Canada. Next year comes southern Mexico. His particular interest is the chromosphere and corona with regard to structure related to potentially damaging radiation accompanying some solar flares. His goal? To help find some way to forecast the "weather" in space.

Arnquist, 64, came to Caltech in 1927 from Whitman College to work under Robert A. Millikan on electron scattering in gases. Then he joined the physics department of what is now Auburn University in Alabama. He was a physicist for the Gulf Research and Development Company in Pittsburgh when Charles Lauritsen asked him to return to Caltech at the start of World War II and head research operations for a rocket project. After the war he did research for the Army, Navy, and industry on range instrumentation, rocket flight testing, and infrared applications to missiles.

He joined Douglas Aircraft in 1961, where he coordinated and helped develop the company's advanced research program. It was in 1963 that he became actively interested in solar physics and got involved in his first total eclipse, when Douglas and the National Geographic Society decided to outfit a DC-8 as a flying observatory to study an impending total eclipse over northwestern Canada. Arnquist was made director of the project, in which academic, governmental, and commercial scientific groups participated. It was the first time a four-engine jet plane had been used as an observatory, and the first international airborne eclipse expedition in history.

The flight, which prolonged the viewing time by chasing the eclipse at 40,000 feet (above 85 percent of the earth's atmosphere), was so successful that at the next total eclipse, two years later, four planes were used. In one of them, NASA's Ames Research Center outfitted a Convair 990 for a 580-second look at the eclipse. In this expedition Arnquist and his Douglas colleagues were responsible for the navigation strategy, for safety testing of special windows, and for the installation of all the experimental equipment. On the 1965 expedition, Arnquist took his first polarization photographs of the corona.

Arnquist's trips became increasingly exotic. The next year he headed a fourman expedition into the mountains near Arequipa, Peru, to continue his polarization photography and study the corona with a photoelectric photometer. They arrived in Arequipa ten days before the scheduled eclipse and, after observing the cloud formations, started climbing the mountains. They chose a site on the western slopes 10,000 feet up, even though they had planned to push closer to the umbra center at 14,000 feet. "But if we had," Arnquist recalls, "we would have been completely clouded outwhich just shows how chancy these things can be."

Last year was his Siberian year. The one total solar eclipse of 1968 was due on September 22. Arnquist headed a group of four from his company, and joined more than 50 Soviet and foreign scientists who had converged on the village of Yurgamysh, about 800 miles east of Moscow. He described the Siberian eclipse as one of those chancy things again—a 70-percent cloud prediction and a low afternoon sun only 18 degrees above the horizon at the best observing site along the path of totality. But positive thinking prevailed, and the eclipse had its day.

For Arnquist, the flying laboratories don't fit in his current plans. He says he can now do his own research on polarization of the visible corona almost as well, and at far less cost, from the ground. Right now, he finds it almost a "must" to find cheaper ways to do things. General reductions in government basic



Warren Arnquist, PhD '30

research support, because of the cost of the Vietnam War, demand a hard look at expenses.

Next year he takes a mobile laboratory to the southernmost part of Mexico for the total eclipse of March 7, 1970. That eclipse comes during the sun's period of greatest activity during its 11-year cycle. Correlation of data from his years of observing will complete his current goal of observing the sun from minimum (back around 1964) to maximum activity.

"And then maybe," he says with a hopeful grin, "we'll wind up with enough information to convince us we need to continue the program into the next part of the cycle."

Glee Club Annual Home Concert Will Be May 9

The Caltech Glee Club will give its annual home concert in Beckman Auditorium on Friday, May 9, at 8:00 p.m. The men, directed by Olaf Frodsham, will be joined by the Women's Glee Club of Long Beach City College. The program will include sacred and secular music, including songs from Broadway shows, spirituals, a selection from Bach's *Peasant Cantata*, the "Gloria" from Missa Mater Patris by des Prez, and selections from Brahms' Neue Liebeslieder.

ALUMNI ASSOCIATION

AND AND BUILDED AVERTING

ALUMNI CALENDAR

April 12, Swiss Park, Duarte. BARN DANCE.

May 10, all day, campus. ANNUAL ALUMNI SEMINAR.

June 11. ASSOCIATION ANNUAL DINNER MEETING.

Advance notice only. Details of each event—including ticket information will be mailed by the Alumni Association.

Coming Caltech Events

- Monday, April 14, 8:30 p.m. Beckman IN DEFENSE OF FREE SPEECH. Abraham Kaplan. Caltech Lecture Series. Free.
- Friday, April 18, 8:00 p.m. Beckman THE BAKER STREET IRREGULARS presented by the Associated Students of Caltech. "Folksy-Pop Concert" with Barbara Smith, Ron Kickasola, Mike Smith. General admission price to Caltech family: \$1.
- Sunday, April 20, 8:15 p.m. Dabney GOLDMAN-BROWN DUO. Program: Beethoven (Sonata in F major, Op. 24); Brahms (Sonata in A major, Op. 100); Bartok (Sonata No. 2). Free.
- Monday, April 21, 8:30 p.m. Beckman *REBIRTH OF POLITICAL EXTREM-ISM IN GERMANY*? Eberhard K. Jobst. Caltech Lecture Series. Free.
- Friday, April 25, 8:30 p.m. Beckman ALI AKBAR KHAN, sarodist, in a program of Indian classical music. \$5-4-3.
- Monday, April 28, 8:30 p.m. Beckman SMOG: A MODEST PROPOSAL. Sheldon K. Friedlander. Caltech Lecture Series. Free.
- Friday, May 2, 8:30 p.m. Beckman West coast premiere of two films from The Kinetic Art division of Universal Education & Visual Arts: "PRAGUE: SUMMER OF TANKS" and "THE RIGHT TO SPEAK: THE PARIS STUDENT REVOLUTION." The film makers must remain anonymous. GA: \$2; students: \$1.
- Sunday, May 4, 8:15 p.m. Dabney *PACIFIC* WOODWIND QUINTET performing music by Nielsen, Bozza, Persichetti, Villa-Lobos. Final concert in the series. Free.
- Monday, May 5, 8:30 p.m. Beckman SPERMATAZOA. Charles Brokaw. Caltech Lecture Series. Free.
- Tuesday, May 6, Winnett Lounge. 8 p.m. POETESS DIANE WAKOWSKI reading from her own work. Free.
- Friday, May 9, 8:00 p.m. Beckman *CALTECH GLEE CLUB*. Annual Home Concert. Guest artists: Long Beach City College Women's Glee Club. Free.
- Monday, May 12, 8:30 p.m. Beckman MARINER AT THE MARS FRON-



STUDENT BARN DANCE, CIRCA 1950

Beer, crew races, music, and remembrances of things past will be offered to adventurous alumni on Saturday evening, April 12, at the Alumni Association's barn dance at Swiss Park, Duarte.

ANNUAL DINNER MEETING RODGER YOUNG AUDITORIUM LOS ANGELES WEDNESDAY, JUNE 11, 1969 REUNIONS—CLASSES OF 1964-59-54-49-44-39 34-29-24-19-14 MARINER AT THE MARS FRON-TIER. H. M. Schurmeier, Mariner Mars 1969 Project Manager, JPL. Final lecture in the Caltech Lecture Series. Free.

Friday and Saturday, May 23, 24, 8:30 p.m. Beckman

THE THREEPENNY OPERA, produced, directed, and performed by the students of the California Institute of Technology. Annual musical presentation. Book by Bertolt Brecht, music by Kurt Weill, English adaptation by Marc Blitzstein.

<image>

ODOR, TASTE, TOUCH . . .

The Alumni Association's annual wine tastings are guaranteed successes. This year more than 440 lucky people sampled some of California's finest wines at the events on March 7 and 14 in the Athenaeum. Highlight of the March 14 tasting (for experienced imbibers) was the presence of some of the vintners themselves, answering questions as part of the lecture. Winners of the drawings for free cases of wine were David Allen, '63, of Marina del Rey, and Ray Berbower, '45, of Long Beach.



Frosh Profile

To acquaint prospective applicants with some of the qualities of the kind of student likely to do well at Caltech, the Office of Admissions each year publishes a profile of the most recent freshman class enrolled. In 1968 the report said, among other things, what seems obvious: that outstanding scholastic ability is desirable; 800 of the total of 1,104 applicants ranked in the top fifth in their secondary schools.

To no one's surprise, 44 percent of the 306 who were accepted had made all A's in mathematics and science subjects, but 59 percent of them had A grades in all subjects taken in high school.

The College Board Scholastic Aptitude Tests and three achievement tests are required of each applicant, and of those who scored in the 750-800 range (highest group) in each test, more than 50 percent were accepted. Scores were predictably high in all the science and math tests, and 181 of the 201 who enrolled in September scored above 750 on the Level II Math test. The verbal aptitude and English achievement test scores for most enrollees were also generally high, but they were below 450 for five men on the verbal test and for two in English.

The 201 freshmen who registered in September came from 176 schools—156 public and 20 private—and most of them were located in the western and northwestern area of the United States. An impressive 76 percent of the class got scholarships from Caltech or other sources. The average amount was \$1,778.

For the benefit of those contemplating applying for admission to Caltech, the profile contained some information gained from earlier classes. For instance, on the Wechsler Adult Intelligence Scale 52 percent of the Caltech student body score in the 130-139, or very bright, range, and 11 percent are above 140, which places them in the category of geniuses. Nonetheless, 2 percent scored below 120; they're undoubtedly hard workers. The Kuder Preference Record indicates that the typical Caltech student is high in scientific, computational, literary, and musical abilities; he is low in social service, persuasive, clerical, and mechanical interests. The Strong Vocations Interest Test suggests that Caltech students are unlikely to become life insurance or real estate salesmen, bankers, veterinarians, artists, or morticians.

32nd ANNUAL ALUMNI SEMINAR LECTURES

The annual alumni seminar, to be held on campus May 10, will feature 12 lectures (described here) representing all six academic divisions, the faculty, and the students. It will also be the first chance for many alumni to hear Caltech President Harold Brown, who will speak at the general after-lunch session in Beckman Auditorium. The dinner speaker will be announced in April.

Alumni and their families can attend as many as five of the twelve lectures in addition to the general session and evening talk. Reservation forms will be mailed to alumni in southern California. Other alumni interested in attending should write to Jim Black, Executive Director, Alumni Association, Caltech.

SMOG ALERT!

John H. Seinfeld Assistant Professor of Chemical

Engineering

The ability to forecast smog would be a great step toward effectively combating and controlling the effects of smog. Research has been carried out at Caltech to develop an analytical model of the dynamic formation and spread of smog over an urban area. Predictions of this model will be compared to an actual southern California smog attack, whose various stages will be dynamically illustrated.

CALTECH—THE PRESIDENTIAL SEARCH

Robert P. Sharp Professor of Geology

Selection of the president of an academic institution is not a democratic process, for the power of appointment lies solely with the Board of Trustees. The Caltech Board invited a faculty committee to advise in the search for and selection of the president. The history of the 18-month procedure and the eventual involvement of large segments of the Caltech community demonstrate the virtues of such

A VIEW OF THE EARTH'S INTERIOR Don L. Anderson

Professor of Geophysics Knowledge of the interior of the earth is a fascinating revelation. Seismological investigations are providing us with an increasingly refined picture of its makeup. The evolution of the earth to its present state and the connection between the internal structure of the earth and seismic activity in southern California is of special interest to those living here.

SEARCH FOR LIFE ON MARS Norman H. Horowitz

Professor of Biology

The question of life on Mars is one of the most engaging scientific problems of our time. A review of current thinking about Mars and a discussion of instruments being developed by the Mars Project will be presented. This progress report is particularly timely in view of the experiments currently under way by means of Mariner spacecraft, which are now enroute to Mars.

OF BROKEN RIBS, ROCKS, AND ROCKETS

Wolfgang G. Knauss

Assistant Professor of Aeronautics The fracture of many materials is governed by basically the same laws. This makes it possible to examine the breakup of airplane components, bones, concrete, and the earth's crust from a common viewpoint. The talk illustrates what can or cannot be done with this understanding to prevent small and large disasters.

THE FAR REACH OF BIOLOGY

James F. Bonner

Professor of Biology

We know that the earth's elements were created circa 4.8×10^9 years ago. By circa 1×10^9 years later, living creatures similar to bacteria and algae were rampant upon our planet and engaged in creating our oxygencontaining atmosphere. Until some 1×10^9 years before the present, a span of almost three billion years, evolution appears to have stood still, until, in a burst of creativity, our new kind of creatures appeared. What was the hang-up; in what way are we so special?

PULSARS—STELLAR DEATH RATTLES

Peter Goldreich Associate Professor of Planetary Science and Astronomy

Pulsars are sources of periodic, broadband radio emission. Those discovered to date have periods between 0.03 and 3 seconds. It is now generally believed that pulsars are rotating neutron stars which formed during the explosive deaths of ordinary stars. This lecture will describe the discovery of pulsars and their observational characteristics. An elementary discussion of current theoretical attempts to understand the physics of these unusual objects will also be presented.

AFTER VIETNAM—ANOTHER RECESSION?

Roger G. Noll

Assistant Professor of Economics Peace in Vietnam could seriously challenge our present prosperity. In the past, the transi-

tion from war to peace has inevitably brought a recession. Can the historical precedent be broken? Analysis of past mistakes and present conditions indicates it can—with carefully planned and executed readjustment policies. Productive resources freed by peace can be squandered or redirected toward solving domestic problems and improving living standards. Federal government policies will determine which alternative prevails.

DEAR COMPUTER - - -

Frederick B. Thompson Professor of Applied Science and Philosophy

The Rapidly Extensible Language System provides the capability to converse in everyday language with computers. A unique feature of REL is that the computer's vocabulary can be rapidly expanded. This system will be available as a research and instructional tool to the campus by the fall term. It will be demonstrated at this lecture.

THE TIMES THEY ARE A-CHANGIN'

participation.

STUDENT REVOLUTION AT CALTECH

ASCIT Research Center Jim Beck, Director

The ASCIT Research Project involved 70 students from 15 colleges at Caltech last summer. They participated in a program with a unique approach to academic research. The approach was to attack a relevant problem, air pollution, in a program directed and manned by students. Participants in the summer project will talk of goals, research findings, administrative problems, and impact of the project on Caltech.

SUNSPOTS AND THE SOLAR CYCLE

Robert B. Leighton Professor of Physics

One of the best known phenomena of solar astronomy is the periodic appearance of sunspots on the face of the sun. For more than a century it has been known that the number of sunspots varies cyclically with a period of about 11 years. The physical factors responsible for the solar cycle will be described.

Assistant Professor of History

Once a medium of vapid love lyrics, popular music in the 1960's has taken on a new seriousness. In the words of their songs young musicians have expressed their alienation from and disdain for American institutions and mores. Helping to define and codify the standards of the youth subculture, the songs have also echoed critiques of American life made by the intellectual community. At the same time they have affirmed the belief that the individual should be free to "do his own thing." This talk will be illustrated with selections from recent music.

CALTECH NEWS

PERSONALS

1922

8

HOWARD G. VESPER, retired director and vice president of the Standard Oil Company of California and a Caltech trustee, has been elected chairman of the General Advisory Committee to the Atomic Energy Commission.

1925

LINUS PAULING, PhD, professor of chemistry at the University of California at San Diego for the last two years, has accepted a position on the faculty of Stanford University as of July 1969.

1926

JOHN L. FAHS has retired from the development department of E. I. duPont de Nemours & Company in Wilmington, Del., after 38 years with the company. He was a chemist with the Roessler & Hasslacher Chemical Company in Niagara Falls when the firm was acquired by DuPont in 1930, and he has served in various technical and management positions.

1929

KARL A. GANSSLE retired recently as vice president of engineering for Southwestern Bell Telephone Company in St. Louis, Mo. He began his career in the telephone industry in 1929 with Pacific Telephone Company in Los Angeles. After 14 years there he joined AT&T in New York and came to Southwestern Bell in 1950. He was named vice president-engineering in January, 1968.

1930

HOWARD CARY, co-founder and chairman of Cary Instruments, Monrovia, Calif., and



Ganssle, '29

Simmons, '35

Placement Assistance To Caltech Alumni

The Caltech Placement Service may be of assistance to you in one of the following ways:

- (1) Help you when you become unemployed or need to change employment.
- (2) Inform you of possible opportunities from time to time.

This service is provided to alumni by the Institute. A fee or charge is not involved.

If you wish to avail yourself of this service, fill in and mail the following form:

To: Caltech Placement Service

California Institute of Technology

director of Varian Associates, has been awarded the David Richardson Medal, an annual presentation of the Optical Society of America. The medal was established in 1966 and recognizes the achievements of scientists who work in strictly applied areas of optics.

1934

NICK T. UGRIN, a corporate vice president with Union Oil Co., was recently appointed to fill out the term of a retiring member of the San Marino, Calif., school board. His term expires in June 1971.

1935

NORWOOD L. SIMMONS, manager of product planning for the motion picture and education markets division of Eastman Kodak Company, has been promoted to general manager of the division. Simmons joined Kodak in 1937 in Rochester, N.Y., and from 1941 to 1965 served in the West Coast Division of the motion picture film department in Hollywood. He has been in his present position since 1966.

1944

EDWARD A. GOLDSMITH was recently named manager, engineering, PWR systems division, Westinghouse Electric Corporation. Headquartered in Pittsburgh, he will be responsible for nuclear service department engineering and service activities. Goldsmith joined Westinghouse in 1955 and was manager, engineering programs, engineering department, PWR systems division, Nuclear Energy Systems, prior to this appointment.

1945

W. LEE MURPHY, division superintendent of the alloy and tool steel division of Bethlehem Steel Corporation, Bethlehem, Pa., has been promoted to division superintendent of the service division. Murphy came to Bethlehem in 1947 through a college-graduate training program. He served in several positions in the South San Francisco plant before transferring to Bethlehem in 1965.

1946

RICHARD G. KUCK recently became general sales manager for the Southern Counties portion of Pacific Telephone and Telegraph, a position that covers the marketing

Membership in the Caltech Alumni Association (\$10 a year) brings:

- ► Engineering and Science magazine nine times a year
- Alumni Directory, to be issued this year
- ► Athenaeum membership privilege

ARTICLES IN THE MARCH ENGINEERING AND SCIENCE MAGAZINE

► California's Ground-Moving Weather, by Richard H. Jahns. An evaluation of the relationship between weather and undesirable ground



Goldsmith, '44 Murphy, '45

activities of the five Southern California counties of San Diego, Imperial, Riverside, San Bernardino, and Orange. Kuck has spent the last two years in Cooperstown, N.Y., as director of the Bell System's School for Advanced Communications Systems Training. He is now in San Diego.

1947

RICHARD C. GERKE, MS, is chief engineer in the Oceans Operations Division of the Dillingham Corporation in San Diego. He was formerly a consulting engineer in La Jolla, Calif.

FELIX A. KALINSKI, MS, president of the CBS-Comtec group, has been elected a director of Columbia Broadcasting System, Inc., in New York.

ROBERT S. MacALISTER was recently promoted to vice president and operations manager for Occidental of Libya, headquartered in Tripoli.

1948

IAMES R. DAVIS, MS '49, vice president of Converse, Davis & Associates, is the 1969 vice president of the Consulting Engineers Association of California.

BRUCE D. GAVRIL recently received an Outstanding Contribution Award from the data processing division of IBM for his role in the development of the IBM 2903 special control unit. He is a staff member at the Computer Sciences Department of IBM's Thomas J. Watson Research Center, Yorktown Heights, N.Y.

LEROY C. LAND, MS, ME, a colonel in the U.S. Army, received the Air Medal in January near Phu Bai, Vietnam, for meritorious service in aerial flight. He is the assistant chief of staff for civil affairs, Headquarters, XXIV Corps, in Vietnam.

1950

DONALD PAUL MERRIFIELD, S.J., is the new president of Loyola University of Los Angeles, effective June 1969. Merrifield is currently a faculty member at the University of San Francisco and a consultant in theoretical chemistry at Caltech's Jet Propulsion Laboratory. He has also taught at Santa Clara University and at Loyola.

1952

MARVIN H. HYMAN, senior engineer with Phillips Petroleum, recently accepted a position as technical director with Frederiksen Engineering Co., Inc., Oakland, Calif., consulting engineers.

1954

WALTER C. HAMILTON, PhD, senior chemist at Brookhaven National Laboratory, Upton, N.Y., has been elected president of the American Crystallographic Association, a member society of the American Institute of Physics.

1960

KENNETH P. SCHOLTZ and his wife have moved to London, England, where Scholtz will work for one or two years as an attorney for the firm of Lucos & Co.

1962

RONALD K. LINDE, MS, PhD '64, is director of physical sciences at the Stanford Research Institute in Menlo Park, Calif.

WILFRED P. CHARETTE, MS '64, PhD '68, is co-founder and president of SYSTO-NETICS, Inc., Anaheim, Calif., a new computer systems company he and his classmate at Caltech Charles Schaffner formed in March.

1963

DAVID OLLIS completed his doctorate in chemical engineering at Stanford University in January and is now in Nancy, France, at the Centre de Cinitique Physico-Chimique on a postdoctoral fellowship.

1964

BOB L. S. CHING is on the staff of The Boston Consulting Group in Boston, a professional management consulting organization.

RALPH YOUNG has accepted a position as assistant professor of chemistry at Jackson State College, Jackson, Miss. He received his PhD from Stanford University in September.



Surber, '68

1968

GREGORY J. BREWER was married November 30 to Yvonne Harrington and is now doing graduate work in biochemistry at the University of California at San Diego. Yvonne was formerly a secretary in the biology division at Caltech.

PHILIP R. PERRY, MS, has been commissioned a second lieutenant in the U.S. Air Force following graduation from Officer Training School at Lackland AFB, Tex.

CHARLES A. SCHAFFNER, PhD, is cofounder and vice president of SYSTO-NETICS, Inc., a new computer systems company in Anaheim, Calif.

ROBERT E. STARRETT has completed 11 weeks of training in San Jose, Calif., in preparation for his assignment to the Philippines as a Peace Corps Volunteer. He will teach at the secondary and university levels and in teacher training colleges.

FRANK T. SURBER, MS, recently graduated from Officer Training School at Lackland AFB, Tex., and has been commissioned a second lieutenant in the U.S. Air Force. He now goes to Vance AFB, Okla., for pilot training.



Pasadena, California 91109

Please send me: (Check one)

An application for placement assistance

A form indicating a desire to keep watch of opportunities although I am not contemplating a change.

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movements reveals an ominous historical correlation.

► The Early Days of Harold Brown. Picture story of his first few weeks in office.

► Confessions of a Genial Abbott—II, by Robert A. Huttenback. The new Dean of Students continues his look back at a colorful 11-year career as Master of Student Houses.

Alumni Board Nominations.

1959

M. GRANT GROSS JR., MS, PhD '64, is currently at the Marine Sciences Research Center at the State University of New York at Stony Brook, L.I. He was formerly in the division of sedimentology at the U.S. National Museum in Washington, D.C.

JAMES H. HARVEY JR., a captain in the U.S. Air Force, has completed combat crew training at Davis-Monthan AFB, Ariz., and is on duty at Da Nang AB, Vietnam.

OBITUARIES

1942

THOMAS D. ELLIOTT died in June 1968. He had been with the Long Beach, Calif., Unified School District since 1950, and was its chief engineer. He is survived by his wife and three children.

1946

CLYDE L. WERTS, S.J., MS, professor of electrical engineering at Loyola University of Los Angeles, died in February from a heart attack. Werts had been a professor at Loyola since 1946.