



—photo by Yerby Wallofsky

Due to the discouragement of initiation waterfights among the Houses, resourceful sophomores this week led plucky frosh into glorious new types of battles among Houses. Note Dr. Huttenback at right, scrutinizing proceedings in hope of determining whether the situation is getting out of hand. Also note frosh looking enviously at forbidden cigar.

Watson to Give "Liquid Air" at First of Caltech Lecture Series

BY JOHN ROUSE

October 12 marks the beginning of a new public lecture series at Caltech. The lectures will be given in Beckman at 8:15 p.m. each Monday evening and will be free.

This new lecture series replaces the Friday Evening Demonstration Lectures, which since the 1920's have been presented to the public in 201 Bridge. The new series will be given by many noted scientists and engineers, to insure accurate and interesting presentations. Dr. J. Harold Wayland, chairman of the lecture series subcommittee, explained that "this broad series of lectures will present to the southern California community something of the diversity and depth of the research and study going on at Caltech."

"Liquid Air"

The opening lecture on October 12 will be Dr. Earnest Wat-

son's famous and spectacular "Liquid Air" demonstration, which anyone, scientist or layman, will enjoy. Watson, former dean of faculty and professor emeritus of physics, was appropriately chosen to give the first lecture, as he was the man most responsible for originating and sustaining the original program.

Many alumni are expected to attend the Watson lecture, which will immediately follow an alumni dinner in the Athenaeum.

The major difference between the new series and the old is the switch to Beckman to take advantage of its elegance and 1200-seat capacity. The lectures will be given on Mondays instead of Fridays in order to free the auditorium for student use on weekends.

Tickets

For the new lectures, the main floor seats of Beckman will be reserved, but not the balcony

seats. Persons wishing to obtain tickets may do so by writing to the Caltech Ticket Office.

The request should include the number of tickets needed and the dates. A stamped, self-addressed envelope must be enclosed with the request.

(Continued on page 4)

Drama Club to Hold Tryouts

Few people have yet managed to forget the dazzlingly brilliant 1963-64 season of the Caltech Drama Club, which was highlighted by a flawless presentation of *The Monster* in February and — if it is possible — an even more flawless presentation of *Six Characters in Search of an Author* in May.

Founding its wellspring upon this and the grand tradition of Shaw, Saroyan, and Williams (to name but a few), the Caltech Drama Club launches intrepidly into its 1964-65 season with a production of three one-act comedies by that French playwright among French playwrights, Georges Courteline. Bearing the curious but unique titles of *Hold on, Hortense; A-raid to Fight; and Article 330*, they give us every reason to believe that a thoroughly enjoyable and enlightening time will be had by all who devote some portion of their time to the accomplishment of the production. **Gad!**

Tryouts will be held this Saturday, October 10, from 2 to 5 p.m.; Sunday, October 11, from 2 to 5 p.m.; and Monday, October 12, from 7:30 to 9:30 p.m. in Clubroom 1 of Winnett. Not only must the cast be selected (and this includes a sizeable number of extras), but also a crew must be organized and put into galvanic-like action.

If you (or your friend, or your father-in-law, or your sorority sister, or the guy you met in Pershing Square last year) have any aspirations at all toward theatrical expression, we invite — nay, we urge — you to be present next Saturday, Sunday, and Monday for this momentous and pedagogical occasion.

Owen, Carstens Speak on Rights

David Owen and Betty Carstens, two of the student civil rights workers who went to Mississippi this summer, spoke to a group of about 80 students in Dabney Lounge, yesterday during the assembly hour. Titled "Mississippi — the Long Hot Summer," the talk was a selection from the ASCIT — Alumni assembly series. Owen and Carstens tried to explain the actual conditions in Mississippi as they experienced them personally.

Owen, son of Dr. Ray Owen of Caltech's Biology Division, told of his work with voter registration of the Negroes of the state. To help explain the situation, Owen pointed out that Mississippi is a poor, rural, and uneducated state. The people have not learned to work together to any great extent, they are not very wealthy, and on the most part they have not finished high school. Thus the centuries of slavery and exploitation of the Negro is deep in the society.

The average white regards the segregation system as a necessary and good part of the southern way of life. As a result, Negroes have been leaving the state in large numbers, especially those with college educations. The police and courts look suspiciously upon the registration attempts, and offer no protection to the Negro and no restraint

upon the anti-registration actions taken by some. Any attempt to change the situation as it is now is met with threats of violence, boycott, and other such methods.

It was in this atmosphere that the voter registration project began. The workers were trying to convince the Negro voters of the necessity for their registration if conditions were to improve. However, there were many problems. The Negro was hesitant about registering and thus making himself a target for white violence. The county registrar has the right to use his discretion in determining the voter's qualifications and thus can and does disqualify Negroes without cause. Even after extensive court action, one registrar only registered 200 out of 2,000 applicants. And now that the workers have gone home and the press has withdrawn, how will the Negro be able to protect his hard-won right to vote? This is a question that only time can answer.

Miss Carstens, a UCLA student, worked in the Freedom School at Mt. Olive, Miss. There she lived with a Negro family and saw the poverty of these people firsthand. In an effort to help the people help themselves, the Freedom School taught typing, some languages and sciences, and most important of all, citizenship. They soon had the community working together, first making demands for telephone service to the village, then in registering people for the Freedom Democratic Party. Soon they were taking an active part in voter registration; but the opposition to their efforts tended to frustrate them. Still, in spite of the frustrations, the people are determined to win their rights.

Chamber Music Begins Sunday

The Caltech Chamber Music Series premieres its fifteenth season Sunday, October 11 at 8:15 a.m., with a performance by the Los Angeles String Quartet. The quartet will play two classical numbers by Haydn and Mozart, and one "very fascinating" modern composition by Alban Berg.

Traditionally held in Dabney Lounge, the Chamber Music Concerts are sponsored by the Faculty Committee on Musical Activities, this year headed by Dr. Ward Whaling.

AFL Music

The concerts began, explained Dr. Hallett Smith, chairman of the Division of Humanities, with a program of recorded concerts in Dabney Lounge. In 1950 the Local 47 Musicians Union volunteered to meet one-half the expense of a program of live concerts — and the Chamber Music Concerts were born.

Later the Union withdrew its support; the Institute, however, undertook the whole budget for the popular series.

Programs

The programs for the concerts, which are broadcast in much the same form at USC, are arranged by Mr. Philip Kahgen. Once a violinist for the Los Angeles

(Continued on page 3)

Stern Elected APA President

Dr. Alfred Stern, professor of philosophy and languages at Caltech, has been elected president of the American Philosophical Association, Pacific Division, for the year 1964-65. He won the honor for his distinguished publications in the field of philosophy.

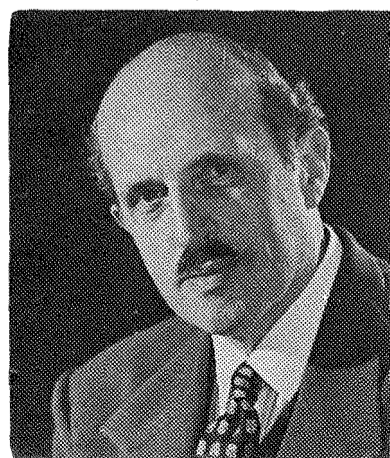
Stern's latest book, *Philosophy of History and the Problem of Values*, has been published in English, French, and Spanish and will soon appear in German and Urdu. The author himself made most of the translations. Italian and Japanese editions are under consideration.

Stern is also one of nine International Scholars, all specialists in Spanish literature or philosophy, who have been invited by the UCLA Spanish Department to lecture this fall during the celebration of the 100th anniversary of the birth of Miguel de Unamuno, renowned Spanish writer and philosopher.

Among the best-known of Dr. Stern's earlier books are *The Philosophy of Values*, *The Philo-*

sophy of Laughter and Tears, and *Sartre — His Philosophy and Psychoanalysis*.

Stern is a combat veteran of both World Wars, and in 1954 was proclaimed a Knight of the Legion of Honor of France. He is also an Officer of the Academy of France, vice president of the Alliance Francaise of Los Angeles, and member of the Advisory Board of Folia Humanistica in Barcelona, Spain.



Dr. Stern

Notices

ALL SENIORS

Dean Bohnenblust has called a meeting of all seniors for tomorrow, Friday afternoon, at 1:30, in 22 Gates to discuss fellowships and assistantships.

REPORT THEFTS

If any thefts of property occur in the Student Houses, report the theft to both the Pasadena Police Department and to the Caltech Guard Office. If Institute property is involved, the theft should also be reported to Mr. Ewart in Throop.

SURFERS RULE!

All members (regular or prospective) of the Surfing Club interested in attending a beach party this Saturday, please contact Len Fisher in 126 Lloyd immediately.

FUN! JOIN C.I.T.C.D. BRANCH

Have a ball in your spare time. Caltech is organizing a Civil Defense Branch. Next Tuesday at 7:30 p.m., Clubroom 1.

LITTLE T'S

Copies of the little t are available from Randy Cassada (65 Ricketts) or Louise Hood (Winnett).

WEDNESDAY COFFEE HOUR

The Student-Faculty Coffee Hour was yesterday. If you missed it, come next Wednesday at 3 p.m. and get your free donuts.

Editorials

Lose Football

There is a distinct possibility that intercollegiate football will be dropped because of lack of players. So far only 21 men have come out for varsity football. With this number, a few injuries in the first games could leave Tech without a starting lineup. If there are too few players, Coach LaB has the authority to cancel the remaining schedule.

In the past few years Caltech has certainly been no gridiron power, yet there has been sufficient interest to gather a team. Now the team is facing an emergency situation caused not by a continuing lack of interest, but by a disastrous reduction of personnel by injuries and school dropouts. Between seven and ten persons have been lost in this manner including many who would have played first string.

The consequences of the cancellation of the football season are many. This year's seniors will be denied the enjoyment of playing. The interest of the members of the other classes will probably be diminished by not playing. There is the possibility that Tech might lose its conference privileges because of this cancellation. Certainly the other sports in which Tech participates should not be put in jeopardy. Also the unique facet at Tech that almost anyone can participate in intercollegiate sports for his own pleasure if he wants to is worth preserving.

The Tech urges any upperclassman or sophomore who has ever played football or has ever wanted to play to see Coach LaB at once. Those people coming out now will not see action immediately, but will be used in the middle part of the season, after they have had adequate practice.

However the interest in the team must be shown immediately before any decision to cancel is made. Eight to ten new men showing interest in the next few days will make the difference.

—Wally Oliver
Stu Galley

Garrison Writes on LBJ

It all began on Registration Day as I was enjoying myself on the beach at Santa Monica. That afternoon President DuBridge received an invitation from the White House stating that Caltech was one of a selected group of colleges and universities around the country chosen to send a representative to a non-political reception there.

I was finally tracked down and confronted with the invitation. With some misgivings (I hated to leave the choking air and balmy 90-degree temperatures) I hopped a jet to our nation's capital. This was Friday evening, October 2. It was raining and gloomy, and I was without my umbrella.

Daddy Speaks

The next morning was beautiful; the weatherman must have heard of the reception for that afternoon. I toured the city and visited some of the most beautiful buildings that I have ever encountered. The pretty parts of Washington were gorgeous, especially with autumn on its way and the sky so blue and clear.

At 5 p.m. I entered the White House, after being checked and rechecked on a list of guests. We were ushered upstairs and

into the East Room. There Dean Rusk, Robert McNamara and Willard Wirtz spoke to me—me and 230 others. Then Big Daddy had a few words for us. He spoke mostly about a plan to be initiated very soon called the White House Fellows. In this plan 15 exceptional young men and women, from 23 to 35 years of age and from various professions, will work under the Vice President, Cabinet members, and in the White House staff. They will serve for 15 months and will see the inside work of our top government officials. It is to be financed by the Carnegie Foundation; I was pleased to hear this won't be out of our tax dollars.

Birds

After these "non-political" talks we all met the President, Lady Bird, and Lynda Bird, very briefly though. He was a smooth cookie with an able family, it seemed to me. Then we had a buffet dinner and back to the East Room for entertainment, which consisted of the Chad Mitchell Trio, Bob Newhart, and Star Getz. It was a lively evening for me, but we were all brought there to listen rather than question or contribute.

From Other Campuses

By Jace

Last week this column featured a classic comedy of confused elections which took place at Antioch College (Yellow Springs, Ohio). I soon discovered, however, that dependable MIT, in its never-ending quest for perfection, had bettered even that total muse of confusion.

Consider the saga of MIT's Tech Engineering News magazine, known to the in group as TEN:

"TEN's problems began late last term when the Managing Board attempted to elect a new board to succeed it. The first election was for two of the four members of the board. Unfortunately, neither of the two persons who had held the positions had previously resigned, thus making the election illegal under TEN's constitution. But this was only the beginning. Since the constitution also pro-

vided that no member of the board could serve for more than 12 months, several of the members of the managing board who participated in the election were no longer legally members.

"At this point, things began to pick up speed, and the confusion proliferated. Several of the members of the board decided that it was impossible to work with another member. They attempted to invoke still another provision of the constitution, this one providing that three members of a board (consisting of General Manager, Editor-in-Chief, Managing Editor, and Business Manager) could impeach a fourth.

Who's on the board?

"By this time, however, no one was quite sure who was on the Managing Board. The im-manded at this point that things ly annoyed, appealed the board's

Huff Spends Summer in India

BY LES FETTIG

The World University Service, one of the most active agencies in Caltech charity drives, played a more personal role this past summer as host to Tom Huff, associate secretary of the Caltech YMCA, on its third annual Asian Seminar. Huff, together with 22 other faculty personnel and 18 junior college students, participated in a world-circling "tour of understanding," ultimately directed at the people of India.

The Asian Seminar is one facet of the World University Service's program attempting to promote inter-university aid on an international basis. The service, with headquarters in Geneva, conducted the 71-day seminar in an attempt to give Huff and his colleagues practical experience in the understanding of a different culture, especially on the university level. Of those taking part in this year's seminar, roughly half of the faculty personnel and 13 of the 18 students were women.

India Compared

The attitudes and conditions of Indian university life were compared by Huff to the American system. Whereas our undergraduates are subjected to final examinations each term for each course, Indian students must cope with only one exam per year, on the basis of which they either pass or fail an entire year's studies. This circumstance

ruling to Activities Council's Arbitration Committee, which upheld him and decided that the managing board consisted of four specific people. The positions Arbitration Committee assigned them, however, did not completely correspond with any of the boards TEN thought it had.

"By this time accusations against individual members of the board and against the magazine as a whole had been brought by various people. Some of these, involving postal regulations and general mismanagement, came to the attention of the Dean's Office, which demanded at this point that things had gone beyond the stage where students groups could handle them."

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IR Center Has Birthday

Caltech's industrial Relations Center celebrated on Sept. 17 a quarter of a century of helping industries resolve problems involving personnel, and of training company supervisors, as well as Caltech students, in management functions.

"The first such center in the United States independent of a university economics department or business school, the Caltech industrial Relations Center has pioneered in teaching supervision and line management to students in both undergraduate and graduate curricula in science and engineering," stated Robert

D. Gray, professor of economics and industrial relations, who has been director of the center since 1940.

Many major companies, including those in such diverse fields as the Times-Mirror Company, Lockheed Aircraft Corporation, Standard Oil of California, Southern California Edison Company, and Title Insurance and Trust Company, have availed themselves of the center's many services and supported it since it was founded 20 years ago.

Anniversary Gathering

With industrial leaders and

educators participating, the center's 25th anniversary was observed in Caltech's new Beckman Auditorium, followed by a dinner at the Biltmore Hotel in Los Angeles.

Speaking at the Beckman meeting was Dr. Simon Ramo, board vice chairman of Thompson Ramo Woodridge, Inc., president of The Bunker-Ramo Corporation, and Caltech trustee; Dr. Mason W. Gross, president of Rutgers University; and J. W. Hull, San Francisco, vice-president-operations, Pacific Telephone and Telegraph Company. Caltech president Lee A. DuBridge gave the welcoming address.

Highlight of the evening program was an address by Lawrence A. Appley, New York president of the American Management Association, Inc., titled "The Future Cannot be Left to Chance."

IRC Offices, Library

The Industrial Relations Center, which started out somewhat modestly in 1939, now occupies a large two-story converted residence at 383 South Hill Avenue on the Caltech campus. The structure contains offices, three air-conditioned conference rooms, and a large industrial relations library used by students of many colleges and universities as well as by Caltech students and representatives of business, industry, and labor.

The center's library is unique in its collection of company materials, employee handbooks, job evaluation plans, and union contracts. It even includes detailed plans on how to conduct company picnics. Many pamphlets and treatises in the library are prepared by staff members or students of the center. Scores of pamphlets, booklets, and monographs on industrial relations subjects, written by the center's staff and students, are widely used in industry.

Fewer Jobs For Bachelors

For the first time in ten years, industry's demands have slackened for scientists and engineers who have only bachelor of science degrees, Dr. Donald S. Clark, director of placements, reported today. "Cutbacks in defense and aerospace industries have eliminated the jobs of many technical people who have only BS degrees," said Clark, also a professor of physical metallurgy. "However, the curtailments do not seem to have affected the jobs of those with PhD and master of science degrees."

Paradoxically, Clark found that while there are fewer job openings for BS people, their starting salaries have continued to increase over the past ten years — although not quite at the rate of PhD starting salaries. Based on salaries accepted by Caltech students who graduated last June, the median for a BS man was \$617 a month, compared with \$375 in 1954. In the same period, the PhD starting salary increased from \$505 to \$900, while the median starting salary for master of science degree men was \$810, compared with \$435 ten years ago.

There were also believed to be fewer summer jobs than in recent years. Clark stated in the placement service's annual report that most of the students obtain summer work in research and educational institutions, sales, chemical and pharmaceutical firms.

New Isotope Handling Laboratory Complete

A \$250,000 underground Isotope Handling Laboratory has been completed in the southwest corner of the campus, for the study of the structure of the atom's nucleus and for the storing and handling of radioactive isotopes.

Incorporating unusual safety features, the 2,700-square-foot structure, designed by Physical Plant's planning and engineering department, is of reinforced concrete, with a roof that is two feet thick. The entire structure is below the ground surface. Special paints and surfacings were used so that they may be readily cleaned. Automatic warning devices have been installed so that no radioactive wastes can escape from the building. Each room is equipped with a carbon dioxide fire-suppressing system capable of quickly flooding each room with gas.

The building includes three research laboratories, a large storage room for isotopes, a decontamination room, elevator, protected storage areas for solid and liquid radioactive wastes, and special air-conditioning and safety-checked air exhaust system.

Janet Jones

The three large laboratory rooms are equipped for preparing samples for delicate research on the investigation of the atom's nucleus. Each room contains at least four stainless steel venti-

lated cabinets. A fifth room is for decontamination. It contains a hand and foot geiger counter, also a shower and wash basin.

The five rooms are continuously monitored for radioactivity, as is the building's air exhaust system. In the unlikely event of difficulty, the ventilation system automatically stops operating. All liquid waste flows into one of two 1,500-gallon holding tanks, where it is monitored for radioactivity. If, as expected, it is safe, it is pumped into the sewer system. If it is contaminated, it is held until safe or pumped into insulated tank trucks for safe disposal.

Any radioactive solid wastes are stored in a separate room. Solid, liquid or gas contaminations trapped on the high efficiency "absolute" filters are removed from the building in heavy containers and disposed of in distant, isolated places.

The new Isotope Handling Laboratory which will augment the "hot lab" that has been in use on campus to provide isotopes for research in various fields, is headed by Dr. Felix Boehm and includes Dr. Rudolf Moessbauer (Nobel laureate) and Dr. Jesse W. M. Dumond (emeritus).

Letters

DuBridge Explains Health Insurance

(Editors' Note: The following is a copy of a letter from Dr. DuBridge which will soon be distributed to all students.)

To all Undergraduate and Graduate Students:

I wish to apologize for the confusion which has resulted from the announcement in regard to the initiation of the new student health and insurance program. It is unfortunate that the initiation of such an excellent program has been marred by the misunderstandings which have resulted. I trust that the following statement will clarify the situation:

For a year or more it has been obvious that the old student health program was becoming more and more inadequate for a number of reasons, among which were:

1. No coverage was provided students during their holiday and vacation periods, times during which accident or illness were quite likely to occur.
2. The emergency student health fund was quite inadequate to insure coverage in case of major medical expenses.
3. No provision was made for covering the dependents of married students.

Long Studies

After a long study by the Student Health Committee, and also by a special ad hoc committee appointed for the purpose, it was decided a few months ago that some improvements in the health program could be made for a rather modest increase in the student health fee of \$15 per student per year. This increase in the health fee was agreed upon by the administration with the recommendation of the Student Health Committee last spring.

However, it was even then evident that, to cover dependents and major medical expenses, some type of insurance plan would be necessary. Rather late in the summer such a plan was finally worked out by the ad hoc committee, and it was their urgent recommendation that this plan be put in effect at once, beginning with the opening of school in the fall of 1964. The cost of this health insurance program would be substantially in excess of the \$15 a year fee which was to be charged to the students. However, the Board of Trustees agreed to underwrite the additional cost of this insurance program, at least for the current year, in order to get the program promptly into effect and to allow time during the current year for studying its

operation. It was anticipated that there would be some problems, particularly for those students who already had some kind of health coverage of their own. During the current year it was expected that these problems would be studied and a more definitive program adopted beginning in the fall of 1965.

Modest Cost

Needless to say, no insurance agency would provide a group health insurance program at such a modest cost unless the entire student body were covered and the insurance agreement was written on this basis. Since the extra cost of the program was underwritten by the Institute, it was felt that there should be no objection to having it compulsory for all students during the first year.

It is hoped that all students who find inequities in the program will report them promptly either to Mr. James Ewart, the Secretary of the Board of Trustees, or to Professor Borsook, Chairman of the Student Health Committee, in the near future. An attempt will be made to correct these inequities during the current year in order that a more satisfactory program may be evolved beginning in 1965.

In the meantime, the students are enjoying for the first time a really adequate student health and medical insurance program at an extremely modest cost. It was only because of our desire to get this program into operation promptly that the arrangements were made rather hastily shortly before school opened — with the resultant inadvertent confusion in the announcements.

Very truly yours,

Lee A. DuBridge
President

Editor:

It has been our experience that both CPS and Blue Shield will give a pro rata refund upon cancellation of a policy. This applies in the State of California and in most other states. Therefore, students who have their own CPS or Blue Shield policies should arrange to cancel their policies and make claim for a refund.

In the case of students who have their own health insurance policies with other insurance companies, it is usually possible to cancel the policy and obtain a short rate refund.

Mr. J. N. Ewart, Secretary of the Institute, will be glad to assist any students who need help in claiming refunds.

Sincerely,

R. B. Gilmore
Vice President for
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More Huff

(Continued from page 2)

education-for-economics attitude stronger among the Indian students than among those he has encountered in the U.S.; when an American undergrad says he is only studying for the money he'll earn later, he is only putting up a "front."

India Compared Again

Another enlightening comparison drawn between American and Indian undergrad campus life concerned the differing social diversions. Indian students almost always proceed on an organizational basis. If something is desired, a club is formed to secure the objectives. Social events at which Indian men and women mix consist of dramatic presentations, musical performances, or debates. Apparently, little desire for "dating" as we know it exists among Indian undergrads, perhaps as a result of the fact that a man's position is more secure on the Indian campus. As Huff explains it, a student spots a girl in one of his classes, "snoops about her family history," and has a friend arrange a marriage proposal between his and her families.

A few of the Indian "sophisticates" know such dances as the twist, and various spots around the larger cities approach the American conception of night clubs. Overall, however, Indian students "are unused to freedom. They are accustomed to authoritarian rule and address faculty supervisors with 'yes, sir' and 'As you wish, sir' and other such stuff when the faculty tries to let them on their own."

India Traveled

These observations on the Indian university situation were gathered in travels through the country, where Huff had many encounters with the Caltech name. The Indian Institute of Science in Bangalor, which is forced to reject 90 percent of its applicants for admission, is headed by a Caltech PhD in Aeronautical Engineering. Huff also arranged to visit the families of a number of Indian students who are attending Caltech.

Before arriving in Calcutta, their first stop in India, Huff and his group first spent four days in Hawaii, nine days in Japan, five days in Hong Kong and two days in Thailand. At each stop, he participated in lectures and discussions concerning the Asian culture, a procedure he termed as "going into Asia by degrees, getting our feet wet by degrees." (The peak was reached in a few

feet of mud in which Huff found himself in one Indian village.)

Impressive Refugees

The tremendous refugee turnover in Calcutta impressed him very much upon his arrival. Refugees from East Pakistan and the city's population together "actually lived on the streets" so that the city was "just bursting." Here were found examples of the really acute problems facing the Indian population today: poverty, lack of housing and lack of motivation.

This last item, lack of motivation, is tremendously difficult to overcome, Huff found in his travels. Combined with the deep seated prejudices of age-old tradition, the problem is almost insurmountable in trying to induce a degree of progress into the Indian situation. A significant understanding gained by Huff was that for the Indian people "stasis is the norm," and change is very unusual. People are extremely reluctant to surpass the subsistence level in agricultural production because, initially, prices will fall. "Only the urban population to some degree is used to change as a mode.

And yet this is only 25 percent of the population."

India Governed

Indian villages are governed by a "panchayat" or council of elders, formerly empowered by heredity but now elected. These councils rule over villages ranging in population from two to five thousand and decide which projects are to be carried out. It is their decision whether a new clinic or a new school is more important.

University syllabus consists of one or two years in a pre-college institution and thereafter entry into either a general or a professional school. After the first two years, absolutely no humanities courses are given in technical options such as engineering. A general course consumes three years, while medicine requires five and a half years and engineering five years.

In closing, Huff noted the great benefits available to American students, especially at Caltech, from an intimate student-faculty relationship. In India, this student-faculty contact is completely stifled, with a resulting loss of educational spirit.

Quotes to Quell Qualms

BY SCHMOCK

Many an underclassman has been worrying about what Fine-man Fizziks and other wondrous courses hold in store. To quell any fears and to establish once and for all that science is neat, a few excerpts from underclass courses are graciously offered herein.

Contrary to the opinions of some, the faculty is concerned with the students. "We do care, but that's irrelevant." You will learn deep truths: "any two numbers differ by a factor." You will find great adherence to rigid derivations: "This fact here we don't know so we pull it out of the air." "Using the general theory of, aah . . . everything . . ."

More Lecture

(Continued from page 1)

To give a broader picture of the research at Caltech, biologists, geologists, engineers, chemists and others were added to the series. Over the years the audience has consisted of high school and college students, teachers, and others interested in science.

For the new series, a faculty

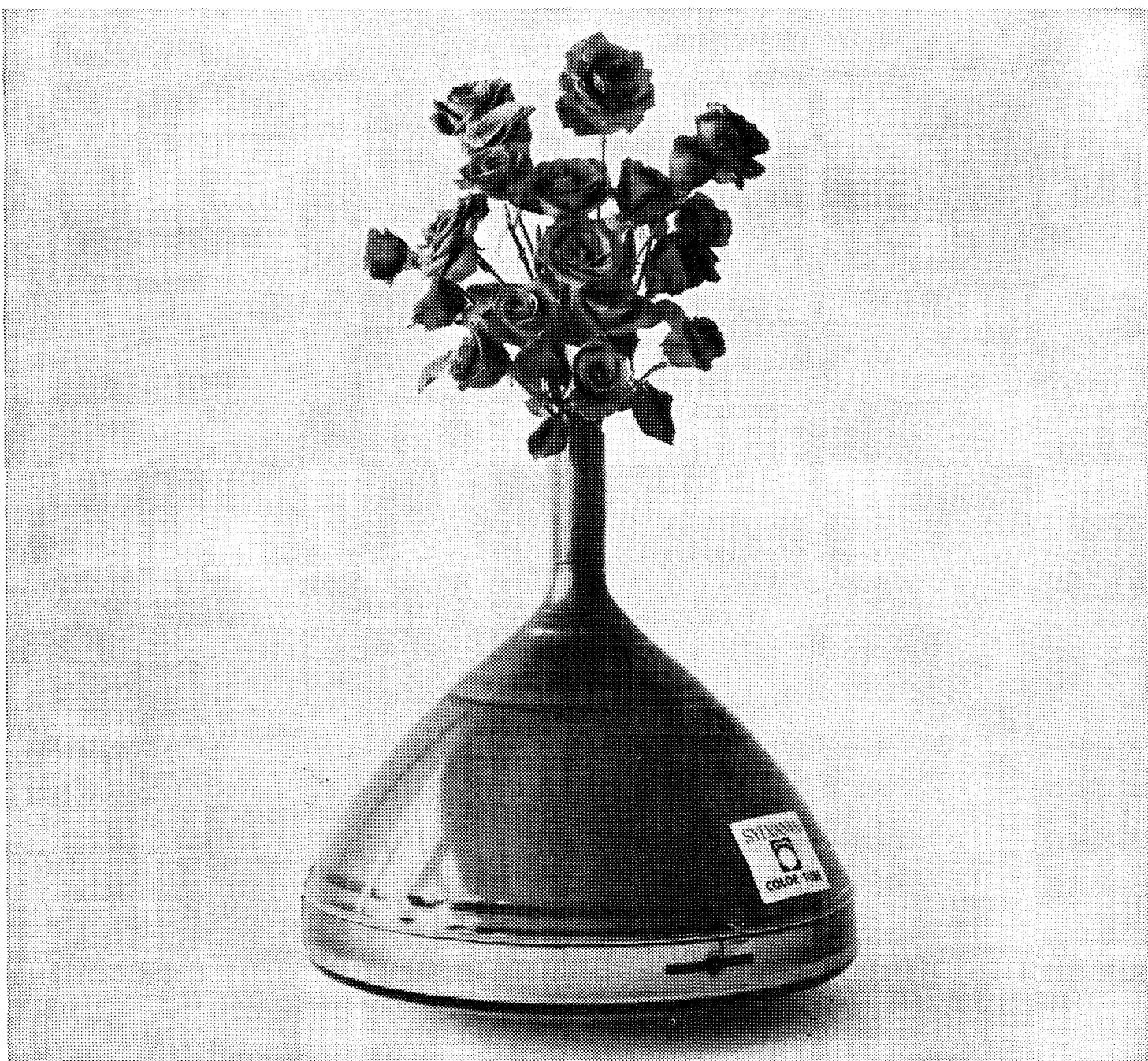
"This is the way I do it. It's illegal, but it's true." "It looks like I have a sign wrong here, but it doesn't matter."

The instructors are always reassuring: for example, take the Ph 2 summary of ferromagnetism: "Ferromagnetism is very complicated." And, "How many hands raised? — (many hands raised) — Good, then you know that it is almost impossible to understand."

But there is one professor on this campus that really does understand underclassmen — Geology's Dr. Robert Sharp: "Going from Caltech to any other school in the country is like going from Hell to Paradise."

committee has been formed to select speakers who will, in a series of a dozen lectures, present a wide range of subject matter on work going on at Caltech. From time to time, scientists and engineers from JPL will discuss phases of space technology.

Season tickets are not available, but persons may obtain tickets for three lectures in advance.



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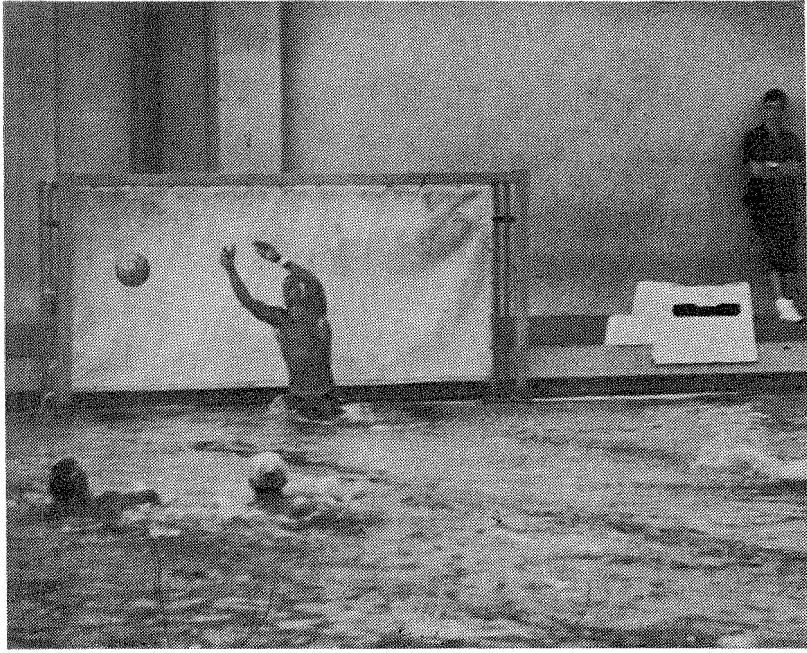
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An Oxy goalie tried in vain to block a Caltech goal during last year's championship game. Watch for some more exciting action this year from the Caltech water polo teams.



BY J. K. EVANS

Hail and farewell, noble sports fans. Here we are for another gay year of blood and gore. So we will start off on the right foot by discussing the origins of football on the American continent.

Contrary to popular belief, football was not introduced to the Americas by Christoforo Colombo of musical fame, although he is well known for his activities in the ball field. Football developed gradually.

It seems that one day Irving Ogg was out hunting and he chanced across a small dinosaur egg. Tucking the egg under his arm, he commenced to make his weary way homeward.

Just outside his cave he dropped the egg; it didn't break. He kicked the egg. It didn't break. He picked it up, hefted it, and called to his wife, who had just appeared out of the cave, "Hey, Irma, tear out for a pass."

He threw the egg. Irma caught it. It broke. All over her new Christian Dinosaur sabretooth-skin jacket with the pleated sides and the tucked front. Irma tore her hair. Irma tore Irving's hair. Irving gave up football.

Walks Right In

However, such a great game could not remain forever undiscovered. It seems that one day Walks-In-The-Darkness, chief of the Oookabollakonga Indians, was walking along the riverbank when he happened to tread on a mushmelon. Becoming angered, he kicked it. Being resilient, the melon bounded across the river and between two upright trees.

Walkie was fascinated. Fetching the melon back, he tried again. Soon he was spending several hours a day practicing field goals, and most of the young men of the tribe were neglecting their bow-and-arrow practice to kick melons. A great future was in store for the nation; unfortunately, one day in the middle of melon practice, the neighboring warlike Ferocianato Indians attacked and, caught with their bows down, the Oookabollakonga were wiped out to the last melon. Football was dealt another devastating blow.

Bullback

But all was not lost. It seems that one day Erwin Hodspitter was walking along the path from the barn, when he noted that his infant son, wearing a red nightgown, was crawling through the fence into the bull pasture. Erwin leaped the fence and snatched up the child; however, the bulls had already noticed. Tucking the child under one arm, Erwin ran across the pasture, nimbly dodging the charges of the infuriated bulls. He reached the fence unscathed.

In retrospect, Erwin realized that his exertion had been an exhilarating experience, and he began making at least one jaunt a day across the pasture with a red pillow under his arm, delicately avoiding the bulls with clever changes of pace and cut-backs. People came from miles around to watch Erwin and exclaim in awe, "Look at the way he runs across that broken field." Unfortunately, one day Erwin slipped on a particularly large pile of you-know-what, and the bulls trampled him to a bloody pulp.

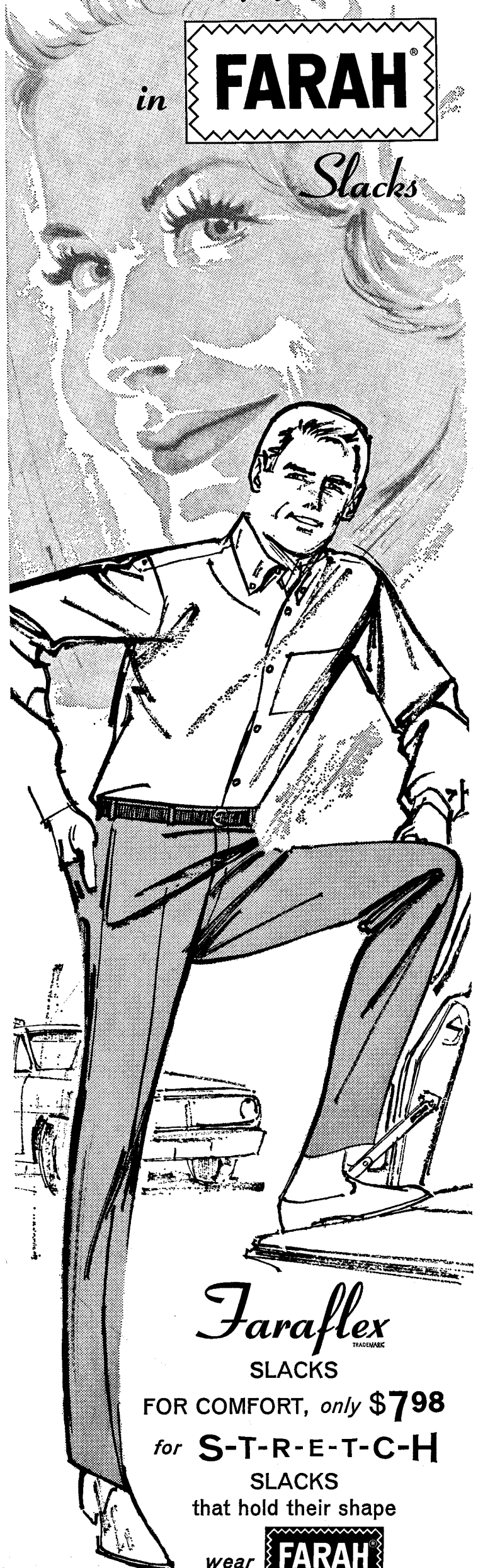
With a sound base of all-time greats such as these early superstars in passing, kicking, and broken field running, it is little wonder that American football has developed to the apex reached here at Caltech.

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Webmen Lose To OCC, Then Defeat Alumni

In its initial encounter the Caltech water polo team was defeated by a fast swimming Orange Coast group 13-2. The Beaver squad played well until half-time, holding their opponents to only 4 goals. Actually, the varsity controlled the ball well but wild shooting plagued the forwards. John Walter finally scored the 2 goals late in the game when Orange Coast was well ahead. Although the score does not show it, the varsity squad did play well, indicating a bright future.

After only three days of practice, the frosh team encountered the Orange Coast B team and lost 19-0. The freshman team was hurt most by a lack of experience, but it is still too early to make any predictions.

Varsity Defeat Alumni

Last Saturday the varsity defeated the Alumni, their second opponent, 8-5. Tom Crocker and Mike McCammon from last year's varsity squad were the most impressive players for the Alumni. The Alumni played hard for the first half, but a lack of endurance characterized their players as they fell behind in the second half. Rick Nielsen and Ted Jenkins scored two

goals each while the other goals were split among the remaining players of the squad.

Although it was too late to include in this article, the freshmen played PCC on Tuesday and the Varsity played L.A. State on Wednesday. On Tuesday, October 13, the varsity will host San Fernando Valley State at 4 p.m. Following that game will be an encounter between the Caltech frosh and Mt. SAC. On Wednesday, Oct. 14, the frosh and varsity travel to El Camino. Come out and support your teams.

WE NEED YOU

At the time of this writing there are only 21 players on the Caltech varsity football team. Unless more players come out for the team, there is a distinct possibility that the season will be terminated. This shameful situation may be remedied only by having more students turn out for varsity football. Once again, all able upperclassmen and sophomores are urgently requested to consider the possibility of playing varsity football.

Soccer Team Beats Redlands

The Caltech soccer team bested the Redlands team 7-3 last Saturday in an afternoon game. As predicted, the game was characterized by Caltech's lack of training and conditioning. Although the score was 4-2 Caltech at halftime, Redlands was decidedly in control of the game. Outstanding for the Redlands team was the performance of the center halfback, Joe Li.

In the last half of the game, Coach Andrew freely experimented with the lineup in an attempt to form a more coordi-

nated team and to neutralize the efforts of Joe Li. He succeeded. Caltech took control of the game and outscored their opponents 3-1. Caltech goals were scored by the following players: Yilmas, three; Trischek, two; Argyropoulos, one; and Hunsaker, one.

Students are still urged to join the J.V. and Varsity teams. Frosh and sophomores desiring an easy way out of P.E. requirements are heartily encouraged to come out for soccer manager positions to help Mike Woof calibrate the team.

Next Week's Sporting Events

| | | |
|---------------|-----------|--------------------------------|
| Sat. Oct. 10 | 2 p.m. | L. A. Pacific at Caltech |
| | | VARSITY SOCCER |
| Sat. Oct. 10 | 9:30 a.m. | Biola at Biola |
| Wed. Oct. 14 | 3 p.m. | UC Riverside at Riverside |
| | | JUNIOR VARSITY SOCCER |
| Sat. Oct. 10 | 9:30 a.m. | Biola at Biola |
| | | VARSITY WATER POLO |
| Fri. Oct. 9 | 4 p.m. | Cerritos at Norwalk |
| Tues. Oct. 13 | 4 p.m. | S.F. Valley State at Caltech |
| Wed. Oct. 14 | 4 p.m. | El Camino College at El Camino |
| | | FROSH WATER POLO |
| Tues. Oct. 13 | 5 p.m. | Mt. SAC at Caltech |
| Wed. Oct. 14 | 4 p.m. | El Camino College at El Camino |

QSRSs Investigated

A recent report on the research of astrophysicist Jesse L. Greenstein and astronomer Maarten Schmidt sheds new light on the mysterious quasi-stellar radio sources. Their detailed analyses seem to test the credibility of the known laws of physics.

Astronomers are excited about the quasi-stellar radio sources (QSRS's) for two principal reasons. First, they are a new kind of astronomical objects. More importantly, they may make it possible to determine the dimensions and geometry of the universe because their unprecedented brightness enables astronomers to see farther into space than was thought possible. Recently one of the 20 or so suspected

quasi-stellar sources, 3C-147, was found to be the most distant known object in the universe—many billion light years away.

Although QSRS's are the brightest objects in the universe, their light comes from a region much smaller than a typical galaxy. Even though it is 100 times brighter than our entire Milky Way Galaxy, 3C-273 is believed to be only one fifteen-hundredth of the Milky Way's diameter. In addition to light, QSRS's also radiate enormous amounts of energy in the longer wave-lengths of the radio spectrum.

Structure, Maybe

From data obtained by themselves and others, Greenstein and

Schmidt concluded that a QSRS probably consists, essentially, of three parts. There is a small, central, optically invisible core that contains virtually all of the matter, perhaps that equivalent to more than a billion suns. Its existence must be deduced from observations of the visible regions.

Surrounding this invisible core is a visible gas sphere with rapid internal motions and ranging in diameter from seven light years for 3C-273 to 70 light years for 3C-48. The gas sphere, in turn, is surrounded by an invisible sphere of highly energetic electrons that move virtually at the velocity of light. Electrons in this state and trapped in magnetic fields emit synchrotron radiation. This evidently is the source of the radio emission.

3C-273 appears in 80-year-old Harvard Observatory Sky Patrol photographic plates and was presumed to be an ordinary star. Neither it nor other QSRS's attracted attention until Dr. Thomas A. Matthews of Caltech's Owen Valley Radio Observatory, working with Dr. Allan R. Sandage of the Mt. Wilson and Palomar Observatories, and Dr. Schmidt, noted the peculiar correlation of strong radio emission with a star-like object.

Schmidt obtained a spectrum of 3C-273. To his astonishment, the spectral lines were shifted 16 per cent toward the red end of the spectrum. Greenstein obtained spectra of 3C-48 showing an even greater red shift — 37 per cent.

New Information

In their new analyses, Green-

stein and Schmidt considered all known possibilities for the origin of the extraordinary red shift and concluded it was due to the fact that, although the two objects look like stars within our galaxies, they must indeed be very far beyond the Milky Way and receding from it at many tens of thousands of miles a second.

The diameter of the two QSRS's were considered. Their optically visible regions must be quite small because their light fluctuates. The light from 3C-273 has been observed to fluctuate about one half a magnitude in ten years. Photographic records show that 3C-273 dropped sharply in brightness in 1929 and resumed its "normal" brightness in 1940.



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