



SLAC NEWS

VOL 1 NO. 5

STANFORD LINEAR ACCELERATOR CENTER

JULY 31, 1970

SLAC To Exhibit At Santa Clara County Fair

SLAC's Public Information Office, Willie Johnson of Electronics and two high school honor graduates are collaborating to put together an exhibit for the Industrial Participation Program at this year's Santa Clara County Fair. The Fair, to be held August 14 through August 23 at the Fairgrounds (Tully Road in San Jose) is marking its twenty-sixth anniversary this season.

The Industrial Participation Program at the Fair consists of eight, fifteen-minute live presentations by honor students from Santa Clara County high schools. Each presentation is sponsored by a participating organization (Sylvania, Pacific Telephone, Lockheed, UTC, NASA, IBM, Standard Oil, and SLAC) which selects two students, trains them, and provides each with a seventy-five dollar honorarium. Two or three shows, each lasting roughly two hours (eight times 15 minutes) will be given each day.

SLAC's students, both June high school graduates, are Priscilla Stephenson of Sunnyvale and Ted Willhite of Campbell. Priscilla is a graduate of Fremont High School and will be studying biology at the University of California's San Diego campus. Ted graduated from Del Mar High School in Campbell and plans to study Materials Science at UC-Berkeley.

The students were recommended by teachers and school officials, and were screened and selected on the basis of personality, scholastic achievement and scientific interest.

SLAC's demonstration will have two parts. First, one of the students will discuss how the accelerator works. Visual assistance will be provided by a ten-foot accelerator section which electronically imitates the movements of electrons riding the crests of a powerful radio wave. Willie Johnson is constructing this by rebuilding the five-year old "talking accelerator section" commissioned by Arnold Eldredge, then in charge of SLAC's

Continued on Page 6



Some SLAC'ers and guests look over new barbecue facility near Cafeteria patio.

New Barbecue Area Is A Big Hit

Using Employee Recreation Funds, the Craft Shops constructed a new barbecue area which became available for use in early June. The area, which is located near the Cafeteria patio, presently includes two drum-type barbecues with a serving table between them, and a large, heavily constructed picnic table. It is hoped that a second table can be added out of the new fiscal year's funds.

Vern Smith of the Electronics Shop was the first to use the new facility, bringing a large group of Cub Scouts and their families out for a Sunday cookout. The second big group to use the area was the Stanford Electronics Laboratory group who held their annual picnic here in late June. Over 150 people attended that event and SLAC received glowing praise from the picnic chairman for the way the facility accommodated their group and for the fun the group had that

day. SLAC's Masonic Club is the next group that reserved the facility for their annual picnic July 29th. They were expecting approximately 200 people, and are also using Auditorium facilities to show movies on SLAC and to play records from the Control Room, in addition to other entertainment plans.

Normally, during the week, other than the lunch-time groups at the big table, the facility is lightly used, and SLAC family groups should have little problem in planning a barbecue there. On weekends, however, the demand has become steadily greater for the area, and it is best that anyone wanting to use it call Public Information on 2204 to reserve the facility. The only other requirement for use of the area is that groups police-up after themselves as SLAC's ground maintenance people are not basically responsible for that type of cleanup.

SIXTH USERS' CONFERENCE HELD

With national attention being focused on drug problems and abuse, it appears anticlimactic to say that the strongest stimulant ingested at the recent SLAC User's Conference was (probably!) the caffeine found in the coffee.

Physicists deeply involved in the excitement of exploring the subnuclear frontier manage to keep high without help, and some 183 of them met June 17-18 at SLAC. Ninety-two represented "real" outside users while the others were from SLAC, Stanford or the AEC. Roughly one-fourth of the users came from Berkeley's Lawrence Radiation Laboratory.

SLAC is a national facility, and as such encourages research groups from other institutions to submit proposals for experiments here.

The conference had a number of purposes. For new users, it served to acquaint them with SLAC's facilities. For new and old users alike, it presented a view of tentative plans for some equipment rearrangements and new facilities to be built. Users were asked for comments and discussion concerning the new plans.

Wednesday, June 17, was devoted to general talks on research facilities and the general situation at SLAC.

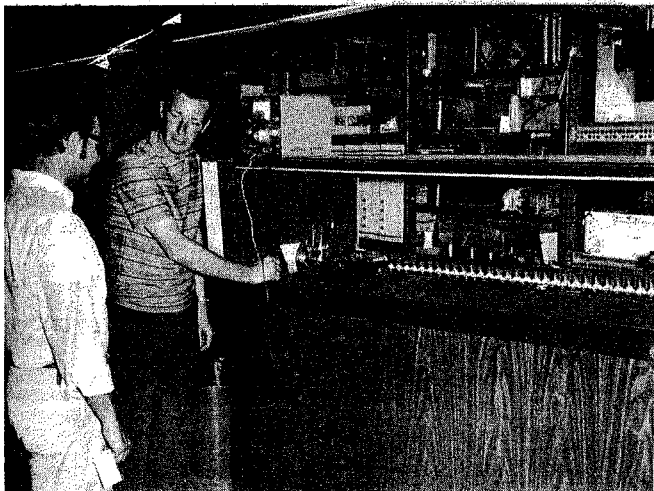
After a brief welcome by Dr. Ballam, SLAC Associate Director in charge of the Research Division, Dr. Neal, Head of the Technical Division, discussed recent operation of the accelerator itself. He noted that in its four years of operation, the machine has constantly attained new heights of reliability and flexibility. At present, roughly 85% of the time that the machine is on it is used for physics experimentation. When the machine is on, typically three experiments at a time are running. High-power klystron tube life continues to improve — median tube lifetime is now 13,000 hours. Beam intensity (the number of electrons per second which can be accelerated), once severely limited by the "beam breakup" phenomenon to a value half that of initial design specifications, continues to increase through focusing techniques and "dimpling" of the accelerator structure. The present peak intensity of 70 milliamps (0.5 billion billion electrons per second) is about 75% higher than the initial design.

Improvements to the machine, note Neal, include the replacement of conventional 20-million watt klystrons by 30-million watt tubes. Total conversion would boost SLAC's peak electron energy by roughly 25%.

Professor R.P. Feynman of Cal Tech gave a talk on partons — the name given to the particles which, in one theory, inhabit the proton as its internal structure. Attendance at this talk was about 150. Feynman is known for being a highly entertaining speaker and his qualifications for discussing this topic are impressive — he invented the WORD "parton" and has shared the Nobel Prize as one of the inventors of quantum electrodynamics.

The next speaker was Joe Murray of SLAC's Experimental Facilities Department (formerly known as RAD). He discussed SLAC's capabilities with regard to secondary beams. Over the next

Continued on Page 8



Willie Johnson, Electronics, discusses progress on the accelerator model to be used at the Fair with Steve Kociol, Public Information Office.

Editor's Note

Because of vacations within the Public Information Office, the SLAC NEWS will not be printed in August. We will, however, resume publication in September. One of our big problems between now and then is the replacement of regular contributor Ruth Pava, who recently left SLAC for an appointment at the Stanford Medical Center. (See story elsewhere in this issue of the NEWS.) If anyone would like to try their hand at writing a few articles for the paper on a somewhat regular basis, please contact Jack Sanders or Steve Kociol on extension 2204. We need all the help we can get if we're to continue trying to provide as diversified coverage of the project as possible.

Although we have expanded this issue of the paper to eight pages, we will return to our four-page format with the September issue.

LRL Retires 25-Inch Bubble Chamber

Lawrence Radiation Laboratory at Berkeley announced the retirement of their 25-inch bubble chamber in the June issue of *THE MAGNET*. Significant to SLAC in this development is the fact that many parts from the chamber have been sent down here for our use. These include the refrigeration and control systems, the camera and part of its film developing equipment and some vacuum components. These components are intended for use with SLAC's 15-inch, rapid-cycling bubble chamber which is currently under development here and which will be reported on in a later issue of the *NEWS*.

This is the second time LRL had contributed to SLAC's bubble chamber development program for our 82-inch chamber is a modified version of LRL's old 72-inch unit. Though it was considered that the 25-inch chamber was still useful at Berkeley, it was felt it had been somewhat outtrunked by the 82-inch and LRL decided to retire the chamber and put available money and resources into other facilities and programs at the Laboratory.

During its six years of operation at LRL, the 25-inch chamber took 9.3 million pictures of high-energy nuclear interactions, using approximately 1,000 miles of film. The chamber also had several design features that made it a "uniquely useful and versatile machine," according to LRL. Its unique bellows design, for example, reduced turbulence and permitted uniform temperature throughout the liquid hydrogen in the chamber. This contributed to the chamber's being one of the "cleanest" ever built with its pictures so clear that automatic scanning and measuring were made much easier.

Bob Watt, SLAC's Bubble Chamber Operations Chief, headed operation of the 25-inch chamber at LRL for its first few years, and also made important contributions to the design of the chamber. Frank Barrera, also with SLAC now, was a member of the mechanical design team for the chamber. Like all bubble chambers, however, the 25-inch chamber derived from an original idea of Nobel Prize winning physicist, Don Glaser. Dr. Luis Alvarez of LRL and the late Don Gow were responsible for the general direction of the design and construction of the chamber.

SLAC First Customer For New Microfilm System

The next time you visit your favorite physicist or programmer, be sure to marvel at the incredible quantity of printed computer output cluttering up his office. It's usually impossible to find any place to sit, much less write. Clutter is a real problem for anyone using a computer to any significant degree.

Another problem associated with mountainous quantities of data is that of merely getting it printed. Ordinary line printers are capable of printing about 1100 lines per minute, which sounds like a lot until you find out some printouts required by the Computation Group take 20 to 30 minutes to complete.

One way to solve both problems simultaneously is to use microfilm instead of paper. A microfilm reel or cassette is notoriously easier to store than a two or three inch stack of paper. It turns out, in addition, that printing data onto microfilm can be accomplished up to ten times faster than using the conventional line printer.

Memorex Corporation has succeeded in developing an entire on-line microfilm printing system that operates as a standard peripheral with IBM System/360 Computers. SLAC is currently testing their prototype units on-line with our 360/91 computer. Selective testing has been going on since the unit was installed in late February and a month or so of user-oriented testing began on June 1. SLAC is the first customer location for this system.

The essentials of the Memorex system at SLAC are a microfilm printer which prints out a 132-character line directly on microfilm at rates up to 10,000 lines per minute; a table-model developer which is capable of developing film at the rate of six feet per minute, each foot containing over 1800 lines; a previewer for both editing and cassette loading; and a viewer/printer which allows both film viewing and, if desired, 8½ x 11-inch printout of what is being viewed.

The way in which space is saved can be seen by noting that one inch of microfilm contains 158 lines of printed output.

It is hoped, notes Tom Richmond of the Stanford University Computation Group at SLAC, that this new system will increase the 360/91's "thruput" significantly. (Thruput is a term for the amount of work able to be accomplished by a computer). The purpose of the June test is to determine how much thruput will be increased with the aid of this very fast system.

SLAC Dictionary

Part V

EXCITED STATE The state of an atom or nucleus when it possesses more than its normal energy. The excess energy is usually released eventually as a gamma ray or photon.

FILM BADGE A package of photographic film worn like a badge by workers in the nuclear industry to measure exposure to ionizing radiation. The absorbed dose can be calculated by the degree of film darkening caused by the irradiation.

FISSION The splitting of a heavy nucleus into two roughly equal parts (which are nuclei of lighter elements), accompanied by the release of a relatively large amount of energy and frequently one or more neutrons. Fission can occur spontaneously, but usually it is caused by the absorption of gamma rays, neutrons, or other particles. No research in this area is carried out at SLAC.

FUSION The formation of heavier nucleus from two lighter ones with the attendant release of energy as in a hydrogen bomb. No research in this area is carried out at SLAC.

GAMMA RAYS High energy, short-wavelength electromagnetic radiation. Gamma radiation usually accompanies alpha and beta emissions and always accompanies fission. Gamma rays are very penetrating and are best attenuated by dense materials like lead and depleted uranium.

GEIGER COUNTER A radiation detection and measuring instrument. It contains a gas-filled tube which discharges electrically when ionizing radiation passes through it. Discharges are counted to measure the radiation's intensity.

HEALTH PHYSICS That science and art devoted to recognition, evaluation and control of all health hazards from radiation.

HEAT EXCHANGER Any device that transfers heat from one fluid to another or to the environment.

HEAVY WATER Deuterium oxide, D₂O. Water in which ordinary hydrogen atoms have been replaced with deuterium atoms. Natural water contains one heavy water molecule for every 6500 ordinary water molecules.

HYPERON A class of short-lived, sub-nuclear particles with masses greater than that of the neutron.

INDUCED RADIOACTIVITY Radioactivity that is created by bombarding a substance with neutrons in a reactor or with charged particles produced by particle accelerators.

ION An atom or molecule that has lost or gained one or more electrons. By such "ionization" it becomes electrically charged. Example: alpha particle.

IONIZATION The process of adding electrons to, or knocking electrons from, atoms or molecules, thereby creating ions. High temperatures, electrical discharges, and nuclear radiation can cause ionization.

IONIZATION CHAMBER An instrument that detects and measures ionizing radiation by observing the electrical current created when radiation ionizes gas in the chamber, making it a conductor of electricity.

ISOTOPE Atoms with the same atomic number (same chemical element) but different atomic weights. An equivalent statement is that the nuclei have the same number of protons but different numbers of neutrons. Thus, ⁶C¹², ⁶C¹³, and ⁶C¹⁴ are isotopes of the element carbon, the subscripts denoting their common atomic numbers, the superscripts denoting the varying weights.

LINAC Short for linear accelerator

LINEAR ACCELERATOR A long straight tube in which particles (ordinarily electrons or protons) receive acceleration along their path. The Stanford Linear Accelerator can accelerate electrons or positrons, the anti-electron.

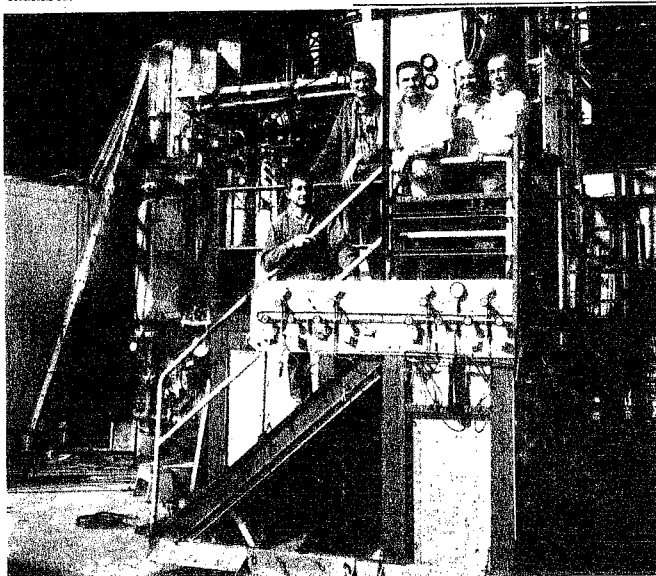
MESON General term for short-lived particles which are strongly-interacting (i.e., participate in the nuclear force) and have either zero or integral values of intrinsic spin. Examples: pi mesons (pions), K-mesons, eta mesons.

MeV One million electron volts.

MOLECULE A group of atoms held together by chemical forces.

MU-MESON See Muon

MUON A sub-nuclear particle with 207 times the mass of an electron. It may have a single positive or negative charge. It is really not a meson, by our definition above, since it has half-integral spin and is not strongly interacting. Sometimes called the heavy brother of the electron.



LRL's 25-inch Bubble Chamber as it looked following final run.

Safety Tips From NSC

The National Safety Council published the following two tips in a recent issue of their *FAMILY SAFETY* quarterly publication:

SLIVERS IN YOUR SOUP?

It pays to buy a good can opener — that's what the Food and Drug Administration found after studying different types of opening devices. Openers that slit the metal with dull, straight blades can prove hazardous. All openers produce some minute metal fragments, but this type produces more and larger fragments, which could cause injury if ingested.

To avoid this, the FDA makes these suggestions:

—Be sure that the blade is sharp; discard the opener if it's dull.

—A rotating blade is more efficient and produces fewer and smaller metal fragments.

—Blade should be kept clean to avoid clogging that might interfere with rotation.

VACUUM BOMB

An Ontario worker was spooning soup from his vacuum bottle recently when the bottle exploded, showering his face with pieces of glass. Although he suffered cut to his face, prompt medical treatment saved his eyesight.

The metal spoon he was using cracked the glass lining. There was an implosion followed by eruption of glass from the mouth of the bottle.

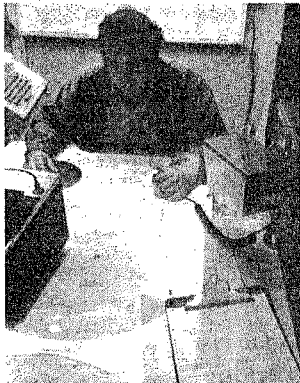
A General Electric worker was eating lunch when his vacuum bottle exploded in his face. Luckily he was wearing safety glasses, so his eyesight was saved.

Take these hints from a manufacturer: Use plastic instead of metal utensils when eating from glass vacuum bottles, and never drink directly from vacuum bottle or get the lid close to your face.

Scanning and Scanners, An Important Part Of Physics Effort

by Rhonda Davé

The Data Analysis Department is comprised of two former departments: Automatic Data Analysis and



my Barrera is one of the senior scanners working on the automatic measuring machine Spiral Reader. Tony, father of 4, is seen with the scanning group for 5 years.

ventional Data Analysis. As any scanner will tell you, there's nothing really automatic or conventional in the analysis of data at SLAC.

cause of the unique nature of SLAC's "business", i.e. producing high energy physics, most of the methods by which it is done are unconventional. Many physicists concerned with theories about



Argaurite Kotwitz (left) has the highest cumulative rating in the scanning department and has been here for over 30 years. Bette Reed (right) is also a senior scanner and is presently back-up supervisor on swing shift. Both women are arbitrators for the United Stanford Employees Association during the recent

mentary particles, design experiments and film to investigate the theories and actually analyze the results, using the services of the Data Analysis Department collect these results. The magnitude of a (in the form of pictures) coming from each experimental run of the accelerator beam, and the complexity of the pictures (there being many reactions of beam particles with target particles) make it necessary for someone to "scan" the pictures, discarding those reactions which are not relevant, and ordering and measuring those which are. Reactions which occur when particles collide are called events. Finding, counting and measuring events take a great deal of time and hence scanning is a tedious and fairly technical

haps the most difficult part of scanning is learning to use the complex team of machines especially designed

for counting and measuring events. Some of the measuring machines are on line to computers where the information is recorded and stored for later use by the physicists. There are several types of machines with which the scanner must be familiar: those used for finding relevant events (scanning machines) and those used for measuring events (Vanguards, NRI's, the Spiral Reader and the Hummingbird). The automatic machines (NRI, Spiral Reader and Hummingbird) are each equipped with their own computer which is programmed to measure with minimal assistance from the operator.

When a scanner sits down at a scanning machine, his job is to look for events relevant to the particular experiment to which he has been assigned. Film is projected, a frame at a time, onto his table top. The scanner looks for an event, determines what kind it is and records information giving its location and kind in a coded-numeric format to be stored in a computer. The film is then placed on and projected onto a measuring machine where the scanner measures and records the coordinate points on each event. This information goes back into a computer where the event is reconstructed in three dimensions and this data is then used by physicists to compute the particle's momentum, spatial orientation, mass and energy. In this way the physicists can deduce what type of particle was produced by the interaction of the beam with the target. If the computer cannot tell what kind of an event has occurred, scanners are asked to do special scans during which they help interpret physics output.

Since there is no particular course preparation possible (one scanner says she was hired because of her artistic ability while another says she was hired for her science background), scanners must be trained on the job. Each person goes through a six month probationary period during which time he is taught the fundamentals of scanning techniques, how to operate the machines, and the basic physics of the particular experiment on which he is to work. There are no other qualifications for a scanner applicant but a certain aptitude for scanning is essential. Louise Shreve, shift supervisor and with the department since



Scanners lounging include (from right) Steven Godfrey (CDA draftsman), Sasha Gregory (Employee's Relations Representative), Oren Anderson, back-up supervisor on Day shift, Jerry Siebe, Evaughn Sims, Marvin Washington (standing) Tony Barrera, Treasure Wilson and Don Rupp.

its inception, mentioned that a good quality to have would be the ability to imagine from abstractions.

Scanning differs in difficulty according to film and experiment, hence rates for speed and accuracy vary widely too. In the last fiscal year, scanners scanned over 4.5 million frames of film and measured almost 500,000 events with rates of over



Here Jeanne Duhem demonstrates placing film on the Spiral Reader. Jeanne is the department's most "senior" scanner and has one of the highest rates in the group.

160 frames scanned per hour and almost 14 events measured per hour. Over the past six years, the scanning and measuring rates have gotten progressively better. This has increased productivity but has also resulted with 4 scanners plus technicians, supervisors, secretaries, programmers, several managers and a group leader and is one of the larger departments at SLAC.

The scanning group itself has been as high in number as 60 but due to the recent hiring freeze, has dropped to its present 45. This drop in personnel has not been accompanied by a corresponding cut in productivity and with the help of the automatic measuring machines, the scanners finished a record period in number of events per hour measured. The hiring freeze along with several other factors, resulted in a period of stress

within the department. In May, scanners voted to join the United Stanford Employees Association and called a "sick-out" strike to protest firing of a scanner. Soon after the strike the scanner was rehired. A former scanner, Sasha Gregory, has also become an Employees' Relations Representative on the Personnel Office staff. In addition to her new project-wide duties, it is certain that much of her initial work will be with her former colleagues in the scanner group.

Many of the standard scanner complaints revolve around inadequate and non-related training programs and machine problems. One scanner acknowledged that if the machines worked perfectly all of the time, scanners would be overworked. The job of scanning is a tiring one, requiring intense concentration for long periods of time. Headaches and eye fatigue are "Hazards of the Trade." Another inherent problem of the job is that it is so highly specialized there are few jobs which relate to it outside of SLAC. Jeanne Duhem noted that while not being time wasted, it, "certainly hasn't prepared me for any other type of work." Jeanne has been with the scanning group for six years and is therefore the most "senior" scanner in the department. When asked why she has stayed so long she replied, "I guess because my friends are here and I feel like I sort of belong after all this time."

Black scanners make up a quarter of the scanning group and two hold supervisory roles. — Glenna Owens is Owl shift supervisor and Bette Reed is back-up



Diane Maue, senior scanner, worked as supervisor on the week-end shifts — which have now been discontinued.

supervisor on Swing shift. Treasure Wilson, a black scanner from Trinidad, stated she had found the department to be completely fair to minority scanners in terms of machine scheduling and so forth.

Group cohesiveness on the various shifts is often given as one of the reasons scanners like their job. Each scanner has his own set of likes and dislikes. Marvin Washington gave the "artiness" of the film tracks as a "like" and also mentioned the scientific-intellectual working atmosphere which appealed to him. Marderos Kaprelian, an Armenian scanner from Syria, mentioned that scanning was very interesting for him as a civil engineering student and that the physicist-scanner contact had helped him a great deal in his courses. Scanners may take up to 6 hours of courses in math or physics at any nearby college each week and receive compensatory time off plus tuition refunds. Many of the scanners are

Continued on Page 7

Christmas In July?

EDITOR'S NOTE: Ruth Paya, former department secretary for the Mechanical Fabrication Shops and a regular contributor to the first four issues of the SLAC NEWS, left SLAC in June to become the Administrative Assistant in the newly formed Neurology Department of the Stanford Medical Center. Ruth wrote the "SLAC Personality" articles in each of the first four issues of the paper, and either wrote or coordinated the submission of a number of the other general interest stories that were printed. It will be difficult to replace her as a correspondent and she will be equally missed by others here at SLAC with whom she worked during her more than six years with the project.

Having taken some creative writing courses from the University of Michigan Extension, Ruth retained her interest in writing even though working at it was somewhat interrupted over the years by the five children that arrived in fairly close order. (Four boys ranging from 12 to 18 are still at home and daughter Suzie is a registered nurse.) Several years ago, Ruth began writing again and last fall, while enrolled in a fiction writing course at the Palo Alto Adult School and also taking a course in technical writing at De Anza College, she decided to enter the annual Christmas Short Story Contest conducted by the Peninsula Living magazine section published by Peninsula Newspapers Incorporated. To her surprise she won the contest and the \$100 prize that went with it! When asked where she got the idea for the story, Ruth said it was an amusing, true account that she had heard a number of years before and had decided to write up.

Here, then, with the kind permission of the Peninsula Living editorial office, is the reprint of Ruth's prize story. It's printed both for its amusing narrative quality and as a tribute to Ruth for the contributions she made in getting this paper started.

...HIS WONDERS TO PERFORM

by Ruth Paya

WHAT? GIVE UP the office Christmas party? Why should I? Might as well expect me to give up cigarettes. I did it, though, and let me tell you how. Not that I gave up cigarettes. Losing one vice at a time is all I can manage, and giving up the office party took all the virtuous effort I could muster.

My old Irish mother always explained away the unusual with a knowing look, shaking head, and the muttered phrase "...the Lord works in mysterious ways..." Whether the Lord or his arch enemy should get the credit for my reform remains unknown; but let me tell it the way it was and you help me decide.

Looking forward to the Christmas party was always half the fun. The secretaries and other girls decorate the office and get in food and drinks; and we have this one hefty character from Purchasing who pretends to be Santa Claus. Then we always shove the desks back and dance. Some of the girls claim the familiar stuff is a bit overdone, but there's always someone complaining about something — and we still manage to throw these very successful parties.

Now, this all began when I attended the office party a year ago. Unfortunately, I overdid somewhat on some sparkling pink champagne Gladys Stover kept forcing on me. So it was that when Gladys drove me home that night and dumped me off at

my front door, my dear wife Kathleen had a good deal to say. She had the wisdom to wait until the next day, however. If she had tried to tell me off that night, I would have just started looking for another drink.

So around noon the next day, she shook me awake. This Christmas party thing, she said, was a burden she had carried year after year with no more than a week's complaining before and a week's "I told you so's" after the event. Now, however, the children were old enough to be involved. I groaned. She went on. Last year, the kids had heard me come home late and with "that Gladys creature." And what about the neighbors? What must they be saying? Well, she had those black no-no eyes on me and right on her side and what could I do? She backed me right up to the wall with a "Well, Louis Joseph, what are you going to do about it?"

I felt too badly to put up a decent fight, so I gave in. Especially when she added that Girl Scout's honor (her strongest oath), if I ever came home like that again from an office party, she would hit me right over the head. This from the woman who had never raised a hand to me except to do good with it. And silly as I considered the oath, I knew she used it sincerely.

So, with my conscience aching as badly as my head, I found myself raising my hand and swearing "on me dead mither's grave" (MY most serious oath) to give up the office Christmas party in the coming year.

Well, that was a year ago, and here it is Christmas again; and, with Kathleen's help, I have not forgotten my promise. You find me about to leave my office as the party is starting to swing. Herman Schultz is still Santa Claus, the new secretary's doing a go-go dance in her mini-skirt, and the water cooler has been spiked with the usual; but I am super-sober, sanctimoniously stuffy and still mindful of this morning's mass. There I renewed my vow of a year ago — no office party for me. I hadn't touched a drop of liquor, nor an ounce of sweet Gladys; and laden with gifts I was going to arrive home on time and cold sober. All my family could rejoice. However, I found I would need a ride home.

My wife had kept my car to do some last-minute shopping, and the transportation I'd counted on was cancelled out when Miss Mini-Skirt took out an option on my pal — a complication I had not even considered. They were staked out at the water cooler, oblivious to me, but no big thing. I'd just call a cab.

Full of righteous good will, I called my wife to tell her I'd soon be home. She offered to come get me but I didn't want her leaving the children and coming out in the snow and cold. I would take a cab.

"Oh, Louis Joseph you're such a dear. I'm so glad you're coming straight home." I heard her calling the kids: "Joseph, Mary, Bridgit, little Louie, Daddy's coming home. Go get wood in for a fire and hurry with that snowman. Then, back to me, "Oh, Louis, the tree looks so pretty, and be sure and notice the kid's snowman as you come in — they've spent all day working on it. They found that old broom that you use to clean the garage and they borrowed your old golf hat. But don't scold them about it, please dear, they promised they'd be careful of it."

"Katie, my love," I cooed, controlling my impulse to be profane, "I am not the ill-tempered beast you would make me out to be. Of course I won't yell at them."

So I hung up and called for my taxi. Troubles of the season. No taxi; but there was a waiting list. Same story everywhere

— and THEN is when I got my great idea. Let me explain.

Each holiday season, our city puts this Santa's Helpers kind of plan into effect which is essentially a method of avoiding traffic accidents by getting intoxicated celebrants safely home. Anyone who knows he's had too much to drink can call the police or sheriff's office and a volunteer helper is sent out to drive him safely home. An ounce of prevention, you know. So I decided to call the sheriff's office. I would pretend to be drunk enough to need a ride home — and



RUTH PAYA

that, I believe, is when the Lord began working in one of his mysterious ways.

Oh, yes, I called Santa's Helper. I must have sounded convincing enough to warrant their services because the friendly voice at the other end, after questioning where I was, promised to have someone pick me up within minutes at my building. Elated, I gathered up my packages, eluded my partying companions, and made it to the front door. There I found another candidate for a ride home leaning against the wall and reeking of John Barleycorn. His droopy state reminded me to feign an alcoholic slump of my own and at that I saw the sheriff's car, red light flashing, drawing up in front.

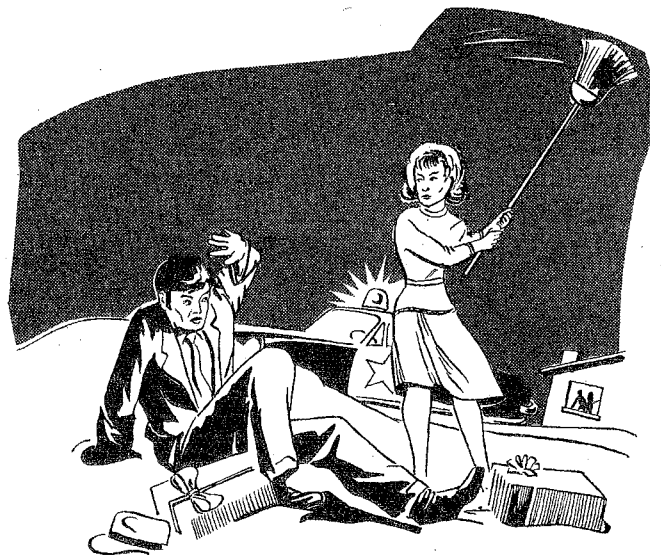
Santa's helper managed to get my packages and our other passenger into the back seat and then he helped me into the

front. It soon became evident, however that not only our passenger but the good samaritan driver himself had had more than his share of Christmas cheer. Well even the best of us fall from grace when our resolutions are weak and temptations are strong. Perhaps he'd had one or many "thank you" drinks from other grateful riders. In any case, I could not bring myself to censure the good man to much. After all, he was trying to get me home. A hectic and traffic-eventful 15 minutes later, I could see the lights of my house as we came barreling down my hill. And then it all began to happen. The blithering, happy-go-lucky, half-stone Santa's helper did me in. With the light on the top of the car swinging in wild circles and his siren going full-bore, I screamed up to a halt in front of my house.

How could this be? And me with nothing but good intentions! Faith a begorra! There at the door was my wife with the kiddies and beside the walk could see a magnificent snowman complete with hat and broom. I could also see my neighbors peeping out from behind their curtains; and with the banshee siren still going, I saw a few beggars to venture down their walks. Curious and concerned at my unusual arrival, the probably thought someone needed help. I would show them. I had come home decent and sober man and needed no help. I gathered up my gifts with some difficulty from beneath my inebriated and now sleeping friend in the back seat. It meant a bit of trouble getting out of the car, but finally ready, I waved my questionable helper off and turned to greet my family.

I took a careful step forward on the icy sidewalk, then one more, and then happened. I slipped and lurched forward forced myself back, lost my balance, and with one more flailing awkward lung pitched head first into a snowbank. Dazed, unbelieving, I came sputtering out of the snow to see my package scattered all over the street and neighborhood gathering from all directions. I also saw my good wife seize the broom from the snowman's icy grasp and come running down the walk. Words from a year ago came back to me: "...and I tell you Girl Scout's honor, Louie Joseph, if you ever

Continued on Page 5



Original illustration by Don Lindquist. Redrawn by Norman Chin, Tech Info.

Greg Minshall Receives Merit Scholarship Award

Shortly before his 17th birthday in April of 1969, Greg Minshall of Los Altos, then a junior in Los Altos High



GREG MINSHALL

School, came to work part-time for the SLAC Facility of the Stanford Computation Center. His job has been that of programmer trainee doing primarily graphics-oriented systems programming. The assignment was on a trial basis and came about because Greg had been highly recommended to Chuck Dickens of the Facility as a highly capable young mathematician and potential computer scientist. The experiment worked out and Greg is still here on his second summer of part-time assignment.

Recently, it was announced that Greg was the 1970 Syntex Merit Scholarship Award Winner. His mother, Mrs. Martha Minshall is in the corporate accounting department at Syntex, and Greg was one of 16 Midpeninsula high school seniors named as winners of the four-year award. Greg plans to attend the University of California at Berkeley this fall where he

will major in either mathematics, computer science or biology, with plans to go on to graduate school in the field he finally elects.

While here at SLAC, Greg has made several significant contributions to the operation of the Comp Group's IBM 360 Model 91 Computer and its peripheral equipment according to Mel Ray of the Comp Group. The graphics-oriented work, for example concerns cathode-ray tube displays of job status within the computer at any given time. There are eight IBM 2260 display units located about the project, each with its own command-type keyboard. These were programmed with IBM software to present, on command, five different status information displays concerning the various programs going on within the Model 91 at any given time. Greg not only added two information status displays to this system, but also modified the existing IBM display system so that it was more compatible to SLAC needs regarding specialized information. He continues to work on additional modifications as required.

Greg also contributed to what is known as the Multiple Console Support System with the IBM 360/91. This is a means of computer monitoring and control whereby one operator is only required to monitor the tape status of the computer, while another may monitor only the disks, rather than having any single operator at one station trying to monitor all functions. Again, IBM had a system for handling this function but Greg, using standard software, implemented the system so that it met SLAC's needs. Greg also wrote a technical memo for SLAC that describes certain of the internal workings of the Multiple Console Support System.

Although Greg's employment here at SLAC is unusual because of his age and because of the level of responsibility he was given, and mastered, it is not unique in that we have had gifted high school students working on the project before, primarily as un-paid student observers, but several of them, like Greg have proven their ability to the extent that they have been put on a part-time pay basis.

Christmas In July?

Continued from Page 4

come home like that again I will hit you right over the head." That's what she had said, and that's what she did — right there in the sight of the Lord, in front of the children, the neighbors and the bloomin' jolly snowman. Flailed me good, she did, then stamped back up the path, gathered in the children, and slam went the door. Never had I seen my good wife angry like that and never before had she denied me the comfort of my children.

"Tis wise to keep a good reputation. Innocent though I was of intended harm, I still was thought to be guilty. It was obvious that everyone was thinking: "Callahan's been at the office Christmas party again!"

* * *

For those of you who like happy endings, let me assure you that despite all that happened, things turned out all right. My neighbors helped me to my feet, gathered up my packages, and when they heard my story and realized I was truly sober, went laughing up to the door with me. There they convinced my good wife of the truth of my tale and full of remorse, she and the children fell upon me with cries of apology and delight. So, all things considered, including the mysterious workings of the Lord, we shared a Christmas made memorable by the exchange of understanding and love. For mysterious working of the Lord, blessings such as these, only a fool would prefer the office party.

Happy Yuletide to y'all!

Dental Care At Foothill J.C.

Foothill Junior College Dental Hygiene Clinic offers these low-cost dental services:

Cleaning: \$2.00
Fluoride: \$1.00
Bite-wing x-rays: \$2.00
Full-mouth x-rays: \$5.00

Before you can have x-rays you must 1) have your teeth cleaned at the clinic, and 2) have your dentist tell what kind of x-rays you need.

ANYONE may use these services, including children. Call for an appointment at: 948-8590, extension 335. (Allow yourself about two hours waiting time at the clinic.)

For more information: see Sasha Gregory, Employee Relations Representative, Personnel Office.

DOES TIME RUN BACKWARDS?

by Steve Kociol

In investigations of the mystifying nature of the sub-nuclear world, there are relatively few guidelines for the experimenter to hang on to. As a result, what guidelines there are must be valid beyond doubt.

One guideline is the principle of relativity as originally formulated by Einstein and applied to particle reactions at ultra-high (relativistic) speeds. As an example of how this principle is applied, it was known before SLAC was built that its electrons could not quite attain the speed of light no matter how much energy they were given. A more subtle example of how physicists rely upon relativity theory is shown by how they transform data from one frame of reference to another. Very often it's important in analyzing (say) an electron-proton collision to do calculations in a frame in which the electrons and protons are viewed as coming at each other from opposite directions (the "center of mass" system) rather than the more usual frame in which the proton is at rest in a target and the electron comes toward it. The theory of relativity provides the formulae necessary to transform the data back and forth between these frames of reference.

Another guideline that has been used extensively is the notion of "invariance under time reversal," or T-invariance for short. A SLAC-Berkeley collaboration completed a test of the validity of this principle. SLACers associated with the experiment were R. Cottrell, J. Litt, now at CERN, L.W. Mo, now with the Enrico Fermi Institute, and R.E. Taylor of Group A.

The T-invariance principle says, very simply, that if you make a movie of a few particles interacting in the subnuclear realm and then run the movie backwards what you see in the movie should also occur in nature.

Now, this principle certainly does NOT hold for large scale phenomena. If we take a pound of black sand and mix it thoroughly with a pound of white sand, the result will be a homogeneous mixture. It is certainly NOT common experience that continued mixing would cause the black and white components to separate from each other.

Although T-invariance had long been

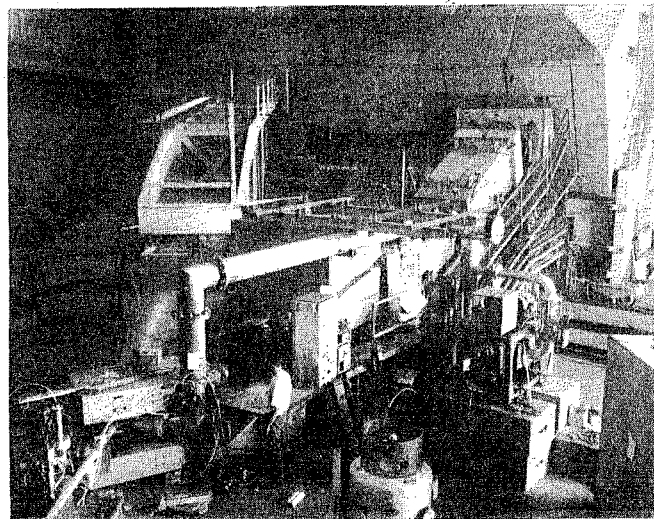
thought to hold on the microscopic level, some recent results indicating the failure of similar symmetry principles led to the SLAC-Berkeley effort. The experiment consisted of the analysis of electron-proton collisions produced when the SLAC electron beam was directed into hydrocarbon targets in End Station A. The 20-GeV spectrometer counted the scattered electrons.

A special feature of the target was that it was "polarized." A proton has an intrinsic property called spin. It may be thought of as spinning about an internal axis, just as the earth does. All protons have the same amount of spin. If you take a large number of protons, the net spin of the system will be zero on the average since the protons will be spinning in random directions. However, it is possible to line up the spins of at least a non-negligible fraction of the protons in a target, providing the target as a whole with a net spin. When such a system has net spin, it's said to be polarized.

The first part of the experiment had the net target spin pointing in a direction we'll call "up." Electron-proton collisions were analyzed. The experimenter determined the number of electrons going into the spectrometer. Then, after about three minutes, the target's net spin was reversed, so that it was in the "down" direction. Again electrons were counted after collisions with the target. This process was repeated until tens of millions of counts had been registered.

If T-invariance is a correct description of nature, we would expect the same number of electrons to be counted independent of the target spin direction. This is because if you make a movie of a top spinning clockwise and then run the film backwards, the top appears to spin COUNTERCLOCKWISE. So, reversing the target's spin is equivalent to running the experiment backwards in time.

What about results? After devoting four months to the experiment, it was indeed found that the number of electrons scattered into the spectrometer, all other things being equal, was independent of target spin. Thus the principle of invariance under time reversal seems to hold, at least for the electromagnetic interaction between electron and proton.



Experimental setup for the time-reversal experiment. The polarized target is at the common pivot of the 8 and 20-GeV/c spectrometers. The target was built in Berkeley by a group headed by Nobel prize-winner Owen Chamberlain and installed at SLAC for the experimental run.

AEC Lab Develops Nuclear Probe To Spot Minerals On Ocean Floor

A nuclear probe to detect valuable minerals on the ocean floor has been successfully demonstrated by scientists at the Atomic Energy Commission's Pacific Northwest Laboratory at Richland, Washington.

The undersea probe can spot elements such as gold, silver, copper, and manganese in quantities as low as one ounce per ton. The device, designed to operate from either a surface ship or submersible vehicle, can identify kinds

and quantities of elements in ocean floor mineral deposits within three to five minutes. From 10 to 30 elements are detectable.

Battelle-Northwest scientists at Pacific Northwest Laboratory foresee use of the probe in locating undersea mineral deposits of commercial value and as an aid in geophysical mapping of the ocean floor.

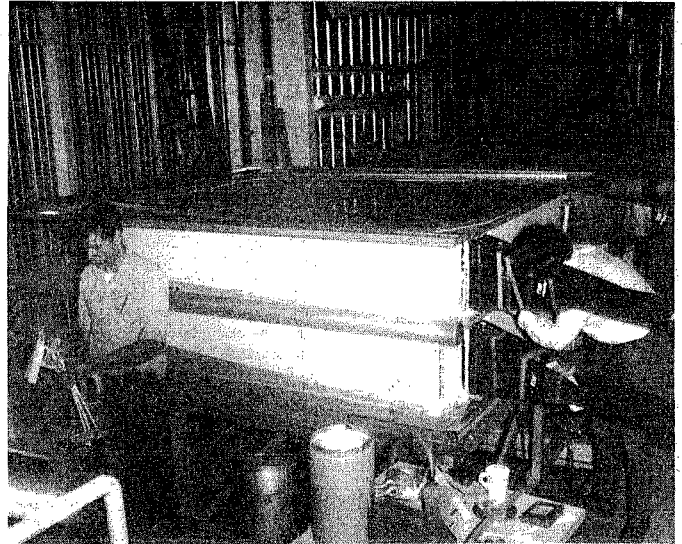
In the initial test, 200-pound mineral samples containing gold, silver, copper and manganese were placed on the ocean bottom at Sequim Bay, Washington. The elements were detected and their amount measured with a probe containing 0.2 milligrams (about one one-hundred thousandth of an ounce) of the man-made element Californium-252 and an extremely sensitive gamma-ray detector.

The new technology employs ultra-low level and rapid neutron activation analysis as opposed to laboratory analysis. The Californium-252 emits neutrons which are absorbed by the minerals being measured. The minerals then give off energy in the form of gamma rays which are picked up by the detector. The amount of an element in a mineral is proportional to the number of gamma rays emitted.

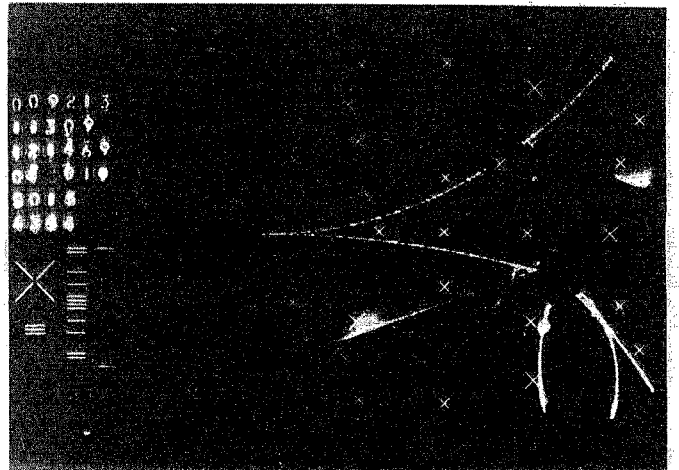
The Californium source is in a sealed stainless steel cylinder, approximately one-half inch in diameter and three inches long, which is located at the end of the probe.

This rapid analysis procedure consists of a one- or two-minute exposure of an area a few inches in diameter on the ocean floor with the Californium source, followed by a similar counting period with the detector. The induced radioactivity poses no environmental problem since the residual radioactivity in the ocean floor is nondetectable several hours after the irradiation.

Battelle-Northwest's Research and Development program calls for the development of a working prototype instrument which can be used for mapping minerals in depths of 1,000 feet.



Kirk Bunnell, (left) and David Stone of Group D, putting finishing touches on the streamer chamber prior to its successful July turn-on. The chamber itself, three layers of aluminum mesh each separated by 40 centimeters, can be seen with scintillation counters in place, to help analyze the identity of decay tracks.



A picture taken with SLAC's streamer chamber. Shown is a neutral K meson decaying into a negative muon (upper track), a positive pi meson (lower track) and a neutrino (doesn't leave a track since it is uncharged).

At County Fair

Continued from Page 1

Mechanical Design and Fabrication Department.

The second part of the presentation will be concerned with some aspects of the physics done here with the electron beam. In particular, use of the electron beam in producing beams of secondary particles and investigations of interactions involving these particles using bubble chambers will be discussed.

Ed Couch, Fair publicity director, expects that over 400,000 people will visit the fair. As a result, our participation should increase the community's awareness of exactly what goes on at the world's longest accelerator.

Of course, other events of interest will be going on during the Fair's ten-day run.

The Pageant for Miss Santa Clara County will take place Saturday, July 25 and she will be selected from ten finalists. She will reign over the Fair for ten days, and will serve throughout the year as Miss Santa Clara County and represent the County in the 1971 Miss California Pageant at Santa Cruz.

A Roaring Twenties theme will be used in the Agricultural Exhibit this year in Exposition Hall. Old time cars, antique fire engines, and a player piano will be featured with special glassed-in exhibits from the twenties. Grange exhibits, Future Farmers, 4H, and student industrial participation programs will also be in Exposition Hall.

The National Fast Draw Championships will be presented by the Valley Gun Hawks in a specially built old western town on the Fairgrounds. The town features a saloon, undertaking parlor, jailhouse, bank and livery stable, and will serve as the center of all western activities at the Fair.

The Foley and Burk Combined Shows Carnival will provide entertainment for young and old during the Fair with its rides, programs, calliope music, and traditional Ferris Wheel and Merry-Go-Round.

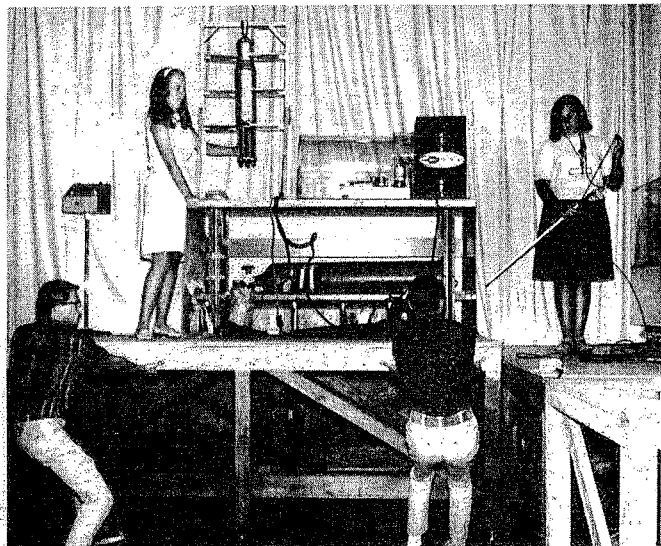
SLACers who attend the fair will have many interesting activities to choose from.

Letters To The Editor

Dear Editor:

I find it difficult to understand why this column has been barren except for one issue of the NEWS. It's understood that things political aren't acceptable because they could totally monopolize the paper, which normally will remain at its four-page format. Someone must have some other things to gripe about or comment on, however, and we'd like to see them in print.

Sincerely,
Jack Sanders



Santa Clara County high school students move United Technology Corporation's exhibit into place at last year's Santa Clara County Fair Industrial Participation Program.

Streamer Chamber Back In Operation

SLAC's two-meter streamer chamber, the world's largest, is back on the air after a six-month rebuilding. The rebuilding job was occasioned by an accidental overvoltage of the chamber. This produced carbon paths along the walls making it impossible to sustain the very high voltage necessary for operation.

The chamber has been doing fine during the July operating cycle. So far, 300,000 pictures have been taken and the chamber is having little if any trouble sustaining 800,000 volts.

The SLAC Group D experiment now underway has been described in Vol. 1, No. 2 of the SLAC NEWS, and involves some properties of the neutral K meson. The experiment will continue through the August and September cycles. The experimenters hope to take 2 million pictures of neutral K meson decays.

SITE TOUR ARRANGEMENTS

The Public Information Office gets frequent requests regarding site tours both from outsiders and from SLAC people. They want to know such things as: Are tours given on a scheduled basis? Do we have tours during the summer as well as the school year? Can individuals come on a tour or must it be by group arrangement? How long does a tour take and what does it encompass?

First, all tours are on an arranged basis, at mutually convenient times,

rather than on a scheduled basis. Arrangements can be made generally Monday through Saturday, however, and there usually are sufficient requests so that PIO often conducts two tours a day. This includes the summer as well as the school year, though school groups nearly monopolize the school week. (Thirty-one tours were conducted in June, for example, with over 3,000 people attending.) Normally, one to two weeks advance notice is required to set up a group tour in the summer, and three to four weeks during the school year.

Individuals who want to come on a tour can usually be accommodated by being joined to a group that has already made arrangements. Also, when enough individual requests are received, a group tour is set up, if possible, to take care of the individual requestors.

No drop-in tours are provided by Public Information.

The average tour takes 90 minutes and starts with an orientation and question/answer session in the Auditorium. This is followed by a bus tour of the site with a stop in the Visitors' Alcove of the Klystron Gallery and a drive through the experimental area. This procedure can vary slightly depending on the size and makeup of the touring group, the operating status of the machine and the like.

Special tours for technical visitors are also arranged through PIO, although the speaker may be from one of the technical groups. Also, PIO can provide a speaker for off-site talks on occasion.

If you wish to arrange a tour, have visitors come on tour, or want additional information on tours, call PIO on extension 2204.

WEDNESDAY FILMS

For August Schedule

AUGUST 5 LAST REFLECTIONS ON A WAR (Vietnam)
Last report of correspondent Bernard Fall (NET Film Service 1968)

AUGUST 12 LEONARDO DA VINCE
Portrays his career, shows many of his great paintings.

AUGUST 19 CARS IN YOUR LIFE
Humorous film about the motor car and our crowded highways.

AUGUST 26 ANDRES SEGOVIA
World renowned guitarist recalls his youth, and his musical career.

These films are shown in the Auditorium at 12:30 Wednesday noon each week, unless otherwise indicated because of varying lengths of the film. You are invited to bring family and friends out for any of the presentations and the PIO people on extension 2204 welcome suggestions as to films for the program.

Scanning

Continued from Page 3

part time students and a few attend full time. Diane Maue, art history major, thinks scanning is the best job a student can get. Many scanners are as Don Rupp "...only in it for the money." But some, such as Ann Hall, really enjoy the work and the people as well.

Unlike other SLAC staff, scanners work a 7 hour day and are paid for their lunch and coffee breaks. They are eligible for all regular SLAC benefits and in addition they have their own departmental benefits such as their scanners lounge.

Scanning is interesting from the standpoint of its relationship to physics, but once mastered the job becomes a series of automatic motor responses. Dwight Johnson, a former scanner and currently data aide, described scanning as a really mindless job - "something like electronic meditation." Changing experiments and unusual events help keep the scanners from becoming bored. A radio with earphones is supplied for the scanners to be used while they are working on the machines.

When asked why they have stayed on as scanners, "senior" scanners often cite the relaxed working atmosphere and group friendships as reasons. Also many scanners feel that the pay is good for the amount of education and technical qualifications required for the job. The group leader, John Brown added "plus it's a guaranteed, socially acceptable, non-toxic, 8-5 job" ... and what more could one ask?

WANT ADS

FOUND: A decorated gold band (wedding or friendship ring) turned in to A & E Bldg. Receptionist. Found in Auditorium parking lot Monday, 7/13/70.

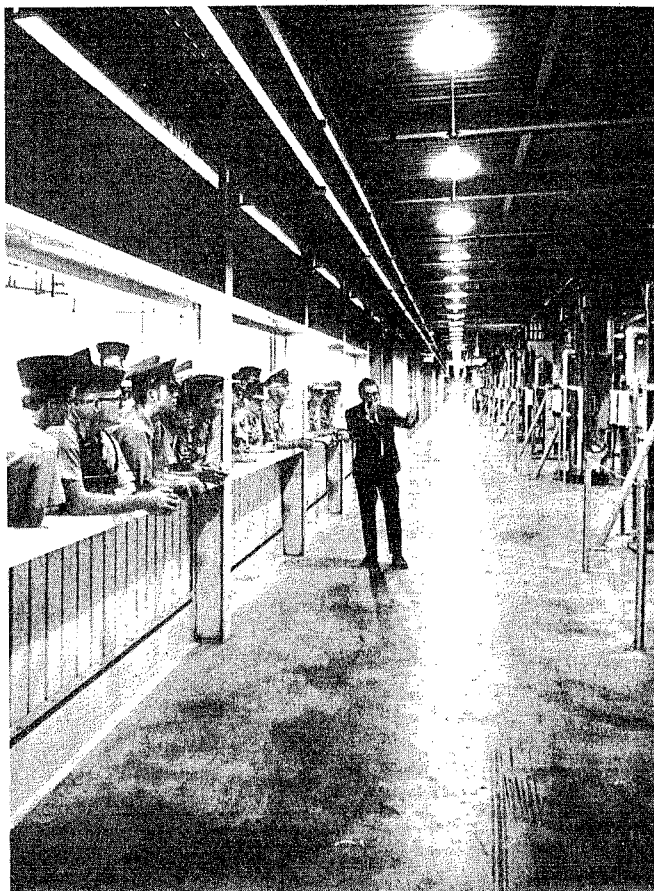
THANK YOU! To the so many wonderful people at SLAC for the cards, gifts, phone calls and concern during my recovery from a recent automobile accident. VICKY OLIVER, Comp. Center

FOR SALE: Triumph TR-3. Good condition. New tires, battery, carpeting, top. Has radio, wire wheels, tonneau cover. \$695. Steve Kociol, ext. 2204 or 732-5519.

FOR RENT: Small, secluded cabin, ideal for recreation or retreat, Del Monte Forest, Carmel. Available \$40/weekend. Call Mike Menke, ext. 2775 or 941-2093.

NOTICE: RACIAL, RELIGIOUS OR ETHNIC DISCRIMINATION in the Sale OR Rental of Housing is absolutely ILLEGAL. If you are experiencing discrimination in housing, call for free assistance. MIDPENINSULA CITIZENS FOR FAIR HOUSING, 321-1718.

WANTED: Voluntary regular contributor to SLAC NEWS. No journalism experience necessary, but an interest in seeing that as many areas of project activity as possible receive coverage. Call ext. 2204.



A group of Civil Air Patrol Cadets receive briefing on Klystron Gallery from inside Visitors' Alcove at Sector 27.

Bob Gould of Plant Engineering sketched this cartoon version of SLAC's Paleoparadoxia. A different version of what the creature looked like and the story of the finding of the 15-million-year-old bones is told in the display now back in the Auditorium Lobby. This display had been at the Palace of Arts and Sciences in the Marina in San Francisco for most of the past year together with the rest of SLAC's major exhibit at that facility.

Plaster casts of the bones of the Paleo were prepared for SLAC by the Paleontology Department at the University of California at Berkeley and are now being assembled here for display. A story covering the creature together with the preparation of the new display will be told in a later issue of the NEWS.



SLAC NEWS

Stanford Linear Accelerator Center

Jack Sanders Editor
Steve Kociol Associate Editor
Walter Zawojski Graphic Artist

Regular Contributor:
Dr. Charles Oxley, PIO

Published by
SLAC's Public Information Office
P.O. Box 4349, Stanford, Calif. 94305
Telephone 415 854-3300, Ext. 2204

SLAC PERSONALITY- CONFERENCE HELD

Marco Buenrostro

Marco Buenrostro, lead man for the Electrical Operations section of Crafts Shops, came to California on vacation from Chicago in the Spring of 1965. He saw the Bay Area and SLAC; decided both were for him; quit his electrical troubleshooting and maintenance job with International Harvester in Chicago; moved wife and five kids out; and joined the SLAC staff. Liking the friendliness, cooperative attitudes and informality of people on the project, he's glad he made the decision.

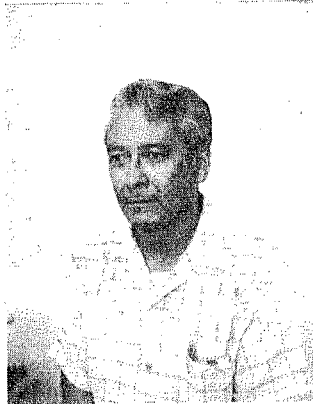
A native of Chicago, Marco's interests in high school were the track and boxing teams, and he sang first tenor with the chorus. He also attended college there at the Illinois Institute of Technology, The Art Institute of Chicago, and the Ray Vogue Schools of Art. He's continued night school out here, studying part-time at Foothill.

The Army interrupted Marco's education, as it did for many in the '40's and he wound up with the Infantry, first landing at Omaha Beach in France and then joining the 88th Infantry to serve in Italy. High points for him while in Italy were receiving the Presidential Citation and Croix de Guerre for his company from General Mark Clark to whom he was introduced, and, almost apart from the war, singing Gounod's "Ave Maria" at a special Easter Sunday Mass at Montecatini in 1945. The choir loft from which he sang was 100 feet above the floor of the cathedral!

After returning to Chicago following the war, which he said he could hardly believe was over when the word was given, Marco continued his education, married, and worked for both U. S. Steel and Wisconsin Steel Works as an electrical troubleshooter before joining International Harvester. Of his five children, two of them are now in Stanford with his son, Paul, studying Electrical Engineering, and his daughter Livvie studying languages. Of the other three children, one is in high school, one in junior high, and one in grammar school.

With his troubleshooting job here at SLAC, Marco has experienced many memorable events, a number of which he would prefer not to have happen again. One of his first nightmarish experiences occurred on September 9, 1967, at the formal dedication of SLAC. Working with Marty Grushkin, SLAC's then communications man, Marco had helped set up and checkout the sound system for the ceremony whose speakers included AEC Chairman Glenn Seaborg, Congressman Craig Hosmer of the Joint Congressional Committee on Atomic Energy, President Sterling of Stanford, White House Science Advisor Donald Horning, and Edward Ginzton, Varian Associates president and an early planner of Project "M" which became SLAC.

Five minutes before the program was to begin, outdoors and between the A & E and Auditorium, there was a complete failure of power to the sound system. The circuit breakers for the system would immediately drop out each time they were thrown to complete the circuit. Finally, it was determined that one of the TV networks had plugged a recorder into the sound system and their plug had been shorted by a lady who had stepped on the connection with a spiked heel. That situation corrected, the program began only ten minutes late and proceeded perfectly, but it was a long ten minutes



MARCO BUENROSTRO

for all concerned, especially Marco and Marty!

On another occasion, Marco's alert reaction was credited with preventing an electrocution on the project. This happened in the Spring of 1968 when an electrical subcontractor was removing insulation from a 12,000-volt feeder line that was still energized. Marco had come by to check the operation, heard the corona noise from the high-voltage cable, and immediately stopped work on the cable until the circuit was turned off and properly identified. In a letter of appreciation to Marco, Dr. Panofsky wrote, in part, "There is no question that your alertness prevented the electrocution of the electrician working for our subcontractor."

On the lighter side of life at SLAC, Marco's main interest has been with the SLAC Choral Group with which he has been active and a prime mover almost from its inception here on the project. He speaks of this involvement as "pure relaxation with a fun group," but some wonder if it could be all of that for him as he has written two of the group shows, "Gone Latin" and "Dream of Love," and has been one of the hardest working and staunchest supporters of the Group's efforts.

Marco's other hobbies are guitar and piano, and painting and wood carving for both fun and profit. He also likes hiking, hunting and fishing, and just getting off into the mountains or desert to get away from people and also do a little rock hounding. Gardening has become another project for him and he's recently moved from Mountain View to Saratoga where he's got a big yard full of fruit trees and flowers. He also can grow grapes down there and make a jug of vino or two. He says his main problem with all of this is "time," and one would THINK this would be a strong complaint from anyone as active as Marco.

Director Receives Award

The Franklin Institute of Philadelphia recently announced that SLAC's Director, Dr. W.K.H. Panofsky, will be the 1970 recipient of the Franklin Medal. The venerable Institute cited Professor Panofsky "for his contributions to high energy physics, and particularly for the solution of many complex engineering problems concerned with the design, construction and use of the eminently successful high energy linear electron accelerator at Stanford University."

"Pief," also noted for his work as a

Continued from Page 1

six months beam transport apparatus will be rearranged to somewhat "unload" the central research yard and consequently increase experimental capability in the region downstream of End Station B. The net effect of this will be to increase the number of electronic counter experiments capable of being run from three to five, to provide a new charged particle beam to the 40-inch bubble chamber, and to simplify the central research area. A negative K-meson beam will be provided for the SLAC two-meter streamer chamber. A committee, with members from Caltech, the University of Washington, and SLAC, has been set up to coordinate the rearrangement.

Ed Seppi, head of EFD, welcomed new and old users and gave a brief



CALTECH'S PROFESSOR FEYNMAN ONE OF FEATURED SPEAKERS AT USERS' CONFERENCE

inventory of services available to users.

The morning session concluded with Burt Richter outlining SLAC's plans for constructing a positron-electron storage ring facility. A separate story about this will be printed in a later issue of the paper.

The afternoon sessions were devoted to general discussions on SLAC's experimental program and schedule, computers for users, and the general outlook for SLAC and its users.

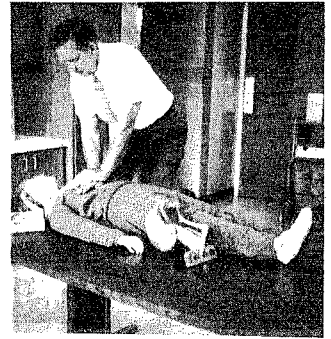
Gerry Fischer noted that the trend toward more outside user participation at SLAC has resulted in almost half the accelerator hours being used in support of user experiments. This is a distinct improvement over the previous ratio of one-third.

Dr. Ballam discussed SLAC's intent to increase bubble chamber picture taking. It is hoped that some 6.5 million pictures can be taken during fiscal 1971, as compared to only 4 million in fiscal 1970. This increase is due to the curtailment of bubble chamber activity at other labs. The Bubble Chamber Operations group under Bob Watt will be strengthened so that both the 40-inch and 82-inch chambers can be run simultaneously.

The discussion on computers centered around methods for increasing and systematizing user services. Several

nuclear test ban negotiator and for his outspoken stand against the Safeguard anti-ballistic missile system, has directed the construction and operation of SLAC since its inception in 1961.

The medal will be awarded to him formally at a banquet in Philadelphia on October 21. It is the highest award granted by the Franklin Institute and is given in recognition of achievements in science or in the applications of science to industry.



Fire Chief Harry Lund demonstrates heart-lung resuscitation on training manikin.

Heart-Lung Resuscitation Demonstrations

The Safety Office announces that, for those who have not attended previous sessions or who have not practiced heart-lung resuscitation on the manikin for more than six months, demonstrations are given in the SLAC Fire Station on Tuesday mornings. Demonstration and practice sessions may be arranged at workplace locations also.

An objective of the Laboratory safety program is 100% training coverage of SLAC operators, electrical-electronics, crafts, monitors and surveillance type occupations. Those not included in the above groups are encouraged to take advantage of the readily available opportunity to learn and to practice this life-saving skill.

FOR FURTHER INFORMATION, CALL THE SAFETY OFFICE - EXT 2221

relatively small computers will be made available for users and the systematics of using the big machine, SLAC's IBM 360/91, are being codified.

SLAC's Director, W.K.H. Panofsky, rounded out the day's activities with a discussion of SLAC's general outlook, followed by the presentation of four suggestions regarding more users at SLAC.

Points made with regard to SLAC's outlook are basically the same as those Dr. Panofsky made at his recent series of talks to employees. SLAC's funding and manpower are to remain essentially flat in the near future. Out of the current budget, some \$2.2 million would go to the storage ring facility, requiring that SLAC conserve beam transport components as much as possible.

SLAC will continue to innovate. In addition to the storage ring, fast-cycling bubble chamber research and construction of a large wire spark chamber spectrometer are underway.

SLAC's various minority employment and training programs will continue with no budgeting cutbacks. These represent a cost of roughly \$200,000.

Dr. Panofsky came out strongly in favor of more user participation at SLAC. He brought up for discussion four suggestions he had received in this regard. The most discussed suggestion was that SLAC consider hiring roughly fifteen physicists to act as "User's Men at SLAC." They would coordinate SLAC user participation. This idea received a great deal of discussion, mostly favorable.

The conference concluded around noon on Thursday, June 18. The group met in two parallel sessions that morning. One session was for people interested in counter and spark chamber experiments while the other was involved with bubble and streamer chamber experiments.