



The Beam Line



Stanford Linear Accelerator Center

VOLUME 3, NO. 1

FEBRUARY 28, 1972

Physics Renaissance Due

(Ed. note: Reprinted from a S.F. Chronicle article "Making Physicists More 'Sensuous,'" by Marshall Schwartz, copyright Feb. 3, 1972).

A Massachusetts Institute of Technology physics professor yesterday called for the creation of the "sensuous physicist"—one concerned not only with formulas and theories, but with emotions and esthetics as well.

The extreme specialization of most scientific disciplines has not only turned off potential students, Dr. Brian Schwartz told the annual meeting of the American Physical Society here, but also isolated most people in the field.

"We've got a Tower of Babel here," he said, "with a stack of a thousand papers that most of the physicists can't even understand, unless it is in their own particular specialty."

"The size of technical journals is growing exponentially, but people are worried only about how to miniaturize them to get them on the shelf—not about how to cut down the output."

So while the field is growing, it is merely expanding into esoteric corners which only a few people really care about, Schwartz said.

Physicists are already used to dealing with things based on one type of duality—the relationship between particles and waves—so there is no reason why they couldn't instead deal with a different duality, equations and emotions, he declared.

The sun can be thought of not only in terms of the thermonuclear reactions going on inside it, but also "as a bright, shining, affirmation of life," the physicist, 33, said.

And the color red can be thought of in emotional terms—like anger and hatred and fire—just as easily as considering it a light wave of a certain wave length, he added.

Basically, physics—and all of science—should be more human, more fun, Schwartz said.

"I find these meetings alienating," he told his colleagues. "Physics as it is being practiced now is not a life-affirming profession. The reward structure is alienating."

One of the problems is that there are now too many people in the field—so people specialize in esoteric subjects in order to have something of their own to work on.

"We have to rethink the idea that more is good," Schwartz declared. "In fact, less physics of the kind we're doing may be more useful."

"When there were less physicists, these meetings were exciting, with a lot of ideas being exchanged. Now, with 10 or 20 per cent too many physicists, we spend all our time worrying about what to do with the extra 10 or 20 per cent."

Schwartz said he was "pessimistic" about the future of the profession. "I see a lot of the potentially good guys leaving physics."

"Applications at MIT, for example, are down 20 per cent. And only half of those admitted are accepting the school."

"In effect, the students are running the acceptance process by not coming,

Continued on Page 4



"Photon Crescendo," a painting by Walter Zawojski, dynamically brings drama and esthetics to physics and will be on display in the Public Information Office during the week of February 28.

The Word...an energy source

by K. Maddern

One of the most potent forces available to man is the word. Whether spoken, written, or simply thought of, words have the capacity to change ourselves and the world around us.

What is energy?

It is fair to say that the question has been and continues to be undergoing somewhat of an examination. The written word, however, does possess energy potential. As we read, the resulting thought patterns engendered by our interpretation of the words can create the desire for action or change of some kind, thereby allowing an energy exchange to take place. Just as with electrons, there are positively and negatively charged words. Perhaps the very existence of words negatively and positively charged is Nature's way of supplying balance to the human energy cycle. When an electron collides with a positron, a new energy

pattern is created. Similarly, the negative currents in human thought hopefully provide a guideline for decision as to the most constructive and positive steps toward man's own energy utilization.

What is a library but words?

However quiet those rows may be, the silence of the stacked books belies the tremendous resource of power available from their pages. A single book may perform the same function as a Klystron. That is, it can kick or stimulate the reader into further awareness or action just as the klystrons provide the power to accelerate an electron beam.

A library is a place of renewal. The distilled thoughts of other humans, transposed into written form, represent the very essence of the forces within man. Thus, we can directly benefit (or suffer) from the experiences of people we may never meet and can recharge (or short-circuit) our own mental batteries

depending on the company we keep through books. Hopefully, we try to avoid the GIGO method of recycling information (Garbage-In, Garbage-Out).

SLAC Library

At SLAC, our library is a center of purposeful, good-humored activity. It's a pleasure to walk into that well-lighted spot where the librarians are always ready to assist in finding the material of your choice. If it can't be found readily, you will probably soon receive either a slip of paper in the mail or sometimes even a personal delivery of a book which was specially ordered because of your request. Our library offers the finest assistance in finding books and information with their own special dash of high-frequency-good-will-emission that makes their department what it is.

If you are searching for energy, one place to look is within the life-giving power of the word.

SLAC Labor Pool

There are only twelve people in SLAC's Labor Pool, but an incredibly wide variety of duties carries them all over the site — as well as off — so that members of the group seem to be almost everywhere at once.

Under the supervision of Manuel Gutierrez and working leadman Reyes Valenzuela, the group is responsible for ground maintenance (trees, streets, tractor work, digging), hauling and transportation (film hauling, moving material around the site, furniture moving), supplementing groups with short manpower (stores, shipping and receiving, warehouse), and many other miscellaneous jobs are within the group's province — as one member put it, all the "odd jobs" around SLAC.

Other members of the group are Percy Clay, Marvin Hooker, Juan Miranda,



There is a big hole to fill when Percy Sullivan cannot work. He helps keep the site, particularly the Research Yard, in a neatness.

Ronald Pacheco, Raymond Robello, Alan Schmierer, Percy Sullivan, Ellsworth Wilson, Santiago Limon, and Marcelino Pacheco.

Occasionally, the Labor Pool is faced with unusual tasks requiring considerable inventiveness. Last June, for example, a crew was called on to do the initial layout for the SLAC employee garden. For the past two years, the Labor Pool and the Rigging Crew have hauled the PIO exhibit equipment to and from the Santa Clara County Fair in San Jose. In August of 1970 they again moved a major exhibit from the Palace of Arts and Sciences in San Francisco back to SLAC.

More recently, Pacheco, Wilson, Schmierer, Hooker, and Limon spent almost 70 man-hours helping cleanup operations after our December 7, 1971 bombing incident.

Often their duties take them to quite lively outdoor activities. They frequently are called to round up stray cattle to prevent them from damaging

newly-planted trees in the pastures around SLAC — on one occasion cattle were moved to the fields around the kystron gallery to serve as living



Ronald Pacheco (right) and Ellsworth Wilson help here with road upkeep.

lawnmowers there (labor pool help was certainly needed on the gallery roadway after the cattle were moved out).

They have been called on to drive away skunks, catch unfriendly cats living under buildings, and distribute as many as



Percy Clay keeps spirits light while he works.

sixty snakes at one time to serve as SLAC gopher control.

In working with members of the Labor Pool, their general cohesiveness and joviality are readily apparent — a result, perhaps, of the wide variety of situations in which the group finds itself with short notice.

SERA'S Annual Meeting Held

On January 20th SERA had its last annual membership meeting for election of Directors. From now on, SERA membership meetings will be semi-annual with the next scheduled for July. Only one Director will be elected at a time so that two "old hands" will always be aboard.

The SERA membership, particularly her fellow Directors, wish to thank Dorothy Ellison, the retiring President, for her leadership this past year. Under her administration, SERA's membership has stabilized, reserves have almost reached the projected level, SERA's status as a charitable organization has been confirmed by the head office of the IRS, and more individuals at SLAC have been helped over rough spots.

Larry Esquibel, who gave a resume of

the grants-in-aid made by SERA during the past year, was re-elected Director for a six-month term. Viola Belton, Crafts Shop, was elected Director for the regular 18-month term.

In calendar 1971, SERA made nine grants, averaging \$306 each.

For membership forms to join SERA, see one of the officers:

Charles Hoard, President
Larry Esquibel, Vice-President
Viola Belton, Secretary
Krys Ciolkosz, Treasurer

For applications and information on SERA grants, see an officer or one of the following:

Dorothy Ellison
John Alcorn
Bernie Lighthouse

All of the above are former SERA Directors.

Annual Users Conference

by Bill Kirk

The seventh Annual Users Conference was held at SLAC on February 4 and 5, 1972. This Conference is held each year to acquaint physicists from other institutions with recent developments in SLAC's facilities, and with the Laboratory's plans for increasing its research potential. This year's attendance was the largest we have had: 135 individuals from institutions outside Stanford came to the Conference. The large turnout was due to the prior meeting of the American Physical Society and American Association of Physics Teachers, held in San Francisco.

Among the topics covered at the Conference were the new secondary beams that have been recently set up beyond end station B, recent developments in bubble chambers (selective triggering and more rapid cycling of the chambers), and a description of the SPEAR storage ring facility which is expected to begin operating within the next several months.

Two large wire spark chamber facilities were also described. The first of these is the facility that has been used by Experimental Group G in studies of the K^0 meson. The second is the Large Aperture Solenoid Spectrometer (LASS) which is presently being constructed by Experimental Group B. The LASS facility appears to have exceptional potential for future experiments at SLAC, and for this reason the second day of the Conference

was devoted exclusively to a work shop on this new facility. A full article on LASS will appear in the next issue of the Beam Line.

Another topic of much interest to the conferees was the development program now going on at SLAC for recirculating the electron beam. This project is called the Recirculating Linear Accelerator (RLA). There appears to be a good chance that the AEC will approve the RLA project within the next year or two. If built, RLA will make it possible for SLAC to produce electron beams of at least twice the present energy or, alternately, beams of greatly increased duty cycle ("duty cycle" is the fraction of the total time that the electron beam is actually on). Improved duty cycle would greatly benefit counter experiments by reducing the background of accidental coincidence.

Several points regarding SLAC's user community may be of interest. During the 5+ years of SLAC's operation, outside users groups have accounted for about 50% of all of the electronics experiments done at SLAC, and about 85% of the bubble chamber experiments. More than 100 graduate students from outside institutions are involved in Ph.D. studies that are derived from experiments at SLAC. The total number of physicists from outside institutions who have participated in SLAC's work is more than 200, from about 40 different institutions.

Heart Disease at SLAC

by Loenard A. Sagan, M.D.
and Joan Gardner, R.N.

We usually first become aware of a death from heart disease among our employees when we notice an epidemic of people coming in to ask about bizarre chest complaints. This year there seems some reason for concern. There have been four deaths due to myocardial infarction among well-known SLAC people. Are our staff at greater risk than other men?

Using the current age distribution of our male employee population, we assumed that this population had been at risk for 5 years, and from this calculated person-years at risk per age year and then made comparisons with age-specific rates for all U.S. males. Numbers are as follows:

AGE	EXPECTED	OBSERVED
44	1.4	1
45-54	4.6	4
55-64	4.8	4
65-74	4.9	1
	15.7	10

Note that we would have expected on the basis of U.S. experience more than 15 deaths from myocardial infarction, whereas only 10 occurred. In other words, we have had about 2/3 of deaths that might have been expected, and this advantage has been shared by all age groups, particularly the eldest.

What has been unusual is the clustering of deaths in 1971 when 4 of the 10 deaths occurred, whereas no more than 2 occurred in any previous year. We have no explanation for this and of course this may be only statistical variation without significance. No such phenomenon has been noticed at Livermore Laboratory this year.

A number of factors are known to be associated with coronary artery disease. They are: obesity, cigarette smoking, inactivity, hypercholesterolemia, diabetes and hypertension. Of these variables, only height and weight were available for all 10 persons dead of heart disease. Comparing these with ideal weights (by height group) we find the following ideal weight or less

0-20 lbs. overweight	3
20-30 lbs. overweight	2
30-40 lbs. overweight	0
40-50 lbs. overweight	3

We do not know whether this distribution differs from that for SLAC employees as a whole.

What does need to be explained is why we at SLAC seem to do better than the rest of the population is doing if that is indeed a significant finding. We have no explanation for that. Maybe we smoke less. We have no data on that. It does appear that the professional group were the greatest beneficiaries of this deficit in deaths from heart disease since they had only one quarter the deaths expected.

	EXPECTED	OBSERVED
Manual	1.2	1
Skilled	10.3	8
Professional	4.4	1
		10

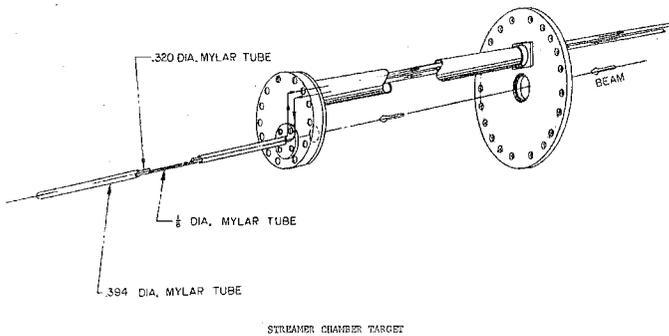
In examining differences in risk factors among professional vs non-professionals, no strong differences were found in the small numbers examined. There were 75 percent non-cigarette smokers in the professional group compared with 55 percent non-smokers in the non-professional group.

In summary, SLAC employees appear to have fewer deaths from coronary artery disease than would be expected. Reasons for this are not clear from the small samples examined.

New Manager At AEC-SAN

Robert D. Thorne has been appointed Manager of the Atomic Energy Commission's San Francisco Operations Office in Berkeley, California, General Manager Robert E. Hollingsworth announced today. He will succeed Ellison C. Shute. Mr. Thorne's appointment will be effective at the time of Mr. Shute's retirement on April 14. He has been Deputy Manager of the San Francisco Office since October 5, 1970.

Unique Hydrogen Targets Developed Here



STREAMER CHAMBER TARGET

by CHARLES OXLEY

Several unusual liquid hydrogen targets have been developed for use at SLAC by the liquid hydrogen target group. Boiling hydrogen is the basic refrigerant for most of the targets. As SLAC beams progressively become more intense and energetic and experiments more precise and sophisticated, targets have gone from a simple thin-wall, insulated type to more exacting designs. One of these designs was occasioned by the large heating effect of the powerful, finely focussed SLAC beam. It was found that simple targets gave as much as fifteen percent less yield when struck by the full 360 pulses per second as they did when struck by an occasional pulse. This was a direct effect of density reduction by beam heating in the liquid hydrogen. This problem was overcome by forced rapid circulation of the hydrogen. Another problem was the provision of an internal liquid hydrogen target for the streamer chamber. In the streamer chamber there are extremely high electric fields and a very slim long target is desired so that nearly complete streamers show with little dead space invisible inside the target. Beam heating is not a problem since only secondary beams are used, but the heat flow from the surrounding room temperature equipment can be as much of a problem as the beam heating.

In scattering experiments the scattered beam is proportional to the incident beam, the distance traversed in the target, the density of the target and specific nuclear characteristics, usually expressed in terms of cross-sections. In probing nuclear matter with SLAC beams it is highly desirable to study the nucleon components of nuclear matter separately, as far as is possible. Pure hydrogen is an ideal target except for the extraneous electron around the proton. The only practical way to study the neutron (the other nuclear component) is to study it in a hydrogen isotope, deuterium, in which a neutron is loosely bound to a proton. Sometimes subtraction or other special techniques are used to study hydrogen and deuterium chemically combined as in polythene or paraffin. Generally it is much more desirable to have a liquid hydrogen target with as little wall material surrounding it as is feasible.

Liquid hydrogen boils at 20.4 degrees Kelvin (-423 degrees Fahrenheit). It is light, being one-fourteenth as dense as water. Hydrogen is highly flammable, being flammable in a four to seventy-five per cent concentration in air. Since liquid hydrogen is relatively inexpensive the boiling hydrogen is used as a primary refrigerant around SLAC, somewhat in analogy to the ice-block in grandmother's refrigerator. Liquid hydrogen from commercial sources is brought in on tank trucks and stored in a 15000 gallon storage tank at the north end of the experimental yard. From there it is transported in 265 gallon trailers to various experimental sites. Sir₂, in scattering experiments, a constant path in

the liquid hydrogen is desired, bubbles must be avoided. By providing very good insulation, bubble formation may be made negligible. The best form of insulation is thermos bottle style with a double walled vessel with evacuated space between the walls to reduce convection and conduction and also coated with reflecting coating to control radiant heat. As a further control of bubble formation, and as an essential part of the use of deuterium, which is expensive and scarce, a two temperature system is used in which a large tank of hydrogen is kept boiling at atmospheric pressure and a closed system pressurized with hydrogen in thermal contact with the primary system. Whereas hydrogen boiling at atmospheric pressure is at 20.4 degrees above absolute zero, hydrogen at 2.3 atmospheres boils at 23.5 degrees. A diagram of the streamer target system is shown.

In the group A targets, it was found that in extreme circumstances the hydrogen in the target was locally superheated by the beam by some ten degrees, reducing the density by a corresponding fifteen percent. In precise experiments, this is a very undesirable and troublesome effect. After a preliminary test of enhanced convection by a chimney effect, the target group resorted to forced circulation by means of a small fan inserted in the target exit line. It was found that a small, suitably modified, three phase electric motor could be run submerged in the liquid hydrogen. The motor was built to eliminate insulation which would crack on cooling, and laminations in armatures which would cause thermal trouble were eliminated by use of solid iron. Ball bearings with stainless steel braces and special fluorocarbon spacers will operate without lubricant in liquid hydrogen.

The beam deposits as much as ten watts of power per inch in liquid hydrogen. In a typical three-inch diameter target the loss is thirty watts. It was found that the motor consumed only fifteen watts, an amount the boiling hydrogen refrigerant could easily handle. The purpose of the forced circulation is to replace the hydrogen struck by the beam pulse with a fresh, unheated portion of the liquid in the time available between pulses (one 360th of a second).

Even with the control of hydrogen bubbles and density fluctuation the targets are not ideal, nor is the beam. Background scattering from the target wall may be evaluated with empty targets. Beam characteristics, particularly beam halo, may be measured with various solid targets with a variety of holes and slots in them. The combination of all these targets within a single vacuum can, so that they can be rotated in and out of the beam, was first prepared for Dick Taylor and Group A.

The liquid hydrogen target for the streamer chamber presents special problems. One problem is the prevention of sparking in the extremely high electric fields. Metals and metallic coating must

be avoided entirely, and even insulating materials must not have sharp corners which lead to locally intense electric fields. It is desirable to have a long, thin target. The long length is desired to maximize the "interaction length" as the weak secondary particle beam traverses it. The slimmest is desirable to leave as much of the secondary particle track exposed to the active streamer region of the chamber as possible.

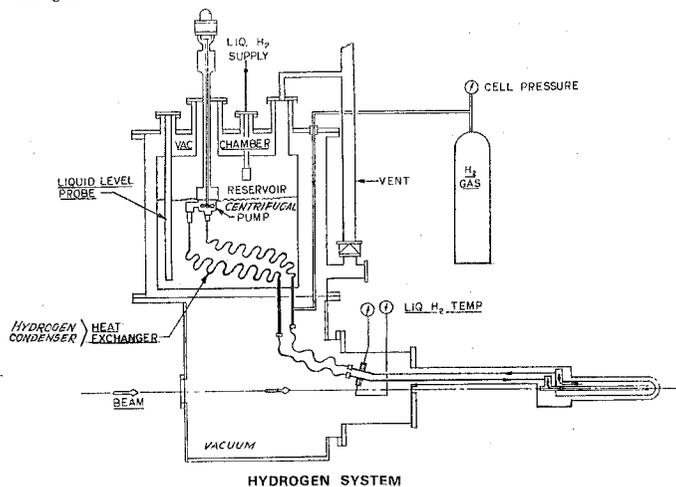
The target developed here at SLAC, the essential parts of which are shown in the diagram, is the first successful one of its type. It is made up in tri-axial form with a mylar plastic soda-straw transporting high pressure liquid hydrogen from the reservoir at the back of the target to the front cap (see diagram), which is in turn connected to the outside fat soda-straw which returns the hydrogen to the rear of the target. A further jacket of thin mylar tube provides an evacuated space for thermal insulation.

This type of target has recently undergone successful tests in the streamer chamber. It has withstood the high voltages successfully and also has good enough thermal insulation so that bubbles

are not formed within the target. Previously, a high pressure hydrogen gas target had been used for a photoproduction experiment. The first liquid target to be placed in the streamer chamber will be used for the E-60 experiment to be performed by a SLAC-UC Berkeley collaboration. A second, slimmer target is planned for the deep inelastic muon scattering experiment, reported in the last Beam Line, by the UC Santa Cruz-SLAC collaboration.

Rather than the fan-motor combination used in the group A experiments, a modified centrifugal water pump has been used to provide a higher pressure for the tri-axial streamer chamber target.

Associated with John Mark, who heads the hydrogen target group, are Domingo Cheng and Bill Pierce, engineers, and Aage Bysheim, Randy Champion, Bernie Denton, Merle Flowers, Boris Golceff, Dennis Healy, Al Koula, Jack Nicol, Ed Pathway, Dan Roman, Anthony Tilghman, Thorwald Van Hooydonk, and Tom Walsh. The group is a part of EFD, under Ed Seppi.



HYDROGEN SYSTEM

Opportunity for SLAC Inventors

SLAC inventors are eligible to participate in Stanford's unique entrepreneurial patent licensing program which, although only two years in existence, has brought in over \$160,000 in royalty payments. The program

provides that one-third of net royalties are allocated to the inventor. For SLAC inventions, disposition of the other two-thirds are to the "Organized Research Fund of Director" and the "University General Fund." The program is optional to the inventor and also the program from the point of view of accepting the invention for development.

At SLAC, the right to determine disposition of inventions rests with the AEC. Where an invention is not concerned with atomic energy, however, the University can petition the AEC to return title to the University in order that the University can seek development of the discovery for public use and benefit. While the AEC has not been tested in this regard, the University has successfully petitioned for title to inventions derived from HEW, Army, Navy, Air Force, NSF and NASA research support. Even though the AEC patent head, Mr. Roland Anderson, advised Mr. Niels Reimers, Stanford's Manager of Technology Licensing, that "it would be an unusual situation where the AEC would grant licensing rights," Mr. Reimers has expressed willingness to seek title from the AEC to SLAC inventions that may have commercial usefulness.

Further details about the program can be found in University Guide Memo 75. If there is sufficient interest, Doug Dupen (ext. 2204) will arrange for Mr. Reimers to come to SLAC to tell more about the program.

Theorist Bjorken Wins Prize

Prof. James D. Bjorken of the Stanford Linear Accelerator Center was awarded the 1972 Heineman Prize during the joint annual meeting of the American Physical Society and the American Association of Physics Teachers Jan. 31 to Feb. 3 in San Francisco.

Cited for "his contributions to particle theory, in particular his elucidation of the connection between the short-distance behavior of currents and such physical phenomena as inelastic lepton scattering," Professor Bjorken received the prize at a banquet meeting Wednesday evening, Feb. 2. It is awarded annually by the two professional organizations for distinguished work in mathematical physics.

Bjorken has been a key figure among theorists seeking to explain observations of "deep inelastic scattering" in the SLAC-MIT experiments bombarding protons and neutrons with high-energy electrons from the two-mile accelerator.

MCFH Benefit

The award winning film, *Nothing But a Man*, will be given a special one night showing for peninsula audiences on Wed. March 1, at 8 p.m. in the Gunn High School Spangenburg Auditorium, 780 Arastradero Road, Palo Alto.

Arranged in cooperation with the National Urban League, this special showing of *Nothing But a Man* will benefit the Midpeninsula Citizens for Fair Housing (MCFH) and the California Housing Coalition (CHC). MCFH, serving Redwood City through Sunnyvale, is a 1000 member group which seeks to secure for all individuals an equal opportunity to purchase or rent property where they choose.

Nothing But a Man is a "prime example of a work of art brilliantly serving a social purpose while meeting all the requirements of diverting entertainment," according to the *Christian Science Monitor*. The *London Observer* said: "The best film I have ever seen about the wary, frustrated life that American Negroes lead in the South; instead of heroics and lynchings, we have understatement and silky verbal menaces."

This extraordinary film won two prizes at the Venice Film Festival as well as an award from the National Council of Churches.

Admission is \$2.50 for adults and \$1.00 for children.



SINCE FIRST I SAW YOUR FACE...

Since first I saw your face,
I loved you for comely grace,
Cupid must have been in range,
I know, my course did change.

Since then, I've grace entreated
With fervent prayers oft repeated,
With sighs revealing anguish
Wherein I daily languish.

Thoughts of you began to hark,
In the light and in the dark,
Till that silence, over, under,
Makes my heart strike like thunder.

I don't know, but it seems
I resemble floods and streams,
The shallow grumbles, the deep is dumb,
So my affections whence they come.

When away, to you I scheme to fly,
Increasing torments each time I try,
So plans are changed, I do retire
To my room, there to expire.

But then fresh pains I do create
By mounting hopes for any fate;
And though with myself I do wrangle
My heart is fast, cannot disentangle.

And, weary under the weight of woe
I resolve (not really) to overthrow,
So I use sleep to shorten the day,
Dawning another while in stillness I lay.

Merging myself in vision of delight,
I find myself with no other choice,
Either verses to sing or write
Or else to capture the sound of your voice.

Charles Xuereb.

Renaissance

Continued from Page 1

not entering the field. And those who are coming are very obeying — the ones who would question what they are taught are not going into science any more."

If not for the expansion of the medical and related fields, "it would be a disaster for science now," Schwartz added.

But even this is just delaying the inevitable, he declared. Most of the work going onto the area winds up in industrial technology, he said.



Bob Laurie of Mechanical Engineering (left) and Charles Cochrane of Crafts Shop contributed to a very successful SLAC Christmas program with their rousing bagpipe music. Mr. Laurie has become a tradition at the Christmas season here, having played for SLAC each year for ten years in a row, beginning on campus in the M-1 building. Mr. Cochrane often plays upon request for Crafts Shop Christmas parties and other activities. Both are members of the City of San Francisco Pipe Band.



Physics by Feynman

SLAC's Public Information Office, in response to numerous requests (at least one that we can remember) will present, beginning Thursday, March 2, a series of seven movies in which Caltech's Nobel Prize-winning physicist, Richard P. Feynman, discusses a variety of topics in physics.

The films were made while Professor Feynman delivered a series of lectures to undergraduate University audiences. They're not aimed at physicists or even science majors, but rather at people with some knowledge of and interest in science and a healthy sense of humor.

Each movie will be shown twice, once at noon and once at five p.m. in the SLAC Auditorium on seven consecutive Thursdays starting this Thursday. Each movie lasts about one hour.

The program is:

- March 2 The Law of Gravitation — An Example of Physical Law.
- March 9 The Relationship of Mathematics to Physics.

- March 16 The Great Conservation Principles.
- March 23 Symmetry in Physical Law.
- March 30 The Distinction of Past and Future.
- April 6 Probability and Uncertainty — the Quantum Mechanical View of Nature.
- April 13 Seeking New Laws.

Special Events

In case you missed the January announcement, SLAC is now having special programs on an irregular basis instead of giving the weekly films as previously. If you have an idea for a program of education or entertainment that you think would be of interest to SLAC employees, please drop by or call the Public Information Office with your suggestion and talk with Kathleen Maddern (room 233, A&E Building, or ext. 2204).

A Time to Sow

Last June, SLAC initiated a gardening program for interested employees in which some fifty 10x20 garden plots were assigned on the hill east of the computer complex. The success of the program is evidenced by the photo — the area has proved quite fertile.

The plots have now been declared open again, so if you had a plot last year

you can "renew" it for the coming growing season by calling Ted Johnson x2433 or Gloria Strelchuk x2745 by March 6. Any plots not renewed by then will be vacated and assigned on a first-come, first-served basis.

So, if you didn't have a plot last season and would like one, call Ted or Gloria.



SLAC's vegetable garden, as it appeared a few months ago. Shown are Louise Shreve and Glenna Owens, both in Data Analysis.

Lower New Car Rates

Thinking about buying a new car? The Stanford Federal Credit Union announces new, lower interest rates for new car loans. If you can put at least 20% down on the car, the interest rate is only 8.4% (true annual percentage rate). According to Dale Hanan, Credit Union Manager, this is the lowest interest rate in the area where only 20% down is required. If you can't come up with the 20%, you may still qualify for a new car loan, at the old 9.6% rate.

The Credit Union loans include free creditor life insurance (other lenders typically charge you extra for this).

The Stanford Federal Credit Union is located at 770 Pampas Lane on campus, is open from 8-5 (including the noon hour), and their telephone number is 8-4887.



"Sometimes I think you're a serious research-and-development man, Roberts, and sometimes I think you're just messing around."

Sportsfans

For those who like to jog, play football, baseball, frisbee, or whatever, but want to shower before going back to work, eleven showers are available on the site. Two showers are in the Fabrication Building, three in Heavy Assembly, one in GSB, three in Crafts Shop, one in Building 101 (SPEAR), and one in Building 102.

Bring your own towels and soap. Also, no lockers are currently available, so clothing and valuables should not be left in the shower areas.

THE BEAM LINE

Editor Kathleen Maddern
Associate Editors D. Dupen, S. Kociol
Graphic Artist Walter Zawojski
Regular Contributor Charles Oxley

Published by the
SLAC Public Information Office
P.O. Box 4349, Stanford, California 94305
Tel. (415) 854-3300 Ext. 2204