Owen, Carsten's Speak on Rights

David Owen and Betty Carsten, two of the student civil rights workers who went to Mississippi this summer, spoke to a group of about 80 students in Calvin Library last Monday evening, concluding the assembly hour. Titled "Mississippi - the Long Hot Summer," the hour-long presentation from the ASCPT - Alumni assembly service, was designed to help Carstens try to explain the actual conditions in Mississippi as they experienced them personally.

Owen, son of Dr. Bay 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 very wealthy, and on the most part they have not finished high school. Thus the authorities can depend especially on the Negroes to do the work of slavery and exploitation of the Negro is easy.

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 South in large numbers, especially those with college educations.

The elections in Mississippi, especially on the registration attempts, and offer no protection to the Negro and no real liberties. Without voting, Negroes are determined to win.

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

It was in this atmosphere that the voter registration project began. However, there were workers trying to convince the Negro voters of the necessity for their registration if change was to come. Now and then, Negroes without cases. Even after intense pressure against voting, one registration attempt has drawn 200 out of 3,000 applicants. And now that the workers have gone home, it is hoped that, somehow, how will the Negro be able to protect his hard-won right to vote and win in an active and only time can answer.

Mississippi is a poor, rural, and uneducated state. The people have not experienced them personally.

To help the voter registration, the Freedom School taught typing, business skills, 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. The workers had a fair share of party registration; but in the end they realized the limitations tended to frustrate. Still, in spite of the frustrations, the people were determined to win their rights.

"Mississippi - the Long Hot Summer" was presented by the Student Assembly of Caltech, with the cooperation of the Student Activities Council and the Caltech Student Council. The program was sponsored by the ASCPT - Alumni assembly service.

(Continued on page 5)

Chamber Music Begins Sunday

The Caltech Chamber Music Series begins its fifteenth season Sunday, October 12, at 8:30 p.m., with a performance by the Los Angeles Philharmonic, ext. 722 or 574-1794.

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 lighted by a flawless presentation of "A Streetcar Named Desire" and - if it is possible - an even more flawless presentation of yet another Tennessee Williams classic, "Cat on a Hot Tin Roof." It was a season that will go down in the annals of Caltech as one of its finest, and the third season of the present troupe, which was organized under the leadership of Dr. J. Harold Wayland, chairman of the drama department, promises to reach new heights.

And don't forget: if you are in the play, you get to come to the cast party (parties). For more information, see Dr. Wayland in Oivia 49, or call 574-1794.

Tryouts will be held this Tuesday, October 12, from 3 to 5 p.m.; and Wednesday, October 13, from 3 to 5 p.m., in Carll room. No experience is necessary. Those who are interested are invited to come. For more information, call 574-1794.

Dr. Stern

Dr. Arnold 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 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 for the 6th Annual Student Festival held 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 Philosophy of Laughter and Tears, and Sortie - his Philosophy and Psychosynthesis.

Tryouts will be held this Saturday, October 10, from 9 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 Whitehead. 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 play-like action.

If you are interested, or your father-in-law, or your sorority sister, or you met in Pershing Square last year have any aspirations at all toward theatrical expression, we invite you to be present Saturday, Sunday, and Monday for this momentous and pedagogical occasion.

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(Continued on page 5)
From Other Campuses
By Jace

Last week this column featured a story on the successful special elections which took place at Antioch College (Yellow Springs, Ohio). I soon discovered, however, that depend­able MIT voting was not evading quest for perfection. Had I bet­tered even that total muscle of confusion?

Consider the saga of MIT's Tech Engineering News maga­zine, known affectionately 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 positions, and 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 pro­vided 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 another "provision" of the constitution, this one providing that three members of a board (constisting of General Manager, Editor-in-Chief, Managing Editor, and Business Manager) could im­pose a fourth.

Who's on the board? "By this time, however, no one was quite sure who was on the Managing Board. The im­mense at this point that things fly adoned, appealed the board's power, yet there has been sufficient interest to gather a team. If there are too few players, Coach LaB has the authority to cancel the team. So far only 21 men have ever played football or have ever wanted to play to see Coach LaB in action. Eight to ten new members are expected in the next few days which will make the difference.

Duddy Speaks
Our opening day was beauti­ful; the westhust will have heard of the reception, for that afternoon, I toured the city and visited some of the most beauti­ful buildings I had ever encountered. The pretty streets of Washington were gorgeous, especially with sunlight on its sky and the sky so blue and cloudless.
At 5 p.m. I entered the White House, after being checked and rechecked on a list of guests. We were ushered upstairs into the East Room. There Dean Rusk, Robert McNamara and William Shultz spoke to us—me and 200 other. 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 25 to 35 years of age and from all kinds of professions, will work under the Vice President, Cabinet members, and in the White House staff. They will serve for 15 months and will see and experience the world of government. It is to be financed by the Carnegie Foundation; I was pleased to hear this won't be out of our tax dollars.

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

Student's Perspective
Garrison Writes on LBJ

It all began on registration Day as I was enjoying myself on the beach at Santa Monica. That afternoon President Lyndon B. Johnson received an invitation from the Student Council of MIT to visit the Institute. I was chosen to represent a non-political reception to the President.

I was finally tracked down and confronted with the invita­tion. With some misgivings (I hated to leave the cool air and the languid sun on my face) I hopped a jet to our na­tion's capital. I was there on the evening, October 2. It was rain­ing and gloomy, and I was with­out a car.

It was a day of activity. After our part in this year's' seminar, we partook in the election were members of the board. Unfortu­nately, one was quite sure who was on the board to. The im­mense at this point that things fly adoned, appealed the board's power, yet there has been sufficient interest to gather a team. If there are too few players, Coach LaB has the authority to cancel the team. So far only 21 men have ever played football or have ever wanted to play to see Coach LaB in action. Eight to ten new members are expected in the next few days which will make the difference.

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Letters

DuBridge Explains Health Insurance

(Editors' Note: The following is a brief excerpt of a letter from Dr. R. B. DuBridge which will soon be distributed to all students. DuBridge is writing in regard to the student health insurance program.)

Dear Undergraduate and Graduate Students:

I wish to apologize for the confusion and misunderstanding that resulted from the announcement in regard to the student health insurance program. It is unfortunate that the initial advertisement for the program was marred by the misunderstanding which has resulted. In that the following statement will clarify the situation:

For a year or more it has been obvious that the old student health insurance 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 times during which accident or illness was quite likely to occur.

2. The emergency student health insurance program 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 of this study by the Student Health Committee, and also by a special ad hoc committee appointed by the Trustees, established the need for a health insurance program. It was decided a few months ago that the health fee, which is required for the health program could be made for a rather modest increase in the student health fee of $1 per student per year. This increase in the fee was approved by the administration with the recommendation of the Student Health Committee.

However, it was even then evident that the program would have to provide adequate and major medical expenses, some catastrophic coverage, and adequate coverage for dependents. This program would be necessary. Rather late in the summer such a plan was finally worked out and submitted to the Trustees, and was approved by the Trustees, and was presented to the student body for approval. This program has been underwritten by the Student Health Committee.

Very truly yours,

Lee A. DuBridge
President

New Isotope Handling Laboratory Complete

A $260,000 underground Iso­
type Handling Laboratory has been completed in the southeast corner of the Chemistry Building 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 2,250-square-foot, structure, designed by Physical Plant and engineering, was completed in the fall of 1960.

A highlight of the evening pro­gram was an address by Law­rence A. Appley, New York pres­ident of the National Science Associa­tion, Inc., titled "The Future Cannot Be Left to Chance."

HUC Offices, Library

The industrial office center in Los Angeles, which was completed in 1960, now occupies a 14,000 square foot building located at 331 South Hill Avenue on the Caltech campus. The center is a three-level, air-conditioned conference room, with all the usual services, and the library used by students of many colleges and universities as well as those of the Caltech staff and re­presentatives of business, industry, and labor.

The library is unique in its collection of company ma­terials, employee handbooks, job specifications, and the like, as well as contracts. It also includes detailed plans of 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.

What every son should tell his father!

More Music

(Continued from page 1) The Philharmonic Orchestra, Kahgen and Lin are the American national anthem. The "Stars and Stripes Forever" was performed by the Caltech Orchestra, the "Union National March" was played by the Caltech Orchestra, and the "National March" was played by the Caltech Orchestra.

For the first time in ten years, the Caltech Orchestra has been invited to perform at the Caltech campus. The orchestra will perform at the Caltech campus on Saturday, May 1, at 8:00 PM. The program will include "The Star Spangled Banner," "The Battle Hymn of the Republic," and "The American National March." The Caltech Orchestra will be conducted by Dr. Donald S. Smith. The orchestra will perform a variety of music, ranging from classical to contemporary, including works by Beethoven, Mozart, and Brahms. The concert will be held in the newly constructed Isotope Handling Laboratory, which was completed last year. The audience will be seated in a comfortable, modern auditorium. The concert will conclude with a grand finale featuring "The Star Spangled Banner."
edication and economic disadvantage strongest among the Indian students than among those he has encountered in the U.S., when an American undergraduate says he is not worrying about the future he'll earn later, he is only putting up a "front."

India Compared Again
Another enlightening comparison drawn between American and Indian undergraduates here concerned the differing social divisions, Indian students being instantly assigned to 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 "dates" as we know it exists among Indian undergraduates, 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, "smokes about her family history," and has a friend arrange a marriage proposal between the two.

A few of the Indian "sophisticates" know such dances as the twist, and various spots around the larger cities approach the American conception of nightlife. 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 as far as such stuff when the faculty tries to tell 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 Bangalore, which is forced to reject 90 percent of its applicants for admission, is headed by a Caltech Ph.D 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, they participated in lectures and discussions concerning the Asian culture, a procedure he termed as "going into Asia by degrees, putting our feet wet by degrees." (The peak was reached in a few feet of mud in which Huff found himself in one Indian village.) Impressively 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, "status is the norm," and change is very unusual. People are extremely reluctant to surpass the existence 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 college 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 stilted, with a resulting loss of educational spirit.

Dee Schmock
Many an undergraduate has been worrying about what Fine-sean Plante and other woodrose courses hold in store. To quell any fears and to establish once and for all that science is past, a few excerpts from underclass courses are gladly offered hereafter.

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 coherence to rigid derivations: "This fact here we don't know so we pull it out of the air." Using the general theory of s on... 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 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.

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

The Color TV market is in full bloom—and GT&E along with it.

The reason? Our Sylvania subsidiary has made dramatic advances in performance standards of color TV sets.

In developing these new receivers, Sylvania drew upon the vast research facility of GT&E. One result: the Sylvania "Color Bright 85" picture tube using a revolutionary new red phosphor that increases brightness on the average of 43 percent over the industry standard.

Our Sylvania Electronic Components Group is one of the two largest suppliers of receiving tubes and picture tubes... used by 7 out of 10 TV set makers.

As a major factor in all phases of communication, sight and sound, it is small wonder that GT&E has become one of America's foremost corporations. If you're looking for a young, aggressive company with no limit to its growth, you may wish to view GT&E in the light of your own future.

"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 have read the text?"—(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."
**Webmen Lose To OCC, Then Defeat Alumni**

In its initial encounter the Caltech water polo team was defeated by a fast swimming Orange Coast team 13-2. The forwards played well until halftime, holding their opponents to only 4 goals. Actually the varsity controlled the ball well but wild shooting plagued the forwards. John Walker finally scored the 2 goals late in the game when Orange Coast was well behind. 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 18-6. The freshman team was hurt most by a lack of experience, and it is still too early to make any predictions.

**WE NEED YOU**

At the time of 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 situation may be remedied only by having more students turn out for varsity football. Once again the Caltech varsity football team played their opening game against the Alumni and defeated them 19-0. The varsity team was the performance of the center halfback, Joe Ll.

In the last half of the game,出现Andr made several changes in阵线，emended with the lineup in an attempt to form a more coordinated team and to neutralize the efforts of Joe Ll. He succeeded. Caltech took control of the game and outscored their opponents 31-9. Caltech goals were scored by the following players: Tilmus, three; Prichard, two; Argyro- poulos, one; and Hunsaker, one. Students are urged to join the varsity team. Fresh and sophomore positions are urgently requested to consider the possibility of playing varsity football.

**Next Week’s Sporting Events**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Sat. Oct. 10</td>
<td>VARSITY FOOTBALL</td>
<td>2 p.m.</td>
<td>L. A. Pacific at Caltech</td>
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<tr>
<td>Sat. Oct. 10</td>
<td>VARSITY SOCCER</td>
<td>9:30 a.m.</td>
<td>Biola at Biola</td>
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<tr>
<td>Wed. Oct. 14</td>
<td>UC Riverside at Riverside</td>
<td>3 p.m.</td>
<td>Biola at Biola</td>
</tr>
<tr>
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<td>VARSITY WATER POLO</td>
<td>9:30 a.m.</td>
<td>Biola at Biola</td>
</tr>
<tr>
<td>Fri. Oct. 9</td>
<td>VARSITY WATER POLO</td>
<td>5:30 p.m.</td>
<td>Biola at Biola</td>
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<tr>
<td>Tue. Oct. 13</td>
<td>JUNIOR VARSITY SOCCER</td>
<td>4 p.m.</td>
<td>Biola at Biola</td>
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**Soccer Team Beats Redlands**

The Caltech soccer team bested the Redlands team 3-1 last Saturday in an afternoon game. As predicted, the game was characterized by Caltech’s lack of training and conditioning. Although the score was 3 to 1, Caltech at halftime, Redlands were definitely in control of the game. Outstanding for the Redlands team was the performance of their center halfback, Joe Ll.

In the last half of the game, Cookie avoided a trap in the middle of the field that led to the team’s goal. The Caltech team was not able to get a run of any consequence until the middle of the second half. John Nielsen and Ted Jenkins scored two goals each while the other goals were scored among the remaining players of the squad.

Although it was too late to include in this article, the forwards 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 a match 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.

**Relax and enjoy yourself in FARAH Slacks**

Faraflex SLACKS

FOR COMFORT, only $7.98 for S-T-R-E-T-C-H SLACKS that hold their shape wear FARAH

**BY J. K. EVANS**

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

Contrary to popular belief, football was not introduced to the Americas by Chistoforo Colombo. 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 it. 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 Dior suit, Irma tore Irving’s hair. Irving gave up football.

**Walkie Right In**

However, such a great game could not remain forever undiscovered. It seems that one day Walkie-In-The-Darkness, chief of the Ooakabollakonga Indians, was walking along a river bank when he happened to tread on a melon. 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 Pecosanian Indians attacked and, caught with their bows down, the Ooakabollakonga were wiped out to the last melon. Football was dealt another devastating blow.

**Back to Cool**

But all was not lost. It seems that one day Erwin Hodspitter was walking along the fence when, to his horror, he turned to watch Erwin Hodspitter and noticed that the melon was not a melon but a ball. So was born American football.

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

A recent report on the research of astrophysicist Jesse L. Greenstein and astronomer Maarton 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. Grenstein obtained spectra of 3C-48 showing an even greater red shift — 37 per cent.

New Information

In their new analyses, Greenstein 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.