The Interaction Point

Events and Happenings
in the SLAC Community
September 1991, Vol. 2, No. 9

A Message From the Directors

THE TIGERS ARE COMING

AS YOU KNOW, the Department of Energy Tiger Team will arrive at SLAC on October 7 and will be here for about four weeks. Each person at SLAC and at SSRL should have received and read by now the brochure entitled *Tiger Team Preparation Guidebook*. The guidebook contains information that can be very helpful to you in any dealings you may have with members of the Tiger Team. We urge you to become thoroughly familiar with it.

Please cooperate fully with Tiger Team members. If you can answer the questions they ask, do so honestly and without reservation. If you cannot answer the questions, simply admit that you do not know the answer, then promptly try to find out and get back to them with the correct information.

The Tiger Team's assessment of SLAC and SSRL in matters of environment, safety and health is very important for the future well-being of our laboratories. In your dealings with Tiger Team members, each of you is an ambassador who represents us to the outside world. Please take your role as ambassador seriously, and give it your best effort.

Burton Richter — Director of SLAC

Arthur Bienenstock — Director of SSRL

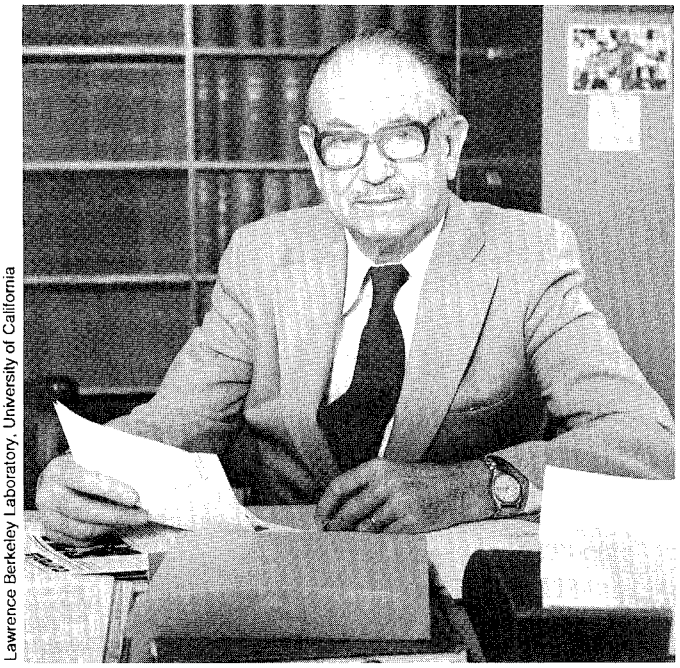
PIEF REMEMBERS EDWIN M. McMILLAN, 1907–1991

THE WORLD LOST ONE OF ITS GREATEST scientists and a wonderful human being with the death of Edwin M. McMillan. At the same time SLAC lost a friend and supporter. Much has been written and will be written about McMillan's scholarly contributions. He is best known as the co-discoverer of plutonium, an achievement for which he received the Nobel Prize. He made innumerable contributions during the early days of radiochemistry, discovering many isotopes and assessing their properties. Of interest to SLAC, he was the discoverer of electron-positron pair production in the field of the nucleus.

During World War II McMillan made great contributions in diverse fields, characterized by ingenuity and simplicity. Yet he was a superb mathematician and analyst, always starting from fundamental principles and insights. After the war he returned to Berkeley and his most famous contribution was the discovery of phase stability which is the property of particles accelerated by radio frequency fields to remain "locked" in phase under certain conditions. That same insight occurred simultaneously to V.I. Vexler in the Soviet Union, and they shared the Atoms for Peace Prize for that achievement.

Phase stability ushered in a veritable revolution in accelerator design. While hitherto the energy attainable by cyclotrons was limited, the invention in effect extended almost indefinitely the energy attainable by proton accelerators (both linear and circular) and by storage rings. Also, previously the only type of electron accelerator capable of easily reaching the 100 MeV range was the Betatron, but it ran out of steam soon thereafter due to synchrotron radiation. McMillan's (and Vexler's) invention led to the construction under his direction of the 300 MeV electron synchrotron. The principle of phase stability has made it possible to go on from there to all the electron synchrotrons and storage rings now in existence, including those at SLAC and SSRL. Last year McMillan was awarded the National Medal of Science; due to his immobility the award was received from the President in Washington by McMillan's three children and their spouses.

Yet with all these tremendous contributions to physical science and the recognition he received, McMillan remained primarily a student of nature, curious about everything ranging from astronomy to insect-devouring plants. I have never known as comprehensively curious a mind, a person genuinely enjoying everything that nature had in store. He was interested in crystal structure, in the revelations about the genetic code and in geological formations, in addition to his comprehensive knowledge of things physical and chemical. He considered revelation of truth about



Lawrence Berkeley Laboratory, University of California

nature to be one of the great experiences to be enjoyed throughout life.

I have known McMillan for a long time, and my wife Adele has known him even longer. He was a friend of Adele's parents in Pasadena, where his family lived and where McMillan was an undergraduate at Cal Tech. Adele fondly remembers him as a fellow who came to visit her folks and played with her toys, usually breaking them. He taught her how to set off firecrackers under tin cans, to the great dismay of her parents.

McMillan's comprehensive knowledge and enjoyment of all things natural made him a critic of excessive specialization, so prevalent today. I remember a remark of his during one of the early international conferences on high energy physics, stating "Any experimentalist, unless proven a damn fool, should be given six months to analyze his own data." This remark was a reaction to the theoretical physicists who then as now tended to jump on very preliminary and incomplete data by conjecturing profound, and sometimes unfounded, implications.

In a real sense SLAC owes its very existence to Ed McMillan. After a recommendation by a joint group drawn from the General Advisory Committee to the Atomic Energy Commission and the President's Science Advisory Committee that SLAC be built, Ed McMillan made a personal presentation to President Eisenhower supporting the construction of the two-mile accelerator, a record-breaking undertaking for

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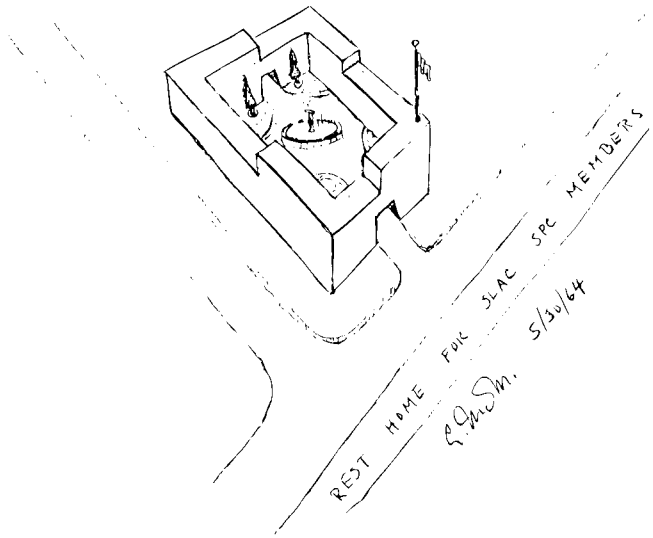


McMillan's concept of the A&E Building, 1964

that time. Eisenhower stated in a press conference in April, 1959: "I am told by the scientists that this is the most extraordinary thing that has yet been attempted and will put us way ahead of where we are now." The spokesman for the scientists quoted was Edwin McMillan. After SLAC became a reality, McMillan maintained his friendship with SLAC, serving on its Scientific and Program Advisory Committees. During the frequently dull sessions of these committees he made doodles depicting skeletons of imaginary fossils or geometrically impossible structures. Those doodles are in my files!

We often "talked shop." My last purely scientific contact with him was when he found an algebraic error in a calculation I had done on the depolarization of electrons in the SLAC electron beam. This is a current topic today, when we hope to see polarized electrons constituting one of the two colliding beams providing events to be analyzed by the SLD.

Edwin McMillan was an unassuming person who enjoyed nature, his friends, and his family. His great contributions seemed to flow effortlessly, incidental to his many other qualities. He was truly unique.

—Pief Panofsky

Welcome New Employees and Guests

Mikhail Avilov, B Factory; **Mark Dubrow,** ES&H; **Moshe Elitzur,** Theory; **Adam Falk,** Theory; **Aleksei Fedotov,** B Factory; **Barbara Johnson,** Personnel; **Steve Levitt,** Control Dept.; **Peiqin Li,** Group C; **Weiguo Li,** Group C; **Mary Litynski,** Housing; **Qi Liu,** Group C; **Werner Meyer,** RD; **Flemming Pedersen,** Accelerator Department; **Yasunori Takeuchi,** Group I; **Glenn Tenney,** Business Services; **Marat Valiev,** B Factory; **Roberto Vega,** Theory.

BENEFIT OFFICE NEWS

AS AN EMPLOYEE of the Stanford Linear Accelerator Center, you have terrific connections in the world of finance. Connections that get you:

- Checking with interest
- Free Automated Teller Machine (ATM) card
- Low-cost VISA card

Banks won't give you these services at such low cost. Only Stanford's own Credit Union will. Stanford Federal Credit Union (SFCU) is a non-profit cooperative financial institution, owned by its 25,000 members, with an elected board of directors. Because every Credit Union member is a co-owner, the Credit Union works harder. The Credit Union has different priorities than banks, and better policies. And with each account federally insured to $100,000, the Credit Union is a safe place for your money.

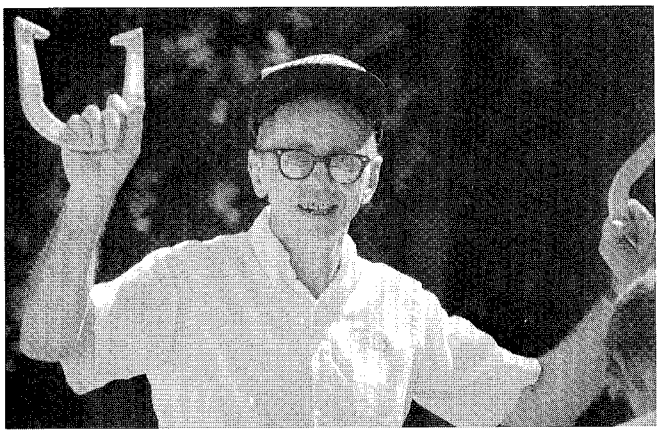
The Credit Union has just about every kind of account, deposit service, and loan you could want. Their checking accounts are fantastic— you earn 4.75% interest and pay no fees if you keep $500 or more in the account. Even if you don't keep the minimum balance, you can still write as many checks as you want for a monthly $4 fee. SFCU makes it easy for you to get cash on campus and throughout the US seven days a week, 24 hours a day. You get a free ATM card with your checking or savings account, and you never pay a fee to use it in any of their five ATMs on Stanford land. And, for a nominal fee, you can make withdrawals at over 20,000 ATMs nationwide.

Near a phone but not an ATM? With SFCU's FasTELL service, you can turn any touch-tone phone into a teller. You can check on your balance, transfer money, even mail yourself a check—all for free. VISA bills within 25 days of the end of your billing period, and the finance rate is only 15% APR.

Like banks, SFCU offers a wide range of loans with flexible terms. But that's where the similarities stop. SFCU isn't profit-driven, so they don't charge high rates or add unnecessary fees to their loans. Instead, their purpose is to serve their member-owners, making loans easier to get and easier to afford. At the Credit Union, every member's satisfaction is guaranteed. If you decide to close your account, they'll promptly refund all normal service fees and the membership fee. Just ask for your refund within 90 days of joining the Credit Union. Stanford Federal Credit Union is the Carrier-of-the-Month in October. If you would like to join the Credit Union or if you have questions, drop by the Auditorium Breezeway from 11:30 AM–1:00 PM, each Wednesday in October.

—Betty Strickland

DICK McCALL'S RETIREMENT LEAVES LARGE VACUUM



Ralph Nelson

DICK MCCALL HAS DECIDED TO LEAVE SLAC to devote his considerable talents to horseshoes, his family, and consulting (making those medical accelerators around the world as safe as he made SLAC when he worked here). That's where he's liable to be found these days, ensconced in his workroom at home, calculator in hand, FAX machine at his elbow, designing the shielding for medical accelerators.

Dick first came to SLAC in 1964, taking over the role of leadership of the Health Physics Group from Marianne Whitehead. At that time, we barely had an accelerator, more like a cut in the earth out by Sand Hill road, with various components still down at the Stanford Campus site (the old M2 building) being tested and making copious amounts of radiation. He came to us with almost no high-energy physics experience but a tremendous amount of experience in nuclear physics, having spent time at Hanford Labs in Washington, and in Sweden where one of his three children was born. His job just prior to SLAC was at ConRad (Controls for Radiation) where he designed their Thermo Luminescent Dosimeter (TLD) system as well as the method of implanting lithium into Teflon for easy handling. (This is still the typical method for most TLDs used for personnel dosimetry today.) We can remember wanting to do an experiment on energy deposition from a 1-GeV electron beam striking a piece of copper, and wondering just what to use as our measurement tool. His TLD experience was just what we needed, and we proceeded to make a measurement that is still considered one of the benchmarks in this area. That was one of his first introductions to high-energy accelerator physics, and we learned in this experiment as much from him as he did from us.

After that, he turned his considerable creative talents to designing ionizing radiation detectors, especially what came to be known as the Oranges, survey meters that lasted for more than 25 years before they were replaced. He was also instrumental in the design of the TLD system that has been used at SLAC ever since (soon to be replaced by an automatic system) as well as setting the design goals for our Beam Shut Off Ion Counters, those lemon-colored cylinders outside almost all shielding walls of end stations and interaction regions, and which not only measure the radiation leaking through the shield, but also shut off the beam if the radiation levels become excessive. Those units, designed in collaboration with Gary Warren and Gordon Babcock (since retired), are still working after almost thirty years, and will probably continue on into the 21st century!

When the Health Physics Group split into two parts in 1976, Dick remained with the research portion, known as Radiation Physics, a much smaller group but one in which there was more time to devote to his main interests, research and development. He worked on projects such as the transport of a few MeV neutrons inside concrete tunnels and rooms, developing a scintillator survey meter to replace the Oranges, and leading the research efforts of the rest of the Radiation Physics group. By this time, he had become recognized nationally and internationally as one of the leaders in high-energy health physics, and especially in the realm of medical accelerator safety. He was invited to work with the NCRP on various groups, and soon was given the honor as a Fellow of the Health Physics Society.

His last years at SLAC were devoted less to research and development and more to interacting with DOE on the various safety issues as they related to accelerators (as opposed to nuclear reactors). His work in this field has done much to prepare us for the impending Tiger Team visit.

We at SLAC will miss his cool hand on the Radiation Safety Committee and his being the Radiation Safety Officer for SLAC. We will also miss his concern for the welfare of his group and the people within it. His door was always open if we ever had a problem. I suspect that if we wanted to avail ourselves of it, we could go on over to his house and would find the door of his office still open. That's just the kind of person he is.

—Ted Jenkins and Ralph Nelson

CALL FOR CARTOONISTS

Like to doodle? Send your work-related cartoons to TIP, MS/68. If they make us laugh, we'll print them.

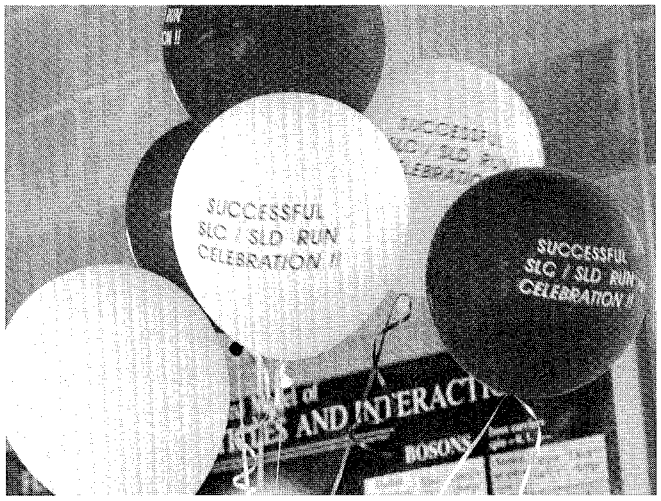
CONGRATULATIONS SLC/SLD!

THAT WAS THE TEXT OF THE LARGE POSTER that greeted members of the SLAC staff as they arrived at a big celebration on Friday afternoon, September 6. What was the celebration all about? Well, there was good news of several different kinds. To begin with, we had just completed a very successful five-month run of the linear collider (SLC) with its new SLAC Large Detector (SLD) in place at the point where the SLC's electron and positron beams interact with each other in the Collider Experimental Hall. As everyone knows, our work with the SLC is aimed toward making it a more productive research instrument by increasing the "luminosity" of the machine—that is, the rate at which it produces interesting events such as the creation and decay of Z^0 particles.

The primary goal for the just-completed run of the SLC was to increase the maximum luminosity by about a factor of four over what had been previously achieved. This goal translated into a desired rate of about 7.5 Z's per hour at a pulse repetition rate of 60 Hz. Additional goals were to produce more than 50 Z's per day, and to have an SLC efficiency or uptime of about 30%.

What was actually achieved during the past run was very encouraging. The peak luminosity was greater than 8 Z's per hour; the per-day production rate was close to and eventually exceeded 100 Z's near the end of the run; and during the final week the SLC uptime was greater than 60%. These are superb achievements. Congratulations to everyone who contributed either directly or indirectly to this effort! (And that means everyone at SLAC.)

In parallel with this work on the SLC, the just-completed run represented the shake-down engineering run for the new SLD detector system. This went very well, with the various subsystems being run in and brought up to speed. During the whole run, the SLC produced an estimated 1500 Z^0 particles, and the SLD was on-line and functioning well enough to actually detect and record some 330 of them. This was an excellent break-in period for the SLD, which should now be in good shape to begin its first all-out physics run at the end of this year.

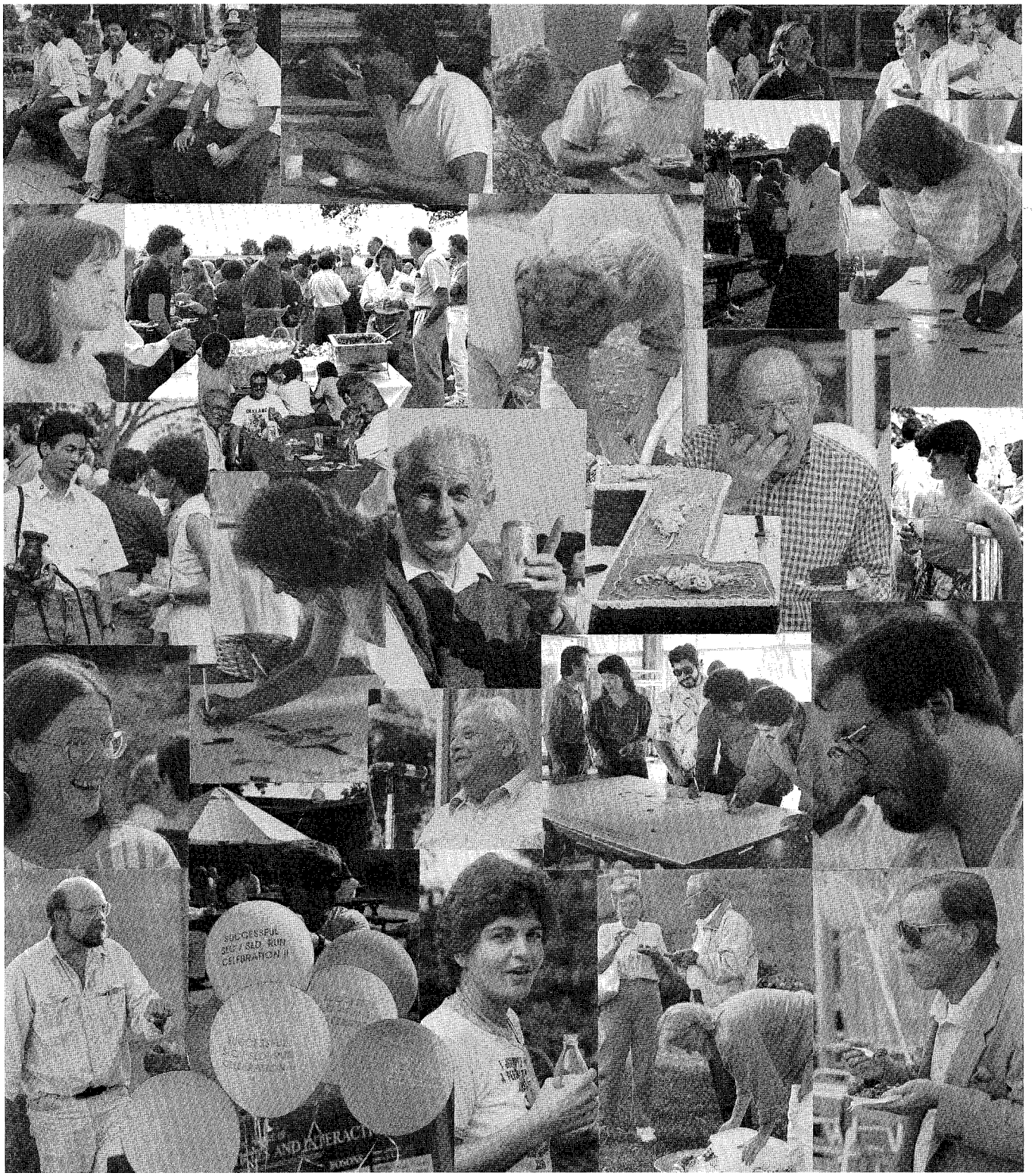


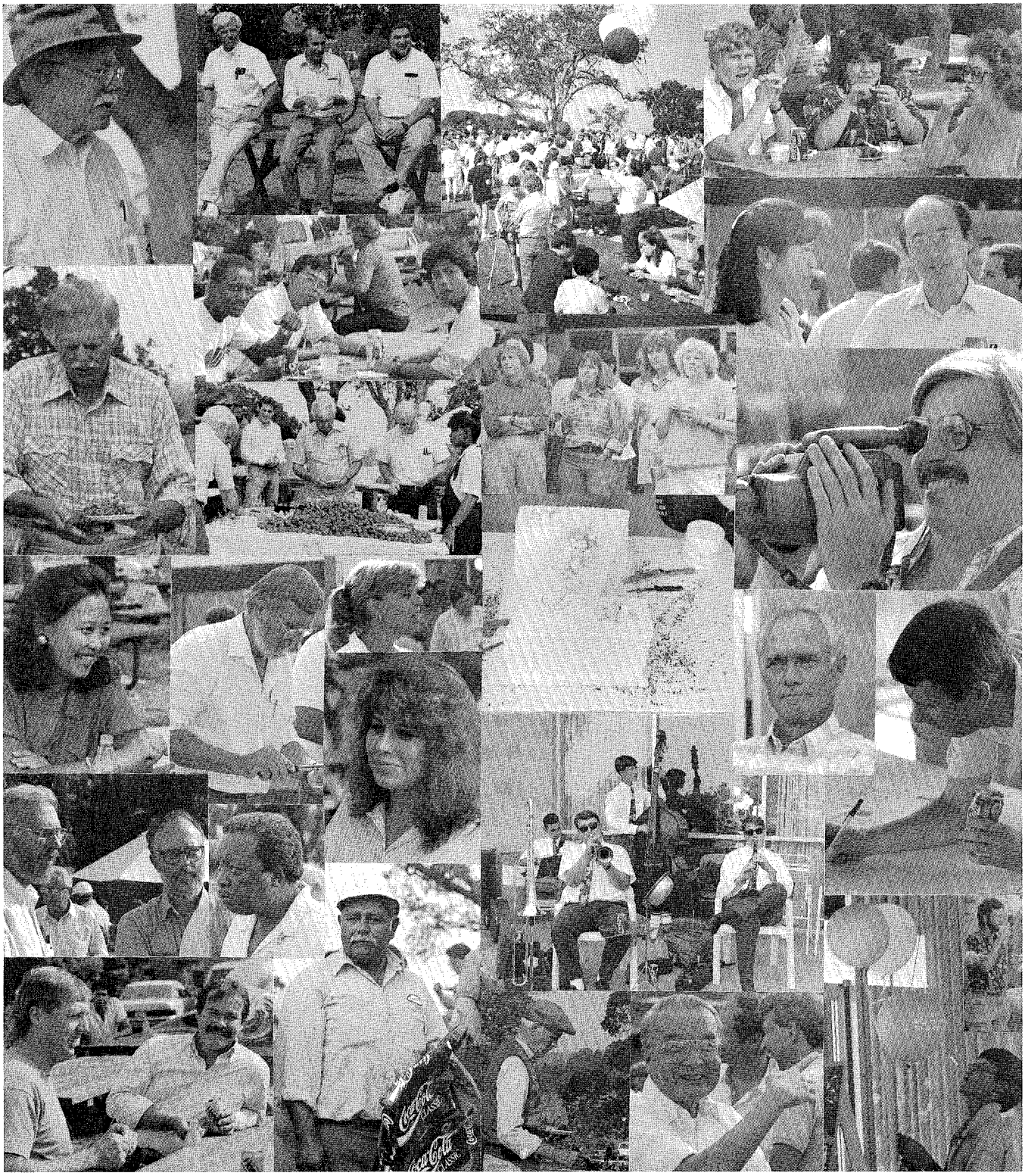
Other good news became evident after the end of the SLC/SLD run when the Accelerator Department switched over to running experiments E140 and NE18 in End Station A, with almost immediate excellent operation. In addition, SSRL reported that the commissioning run of the SPEAR facility with its new synchrotron injector was moving along very well. Good news all round!

With all this accumulation of good news, it seemed obvious that SLAC and SSRL were ready for a joint party. As a result, a site-wide celebration was held on Friday, September 6 in the afternoon, behind the Cafeteria. Even though the party was organized at the last minute, the committee that threw it together did a terrific job. Consisting of Barbara Barrera, Maura Chatwell, Andrea Higashi, Robbin Nixon, Joyce Pelzl and Lilian Vassilian, the group managed to get decorations, food, drinks, and music ready in the nick of time. Sylvia MacBride made a large poster board of the SLC/SLD complex, and everybody at the party was encouraged to sign his or her name around the sketch to preserve this event for posterity.

All in all, it was a happy and cheerful celebration, well deserved by everybody. Too bad a few hard-working people on shift or on vacation could not be present. If you missed it, be sure to get your signature on the poster, in the Main Control Center.

—David Leith, Greg Loew, Bill Kirk





GERMAN SCHOOL OFFERS MULTICULTURAL EXPERIENCE

SLAC, LIKE THE WORLD of high energy physics, is marked by a community that has become progressively more multicultural. With research projects taking on the shape of international collaborations, many physicists join SLAC from other countries. Whether they stay for a few years or permanently, for those who have children the question naturally arises, how to raise their offspring not only bilingually but also with an appreciation of their diverse cultural heritages.

For Allen Odian, Rainer Pitthan, Helmut Walz, all of SLAC, the answer has been to send their children to the German School of the Mid-Peninsula in Redwood City. The school meets on Saturday mornings only, with classes from kindergarten to the junior high level. The classes provide the children with a cultural framework that includes both German language lessons and central European history and geography.

Helmut Walz originally moved to the US to complete his university studies and has remained here since. Both he and his wife are German and speak German with their son and daughter at home. Sending the children to the German School helps to maintain and improve the children's language skills outside of the home and also allows them to make friends with other German-speaking children. Helmut feels that in order to communicate effectively with his children he needs to share a common background with them. In addition, all of the couple's relatives still live in Germany, so speaking German is essential for the children to stay in touch with their extended family.

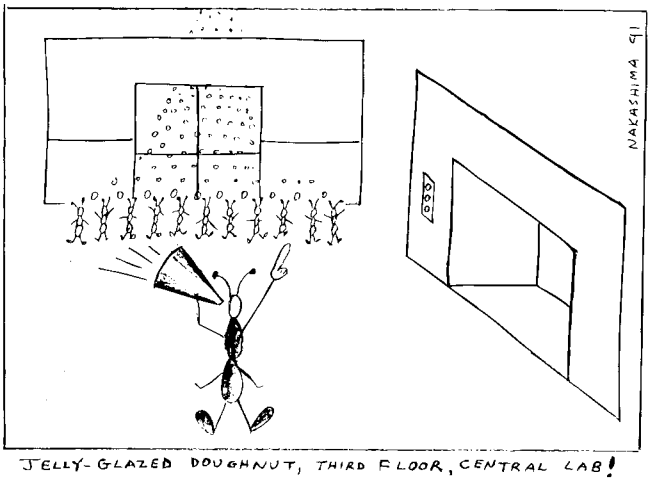
Allen Odian grew up speaking Armenian and English, and later added Italian and German to his repertoire. Having a multilingual background himself, he is aware of the advantages of a multicultural upbringing. Allen feels that learning another language and culture changes one's way of thinking and broadens one's perspective, as the overlap of two cultural frameworks inevitably creates a multiplicity of viewpoints. Allen's wife is German, and although they speak German at meals, Allen speaks English and his wife German with the children at other times. Both of their sons have attended the German School since they were four. His oldest son just graduated from the school, and during a recent six month stay in Germany, integrated effortlessly into a 7th grade class there.

Rainer Pitthan, now on sabbatical leave at CERN, was the school board president for a year. The school, founded in 1966, is a non-profit, parent-run corperation which relies on the initiative and participation of the parents. Aside from Saturday classes, the school also offers adult and teen beginner classes, and advanced college placement (AP) test preparation courses. The percentage of children enrolled who do not speak German at home has been increasing over the years. A Chinese family is now sending their child to the German School, and Allen Odian pointed out that the school has been adapting its teaching techniques to serve children with and without a German background.

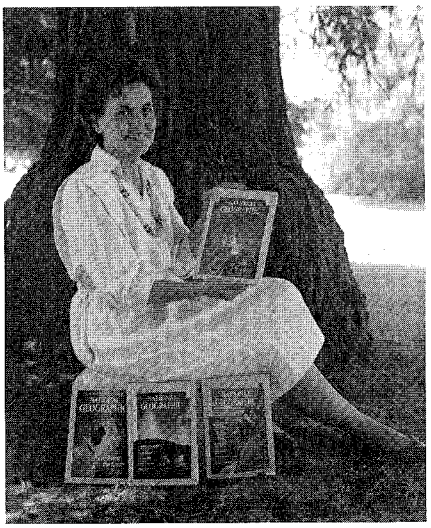
Clockwise from upper left, Erika Odian (librarian), Monika Bal (principal), Martin Odian, Stefanie Walz.

In a world in which almost all interaction takes place on a more and more international level, growing up bilingually is a definite advantage. The German School of the Mid-Peninsula offers children an opportunity to grow up speaking two languages and to grow in more than one cultural heritage. For information about the school call (415) 341-3392. —*Annette Cords*

Major Ant Deploys Troops



GEOGRAPHIC CAPER



BOXES OF *National Geographic* magazines dating back to the 1940s were sent on their way to the Philippines recently—thanks to two well-known SLACers, Eunice Butera and Richard Early. Eunice, who provided relief nursing care for seven years at SLAC, stopped at Mercy Center in Burlingame and noticed that a teacher had posted a note on the bulletin board requesting specific magazines that would be sent by boat to Manila to be used in schools. Apparently the *National Geographic* has been unavailable in the Philippines. In a casual conversation soon after with Richard Early, whose Theory and Special Projects Department office is near Medical, Eunice learned that he had such a collection and was preparing to dispose of it. The magazines quickly changed hands, and are no doubt in the Philippines by now.

Many of you may not know that Eunice left SLAC in August. She now lives in Tucson where she works in an urgent care center. Her presence in the Medical Department is already missed. Good luck in your new ventures, Eunice!

—Marion B. Lisotto

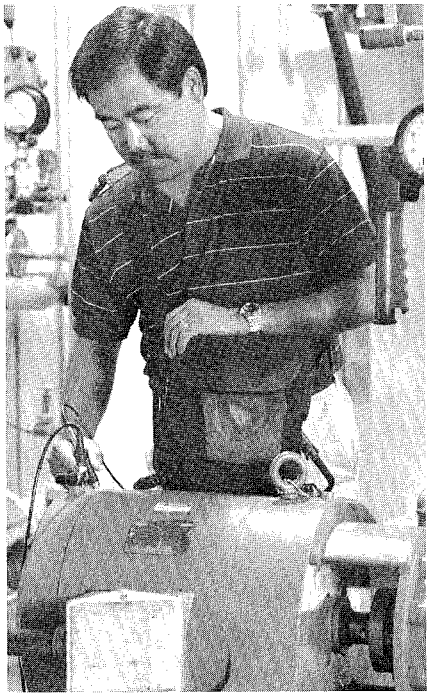
NEW TOOL USED TO PREDICT MAINTENANCE NEEDS

BORROWING FROM technology developed for the US Navy, the Plant Engineering Department is now applying a new form of predictive maintenance. The new technology is designed for situations where the reliability of many pieces of equipment is highly critical, but the number of staff available is limited.

The Navy utilizes a form of artificial intelligence (AI) to diagnose the condition of machinery used aboard ships. The system uses vibration data to analyze the condition of machinery with moving parts. The vibration data is fed into a portable PC equipped with a probe which can be attached to the equipment being measured. The software segregates the measurements into separate vibration spectra specific to each piece of equipment. Subsequent review of the spectra can reveal problems of imbalance, impending bearing failures, and misalignment. By recording a machine's previous spectra, a pattern of individual machine conditions can be tracked, enabling prediction of probable future failure and preventative action can be taken.

This new technology is being tested at SLAC by monitoring a sampling of 50 of the more than 200 water pumps and other types of rotating machinery suitable for vibration analysis. Vibration data from the sampling has been incorporated into a database to develop a vibration signature for each machine. This database establishes a base line from which to gauge deviations in the future that could successfully predict equipment failures before they occur, allowing Plant Engineering to alert operations and plan for the maintenance. Programming of the system was accomplished by Ken Page, a summer student from Cal Poly. Ken worked closely with the manufacturer of the vibration analyzers to customize the system for application at SLAC.

—Harry Shin



Harry Shin testing the vibration on a piece of equipment.

COLLEGE BOUND

Tuition Grant Program applications have arrived for the new school year. Children of eligible employees will be attending the following colleges: Stanford (4); UC Berkeley (2), UCLA, UCSD, UCSC (3) UCD (4) UCSB; California State: San Jose (6), Hayward (3), San Francisco (4), San Diego, Fullerton, Northridge; Occidental (2); USF (3); Miami; BYU (2); LMU; Northwestern; Oregon; DePauw; Western State; Reed; Portland; Bowdoin; Evergreen State; Westmont (2); Harvard-Radcliffe; Oregon State; Howard (3); California College of Arts & Crafts; Washington; Menlo; Santa Clara (3); Yale; Calvin; Weber St; Lewis & Clark; Dallas Baptist; Junior Colleges and Vocational Schools (10). For more information about this program contact the Benefits Office, ext. 2357. *—Marie Arnold*

EVENT CALENDAR: OCTOBER–NOVEMBER 1991

All meetings are held in the Orange Room, unless another location is listed. Please notify the Public Affairs Office of any additions or changes by calling ext. 2204 or sending e-mail to nina@slacvm.

October 1, Noon
Origami Class (easy)
Tatsu Takeuchi
(Green Room)

October 3, Noon
Origami Class
(more difficult)
Tatsu Takeuchi
(Green Room)

October 4, 11 AM
Tiger Team
Escort Training

October 7–November 6
Tiger Team Comes
to SLAC (Bldg. 28)

November 1, 9 AM
SLUO Executive
Committee Meeting
(SCS Conf. Room)

November 7–8
SSRL Users Meeting
Bienenstoick, Robinson,
Cantwell (Auditorium)

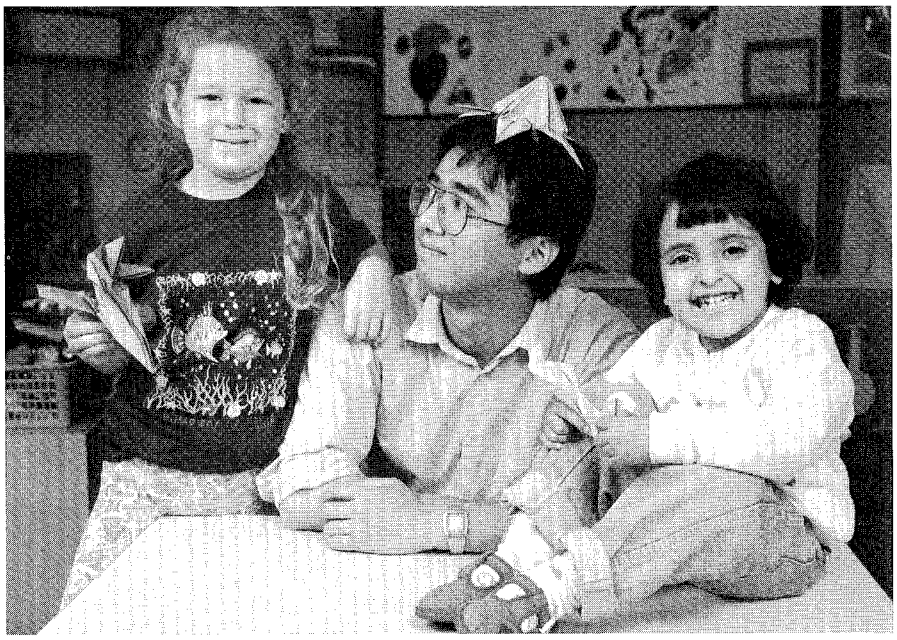
November 7, Noon
20th Annual SLAC Run
(Accelerator)

November 22–23
SPC Meeting

October 22, Noon
Women's Interchange
at SLAC, SLAC Human
Resources, Organiza-
tion, Philosophy,
Interaction
Lee Lyon (Auditorium)

The Interaction Point is published by Information Services of Stanford Linear Accelerator Center. Editors: Evelyn Eldridge-Diaz and Bill Kirk. Summer Intern, Annette Cords. Photographer: Tom Nakashima. Cover and Z art, Sylvia MacBride. Deadline for articles is the first of every month. Submissions may be sent on SLACVM to TIP or by SLAC mail to TIP, MS 68. Phone 926-4128.

ORIGAMI MANIA CONTINUES...



Shin'ichi, center, with friends Lindsey Thomson-Levine, left, and Sara Al-Khalid.

WE IN THEORY WERE DELIGHTED to host origami master Shin'ichi Nojiri and his lovely wife Mihoko Nojiri, both theoretical physicists from Japan. They came to do research, but Shin'ichi was continually beseeched with, "Shin'ichi, would you please make a cat?" "Oh, I want one of those too." "Would you make a big lizard?" "Could you find time to have your picture taken?" "While you're having your picture taken, wouldn't it be a fabulous idea to do it at the Children's Center of the Stanford Community? It would make a really great picture. Oh, and as long as you're there, why don't you show the children some origami?"

When Shin'ichi found himself surrounded by four-year-olds at the Stanford Children's Center, he seemed to enjoy himself. A four-year-old's version of English may not match the Japanese version of English, but they communicate better than adults. They liked Shin'ichi and leaned into him and gave him their special knowing looks; Shin'ichi felt right at home.

During his visit at SLAC, Shin'ichi took a seven-hour train ride to Santa Barbara. He used the time to work on his stegosaurus, a variety of dinosaur. He was so focused on the stegosaurus that he didn't notice the children gathering around him. He looked up suddenly to see several little people hungrily eyeing his stegosaurus. He quickly began folding easy-to-make creatures for the children, while trying to hold onto his stegosaurus. Shin'ichi mass-produced origami for seven hours, but the little people kept arriving, and in the end, he even lost his stegosaurus. —*Elea Drake*

AND CONTINUES...

TATSU TAKEUCHI WILL TEACH TWO CLASSES on how to make origami spheres (stellar icosahedrons) on October 1 (easy) and October 3 (more difficult) at 12 noon in the Green Room. These beautiful spheres would make perfect Christmas decorations and gifts. There is a $3.25 charge per class to cover the cost of the paper. If you wish to attend, please respond to Elea Drake at ext. 2266, or e-mail theory@slacvm. Please respond by September 27. —*Elea Drake*

19th Annual SSI Hosts International Audience

SUMMER SOCCER INSTITUTE

Roberto Strioli

Standing from left to right: Dave Coward, Giulio D'Agostini, Andrei Dake, Wolfgang Lorenzon, Richard Milner, Michele Gallinaro, Makis Petratos, Paul Makkar, Steve Gibbons, Reinhold Seifert, Cesare Bini (The Coach). Sitting from left to right: Philippe Pierre Schune, Paul de Jong, unidentified, Reino Keranen, Michael Spengos, Walid Majid, Cho-Kuen Ng, Rad Antonov.

AT SLAC WE HAVE A TRADITION OF PLAYING SOCCER every Friday of every week which comes during the year, sunshine or rain, it doesn't matter what the weather conditions are. Everybody knows that there is little chance to have something different from the first item on the list to come. It is probably a matter of geological, natural, intrinsic life of this part of the bay. During the last SLAC Summer Institute, one big event took place which lightened the whole school. We decided to have a real match on a real soccer field, with real posts and even real white sidelines. We then recruited a team from the folks at the SSI and we had a great game: SLAC vs The Rest Of The World (TROTW).

Of course, no chances were offered to the other team to win, so that we had the lead and kept it to the end. The score was close throughout the game and it was always open to surprises for the winning team. Steve Gibbons gave a great performance, scoring three goals for the SLAC team, which thanks him for being at the right place at the right time. Unfortunately, it wasn't the same for the other team's goalie. Cesare, the TROTW coach, was standing on the border of the field, meditating on the flowers and the birds, still confident his team would win, even though in the second half the score widened in favour of the SLAC team.

The final score? That is not important since the main reason we play soccer is to have fun. The team collaboration is worth more than fighting for the score. This, of course, does not mean that the number of goals one team is able to add to its pocket is not important. We just don't want that to take over the fun part of the game. For the Funless Guys, the outstanding victory of the SLAC team was 6 to 3.

When the game was over, the beer came out. This was not at SLAC and it didn't happen during working hours.

We would like to thank Christie Dunwoodie for the great success of the event. She organized the game, but could not participate because of work problems and of a dinner which was set for the wrong time.

—Michele Gallinaro

SUMMER INSTITUTE 1991

THOUGHTS OF SUMMER at SLAC should bring to mind the Summer Institute (SSI), and this year we did it again! Representing ten countries, 243 graduate students, post-docs, staff physicists, and faculty members convened at SLAC from August 5–16. With this year's theme being Lepton-Hadron Scattering, SLAC's newest Nobel Prize winner, Richard Taylor, started the proceedings with an historical discussion of electron scattering. Subsequently, speakers from Columbia University, DESY, Penn, UCLA, and SLAC took the physicists through a history of particle physics. The topical conference, held during the final three days, culminated the retrospective presentations with current data from various research underway at CERN, BNL, FermiLab, Cornell, LBL, Carnegie-Mellon, University of Rochester, and McGill University.

Not every activity was as serious as the talks. Social hours and dinners continued the discussions, but when the music began, the topics changed to travel, food, and sports. Some of the attendees even managed to work in a game of soccer!

Each attendee learned something new before SSI was over. For some, it may have been an entire topic, for others, it may have only been attaching a face with a person's name. Whatever the outcome, the nineteenth annual SSI was unique (including the August rain!) and next year SSI can promise again to be distinctive!

—Jane Hawthorne