Tech Scores First Televised RF

Dr. Beadle To Head U. of Chicago

By Cleve Moler

The bare place of campus west of the new Student Houses will not be bare very long. Finally, after a year of planning, the Student Center are being completed and construction will probably begin later on in the term.

Winnett Center, which will occupy the area that formerly boasted the Old Dorm, Throop Club and the Original Groovy, was donated by P. G. Winnett, chairman of the board of Bullock, Inc., and a longtime member of the Caltech Board of Trustees.

The Center will be one of the final buildings to be built under the Institute’s three-year-old development campaign. The buildings have already been completed, seven more are in various stages of construction and three — Winnett Center, Beckman Auditorium and Millikan Memorial Library — are still on the drawing board.

Scheduled for completion in a little over a year, the Center will include a large lounge, offices for student groups and organizations, a new bookstore, and student shop and recreation facilities.

The basement of the new building will contain the wood-working, metal, electrical and print shops and a fairly large game room with pool, ping pong, card and other equipment.

On the ground floor of the air-conditioned structure will be a large lounge and the offices and darkrooms for the California Tech and Big T. Also on the ground floor will be a greatly expanded version of the bookstore and permanent quarters for the new traveling barber shop. The new bookstore will be organized on a self-service basis.

The second floor of Winnett Center will include offices and meeting rooms for ASCIT, the radio club, the Inter-Nations Association and various other clubs. There will be a large, general purpose meeting room and storage space for club use.

Caltech’s YMCA will also find a permanent home on the second floor of the Center. There will be a combined Y-ASCIT work room with mimeograph and ditto facilities.

DuBridge Calls Nobel Laureate 'Irreplaceable'

Dr. George Beadle, Dean of Faculty, will leave Caltech late this term to become Chancellor of the University of Chicago. No names have been mentioned as yet to succeed him as Dean and Chairman of the Biology Division.

In accepting the leadership of the University of Chicago, Beadle assured Caltech that he was "grateful to have been here and to have had a small part in its growth during these past 14 years."

"Leaving it is painful," he remarked. "Caltech is a wonderful place."

Looking ahead, he continued, "Chicago is a great institution, too, one with a great history of educational leadership. Its future is exciting to contemplate, and I am looking forward with enthusiasm to making whatever contribution I can."

Beadle is credited with making revolutionary discoveries on the role of the gene in biology for which he won a Nobel Prize last year and this year been selected to receive the country's 10 top biologists and by Time magazine as one of the country's 10 top biologists and of the year's "Men of the Year" award.

His first discovery in 1936 was that a gene controls the eye color of the fruit fly by producing a particular chemical substance.

Then in 1941 at Stanford University, together with Dr. Edward L. Tatum, now of the Rockefeller Institute, and Dr. Beadle found that the genes control the synthesis of vitamins and amino acids. Since then, Beadle has clarified wide areas of biology and opened rich new fields for investigation.

"It led to a new knowledge of the genes and of biochemistry," said Dr. Norman Horowitz, Caltech biology professor who has been associated with Dr. Beadle since 1952. "It made possible for the first time the study of the genetics of bacteria. And it led to the application in several laboratories of the genetic principles to increase food and the production of penicillin during World War II."

Beadle is chairman of the American Cancer Society's Scientific Advisory Council and chairman of the National Academy of Science's Committee on the Genetic Effects of Atomic Radiation.

IHC Initiates Rotation Talks

The IHC is studying the pros and cons of rotation to aid their decision on its advisability for next year.

Their first step will be an informal poll in each House. The House presidents will sample student opinion on the subject at a meal this week.

In addition, faculty and administration members will be invited to the weekly IHC meetings to offer their ideas.

To facilitate discussion, the IHC plans to organize the sub-ject matter of each meeting in advance. The committee should then decide in five or six weeks.

Best Wishes

The University of Chicago is to be sincerely congratulated on securing as its head a scholar, teacher, and administrator as George W. Beadle. Under his leadership the University of Chicago, already one of the nation's great educational institutions, is certain to go forward to an even higher educational distinction. The whole nation will profit from such a development.

At the same time, the loss of Dr. Beadle in so important a blow to Caltech. In the past fourteen years he has built here one of the greatest research centers in biological science in the country and he has brought to this institution the full range of research and educational advancement. He cannot be replaced.

Dr. and Mrs. Beadle were beloved members of the Caltech faculty and they carried with them into their new en-dorsements the best wishes of a host of friends and admirers in Southern California.

—L. A. DuBridge

IHC Plans To Fill Vacancies

There are now two vacancies on the BOD. Any student interested in the office of Athletic Manager or Representative at Large should consider himself a member of the BOD.

Volume LXII.
Pasadena, California, Friday, January 6, 1961
Number 12

California Tech

Associated Students of the California Institute of Technology
Washington Baffled By Prank

(Continued from page 1)

knew the band was at Disneyland — so they borrowed the master plans. The master plans are large pieces of graph paper colored in the way the stunts appear, and they were stored in the same satchel that the stunt-director kept his cigarettes. ("Sweaty," as one man put it.)

Escaping to the sanctuary of Lloyd House, the villains spread the master plans. The master plans were large pieces of graph paper and - so they borrowed the rect cards for the old and right 14, they would have lost, since Flush)

and 12. Had they picked 13 or 14, they would have lost, since those were optional and were not done.

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Disarmament Talks Slated

The Carnegie Series for the second term will continue as it did during the first term. Speakers who are planned for this term are:

Thursday, January 5, 1:00 p.m. -
Dalney Lounge. Professor C. E. Osgood, "Psychological Aspects of Policy Formation."

Friday, January 13, 1:00 p.m. -
Dalney Lounge. Professor Jerome D. Wiemer (to be announced).

Wednesday, January 18, 8:15 p.m. -
Caltech Hall. Professor Tom Schelling, "Arms Control and Military Strategy."

Wednesday, January 25, 8:15 p.m. -
Culbertson Hall. John Bra­choy, "British Attitudes to the Deterrent."

Thursday, February 2, 1:00 p.m. -
Dalney Lounge. Dr. Leo Slatand (asked).

Friday, February 10, 1:00 p.m. -
Dalney Lounge. Professor Kenneth Bowdler, "Conflict Resolution."

Thursday, February 16, 1:00 p.m. -
Dalney Lounge. Mr. Dennis Hailey (House of Commons), "NATO Strategy and Arms Control."

Thursday, February 23, 1:00 p.m. -
Dalney Lounge. Professor Daniel Lerner, "European Defense Attitude."

Thursday, March 2, 1:00 p.m. -

Wednesday, March 8, 8:15 p.m. -
Calberton Hall. Erich Fromm (asked).

Wednesday, March 15, 8:15 p.m.

Pauling, Beadle Named As Time ‘Men of The Year’

Dr. Linus Pauling and Dr. George Beadle, Caltech professors, and Dr. Donald Glaser and Dr. William Shockley, who stud­ied at Caltech, are among the 15 scientists named as Men of The Year by Time Magazine.

The article outlined the mar­vel developments in science dur­ing 1960. Included in this were Caltech's work on DNA and in radio astronomy.

Beadle received his Nobel Prize for his work in genetics; Pauling for his work on the chemical bond. Glaser invented a bubble chamber for photo­graphing atomic particles; Shock­ley invented the transistor.

Pauling and Beadle were men­tioned as having done signifi­cant work on DNA and proteins. Both of them commended on the significance of the work on DNA.

Dr. Murray Gell-Mann, not named as one of the select 15, nevertheless was called “one of the brightest new stars of U.S. science.” There was a short quote by Gell-Mann on the work of physics.

A few paragraphs were devoted to the aims of radio astron­omy. Next mention was made that Caltech was largely respon­sible for many of the achieve­ments listed. Palomar was men­tioned, however, for the photo­graphing of two colliding galax­ies, six billion light years from the earth.

—Culbertson Hall. Professor I. I. Rabi and Sir Solly Zuck­er­man, “Science and Public Pol­icy.”

PIONEERING IN SPACE RESEARCH VIA SPACECRAFT

Since the beginning of his intellectual awareness, Man has looked upward to the outer void surrounding his planet Earth. He has watched the twinkling stars and wondered at the never-ending dance of the planets around the Sun. He has dreamed and written of the possibility of exploring outer space and speculated endlessly on what he might find could he but explore those silent spheres.

A practical beginning to this century long yearnings has already been accomplished with man-made satellites already girdling the Earth.

The National Aeronautics and Space Administration has assigned Caltech’s Jet Propulsion Laboratory (JPL) the responsibility for the Nation’s program of unmanned lunar, planetary, and interplanetary exploration. The objectives of this program are to contribute to mankind’s fundamental knowledge of the universe and to the development of the technology of space exploration. For the next ten years, as larger booster vehicles become available, spacecraft with even-increasing scientific instrument payloads will be developed.

JPL will conduct the missions, utilizing these spacecraft to orbit and land on the Moon, to probe interplanetary space, and to orbit and land on the near and far planets.

Earliest of these spacecraft will be the “Ranger” series now being designed, developed and tested at JPL. The mission of this particular series will include first, exploration of the environment and later the landing of instru­ment packages on the Moon.

Subsequent steps will continue a constant probing for the knowledge of what is beyond and will require all the skills, ingenuity, courage, endurance, perception and imagination that man can bring to the task.

Never before has there such a wide vista of opportunity, or a greater incentive been open to men trained in all fields of modern science and engineering. Every day at JPL, new problems arise, new theories are advanced, new methods tried, new materials used, and new principles discovered. Wouldn’t you like to be part of this exciting activity?
Surprise

Campus Secretaries Find Their Bosses Faultless

BY BILL MEHRI

With just the right amount of charm, good humor, and versa-
tility a dedicated band of office, and 'she never gets ahead
there is no end of work in the
very understanding." Although
he wouldn't get
found in their back yard and
ning eggs (around Easter).,
woman who typed up the
problems. Her name is Betty
professors, and reminding her
she is secretary to both Dean
and gets most of her sCience
est
full of their 'life's work, and
ask for medical advice, or to
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Various
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Seven years ago Dr. Bell re-
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DuBridge Tells Problems Of Educating Technicians

scribed both the Caltech curriculum and the educational body as outstanding, yet still quite a problem to the faculty.

In his introduction to the 1960-61 Annual Report:

Several previous reports have discussed the problem involved in adapting our academic policies to the increasing need for academic growth and the increasing intellectual capacities of the undergraduate students.

In selecting a constant number of freshmen each year from an enormous and an ever-better group of applicants, we have attained a student body which, judged on the basis of entrance examinations and high school records, cannot be surpassed in the country.

These students need and expect an exceptional educational program. We try to provide it—by means of new and improved methods. Even if full and unqualified, we face the problem, there is no other pathway of progress.

THE PROBLEM OF THE LARGE INSTITUTE

A special problem has to do with the degree to which specific rules and requirements relate to classes, courses, grades, examinations, electives, etc., can be reduced or abandoned for such degrees. If the students were all as wise and as ambitious as they are industrious, there would be no problem; all requirements would be lifted and the student left completely free to outline and pursue the educational program best suited to him.

But in scientific and engineering fields some systematic sequence is essential, some intellectual cohesion is required, and experienced judgment is required in selecting and combining all the essential elements plus the required breadth. To my mind, this point is clear in principle, up and experience are clearly called for—and faculty guidance can be impossible if the course is not well planned through a set of rules and regulations.

The problems are, how to keep up standards in harmony with changing circumstances and how to leave these students sufficiently flexible to take care of individual needs and talents.

FORTY-FIVE PER CENT FAIL

The fact that our freshman class is as highly selected as any in the country makes it a puzzle why from 10 to 14 per cent still drop out at the end of the first year, even though 60 to 75 per cent fail to graduate with a later class. As institutions go, an academic failure rate over four years of 28 per cent is not great. Yet this is the mark we think we are selecting should not fail at all, nor should so many require more than four years to graduate. We should insist that the voluntary withdrawal be so heavy—often representing some type of dissatisfaction or discouragement. While extensive inquiries into these matters have been undertaken, and many changes in curricula and student activities have been initiated, the problem has not yet been solved. Possibly we are in this instance at the limit of the possibility of predicting—by any selective mechanism—human ability, interest and belief, patterns of a 17-year-old boy. We have hope that the campus spirit can be an improved spirit on the campus this fall and most upperclassmen to live on the campus. We are also encouraged that the students themselves have adopted a keen interest in improving the campus atmosphere in such a way as to foster enthusiasm, with which all students pursue their strenuous intellectual efforts.

Babcock Discovers Star With Magnetic Field Of 34 Kilogauss

Discovery of the strongest magnetic field ever found in a normal star may be a little stronger than the earth's magnetic field reported recently by the Mt. Wilson and Palomar Observatories.

The find was made by Dr. Horace Wing, director of the observatory, and faculty guidance can be the same degree, so we are expected to have a very high percentage of the students who can be reduced or abandoned for such degrees. If the students were all as wise and as ambitious as they are industrious, there would be no problem; all requirements would be lifted and the student left completely free to outline and pursue the educational program best suited to him.

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Pauling Makes Bomb Record

BY RICHARD KARP

"Linus Pauling Speaks on Fall-out and Nuclear Warfare" is the title of a new Verve L.P. record, featuring Caltech's controversial scientist. This recording is longer than 45 minutes and is a defense by Pauling of his opinions concerning nuclear testing.

Pauling begins by describing a case where his knowledge of the subject was needed and the limitations of genetic mutation theory. Pauling believes that it is possible to prevent genetic damage from nuclear fallout by taking precautions such as not eating plants that may be contaminated.

This description of possible health effects which may result from genetic accidents is also accompanied by a statement on the first side of the record to x-rays, cosmic rays, and radioactive fallout. After establishing a connection between harmful genetic mutations and radioactive fallout, Pauling then discussed the extent and danger of the problem in California and elsewhere. He described a proposal for the development of a nationwide program to study the effects of nuclear fallout.

Dick Cotton knew he wanted to take the engineering route into management long before he joined New Jersey Bell Telephone Company. In fact it was his goal when he was working for his engineering degree at Rutgers. When he graduated, he had his lines out to eleven other companies. He came to New Jersey Bell because: "I didn't feel I was just a number in the organization. There was no doubt in my mind that this job would be the best for the long pull."

His first assignment was a tough one. A complex of major telephone cables lay in the path of the approach to the new traffic level of the George Washington Bridge on the Hudson. Dick's job was to find the most practical and economical way to route the cables, and at the same time to provide for future traffic increase in the area around the bridge approach.

Dick ironed that one out and got a crack at another tough job. Next year, New Jersey Bell Headquarters Engineering Staff, Special Studies Group. Here

Dick was a member of a four-man team whose job was to find ways to eliminate some of the routine work of field engineers to give them "more time to think." Dick also helped plan and control a $300,000,000 annual telephone construction budget.

Presently, Dick is responsible for telephone equipment engineering projects in the Camden, New Jersey area.

How does Dick look at it? "This is a growing business. I work with this growth every day. And growth means more room at the top. Of course, I don't figure I'll get there overnight--but on my jobs so far I've had a chance to take a good look at how this business is run. And I think the sky's the limit for a man who really wants to work for it."

If you're a guy who can tackle a tough job and deliver the goods--then you're the kind of man who should find out more about the Bell Companies. Visit your Placement Office for literature and additional information.

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CALIFORNIA TECH

Beaver Cagers Favored in Two Weekend Tests

Caltech's varsity basketballers start the wars atop tonight when they travel to L.A. Pacific College to engage the Crusaders. Although this is the first game for the Beavers after a four-week holiday, Pauling makes his plea to win the game handily. The Crusaders have never met the Caltech regulars, and it is doubtful that they have improved enough in a season to now handle the varsity. Game time is 8 p.m. at the L.A. Pacific gym, only a few minutes' drive from Caltech.

Saturday the Beavers journey to Riverside to play that city's branch of the University of California. This should be an exciting game, because the Beavers don't have a man over 6 ft. 3 in., but they are fast and have plenty of hustle -- more than the Beavers have shown to date.

Next Tuesday the Beavers visit the potent Redlands Bulldogs, led by Coach Whittier to take the SCIAC championship. Redlands has been heating some pretty big schools this season, having lost only twice in close games. The most impressive Redlands win was over Pepperdine, a member of the same conference as nationally prominent San Francisco and Loyola.

Before Christmas vacation Caltech opened the campaign against San Diego Naval Training Center, a team that had played five games before meeting the Beavers. The Techmen played a good game, but first-game jitters caused them to suffer two serious lapses; each of about two minutes duration, which cost them the ball game.

Asia Expert Dupree Starts AUFS Visits

Louis Dupree, American University Field Staff expert on Central Asia and Afghanistan, will visit Caltech next week. He will address the YWCA Diners' Club, speak to the History 5 class this Tuesday and the following Tuesday, and participate in numerous other seminars. Dupree's schedule:

Sunday, January 8: 7:30 p.m. -- INA Discussion Group, 1245 Arden Road.

Monday, January 9: Noon -- Lunch with Prof. R. W. Oliver, Athenaeum.

6:30 p.m. -- Underclass Diners' Club, Chandler Dining Hall.

Tuesday, January 10: 11:00 a.m. -- History 5, 203D; "Afghanistan"--Internal Patterns and Problems.

8:00 p.m. -- History 124, 205D, "Nationalism without Colonialism, Social and Political Institutions."

Wednesday, January 11: Noon -- "The Lucknow Forum, Athenaeum -- "A Brief Trip to Soviet Central Asia."

Thursday, January 12: 8:00 a.m. 11:00 a.m.--Eeon 206D, "American Private Investment, a case study."

Noon -- International Relations Section, Los Angeles Town Hall, Hotel Biltmore--Afghanistan--neutral, independent and developing" (illustrated).

CALIFORNIA TECH

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Tyler Develops New Concept Of Cancer

A new concept of cancer, including leukemia, as an allergic disease, was propounded this week by a Caltech embryologist. Dr. Allan D. Tyler has presented a description of his concept in the current issue of the Journal of the National Cancer Institute.

The theory is a coordination of a great amount of current information about cancer and about diseases resulting from antigen transplant, tissue from one animal to another under certain conditions. The symptoms and general pathology of cancer and such transplant illnesses are, in many ways, similar.

“We can express this theory in terms of a cancer cells being allergic to cells in the rest of the body, but the rest of the body not being allergic to the cancer,” Dr. Tyler explained.

Many investigators believe that cancer starts with a genetic change in one or more cells in a plant or animal. According to the Tyler theory, the change can occur spontaneously, or from damage caused by radiation, chemicals, or a virus or bacterium. Only one cell needs to be appropriately altered to start a tumor. Others have demonstrated that tumors can be transmitted in inoculations containing only one or two cancer cells.

To conform with the Tyler concept, the change must be the loss or inactivation of a particular gene, or group of genes, rather than mutation to a different kind of gene in the cell. Each cell has thousands of pairs of genes, and each gene carries a bit of genetic information that determines some characteristic of that cell and its progeny. The particular genes that would be lost or inactivated are those whose deficiency to cell's ability to get along with its fellow cells. They are called the histocompatibility genes. And there are probably a number of these in humans. In the cells of mice, for instance, experiments have disclosed 15 different loci (or locations) on the chromosomes where such histocompatibility genes occur.

The cell in which one of the histocompatibility genes has been knocked out is the same, genetically, as its neighbor cells except that one gene is missing. Since this cell contains no gene that is different from those of the neighboring cells, it does not synthesize any protein material that would be foreign to the neighboring normal cells. Thus the normal cells would still consider the cell with the gene-les to be one of them. They do not recognize it. They do not, then, become allergic to it.

However, the cell with the missing gene recognizes that it is different from the normal cells. That is because the latter contain one gene that it doesn’t have — namely, one of the histocompatibility genes. It can, then, become allergic to the other cells and react against them.

The explanation, that is offered by the theory for the excessive multiplication or proliferation of the cells in which gene loss or inactivation occurred is based on the proliferative response that antibody-forming cells are now known to exhibit when exposed to a foreign antigen. It is known that injection of a foreign antigen — such as polio vaccine, for instance — stimulates the antibody-forming cells to proliferate—and to produce antibodies. These antibodies can attach themselves to the virus or other foreign matter and neutralize it so that it cannot harm the body.

The stimulus to proliferation continues as long as the foreign antigen is administered and disappears after the antigen is eliminated from the body. However, in the case of the cell with the missing gene and its descendants, they are being exposed chronically to “foreign” antigen derived from the other cells of the body.

In addition to being stimulated to proliferate, the altered cells later proceed to make antibodies against the “foreign” antigen. Antibodies have the ability to destroy cells. Thus antibodies from the altered cells can damage quantities of normal cells. These antibodies may be liberated in the blood or other fluids of the body or may remain bound to the cells and be carried about by them. Such cells of the lymphoid series, bearing cell-bound antibodies, may also have the ability to destroy other cells.

“It seems likely that evidence for or against this theory can be obtained in a reasonably short time,” he added. “In this concept we have an alternative to the currently popular ideas that cancer cells owe their neoplastic (abnormal growth) property simply to their having been injected by a virus or to the older concepts that certain gene mutations intrinsically endowed the cell with neoplastic characteristics. The present concept supposes that the cancer cell is not innately different from the normal cell of its type. If it were transferred to a host that possessed no genes foreign to it, it would not behave as a cancer cell.”

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