

Tristan Makes BNL Debut

Tristan is alive and well, and on-line at the High Flux Beam Reactor. So reports Bob Chrien, head of the Neutron Nuclear Physics Group, on the reconstructed mass separator which was transferred from the Ames Laboratory two years ago.

Tristan is used for the study of unstable nuclides, rich in neutrons, which are produced by fission, and, otherwise not found in nature.

A successful development run was concluded early in July and, according to Chrien, "if I can believe what's coming out now, we are probably better by a factor of 100 in terms of intensity and activities than any other similar facility." Although Tristan is the only reactor-based, on-line mass separator in the United States, comparable facilities are at Studsvik, Sweden and Grenoble, France.

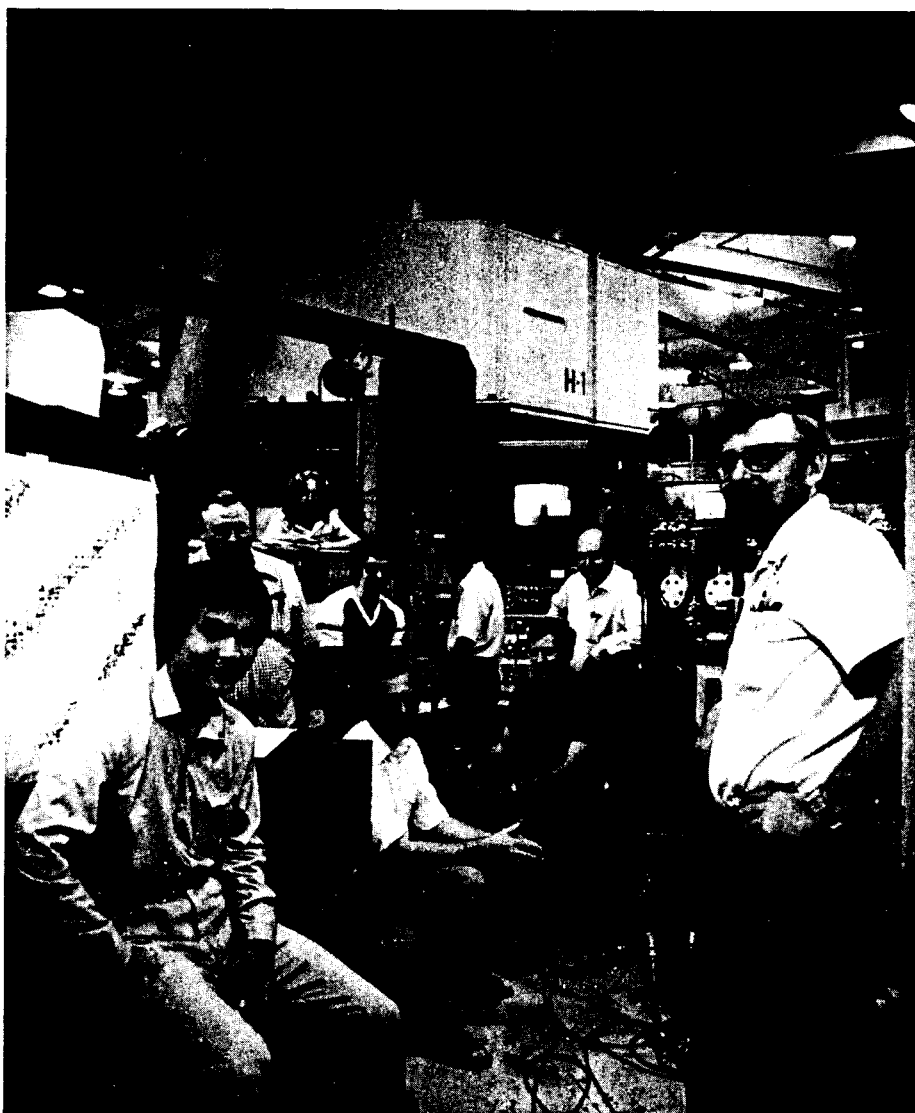
Tristan was in operation at Ames for 12 years, and after the shutdown of the reactor there, was moved to Brookhaven in May 1978. The transfer was negotiated by DOE's Division of Basic Energy Sciences. Since that time, it has undergone many modifications and improvements. The installation of the complex apparatus at the beam line took a year, and another year was spent developing the all-important ion source.

Mass separators can be put either at a reactor or an accelerator. Both provide a beam of particles - in the former case, neutrons, and the latter, protons - that break up the nuclei and produce the isotopes.

At the HFBR's H-2 beam line, a U-235 target is placed in a neutron beam and undergoes fission, resulting in a vast assortment of fission fragments. These fragments are ionized in the plasma discharge of the source, and accelerated through 60 kilovolts in this device. They are then swept into a magnetic field and separated according to mass through a slit in the focal plane of a 90° magnet. By means of a beam switching magnet, the resulting particles are sprayed on a mylar tape which is moved past various solid state radiation detectors.

From the analysis of beta and gamma radiation, scientists get a picture of the structure of these nuclei. Other principal experiments at Tristan will include the study of delayed neutron emission, and measurement of nuclear masses.

The basic research done at BNL



The Tristan team at the HFBR's H-2 beam line (from left) Chien Chung, Warner Hayes, Dean McDonald, Ron Gill, Kornelius Sistemich, H.I. Liou, Daeg Brenner, Bob Chrien, Marion Stelts. Not present for the photo were Fred Paffrath, Moshe Shmid and Greg Gowdy.

will be useful in the design of reactors. For instance, how reactors cool down after shutdown depends on the decay of fission fragments. Of course, a great deal of work has been done on this, but Chrien says details on which fission fragments produce the heat, and how the decay occurs in time, are still not fully understood.

Ron Gill, who received his Ph.D. from Iowa State, and spent several years working at the Ames Tristan, was primarily responsible for installation at the beam line, and contributed to the development of the ion source. Another developer of the source was Moshe Shmid, a visiting physicist from Israel. They were aided by technical specialist Warner Hayes. Physicist Marion Stelts played an important part in the evolution of the computerized data acquisition

system, along with programmer Horng-ing Liou and engineer Vito Manzella. Fred Paffrath and Dean McDonald, technical members of the Neutron-Nuclear Physics Group, also work on the project, as do post-docs Chien Chung and Greg Gowdy.

So far, Chrien says, about 60 scientists from universities and other laboratories have expressed interest in doing experiments here. A number of potential users have already spent time at Brookhaven collaborating with the BNL staff on the creation of Tristan II. The Users' Group is chaired by Daeg Brenner of Clark University.

The August reactor cycle at the HFBR will be devoted also to Tristan development, and Chrien says, "now we should be ready to complete some significant experiments in that cycle."

Two Facets Of Fruitful Research

Most people think of fruit flies as a mild annoyance they have to put up with if they like to have bowls of fresh fruit around. But to many biologists, fruit flies, or *Drosophila*, are valued research tools.

They don't take up much space, and they're cheap and easy to breed. They take just ten days to develop from eggs to adult. Fruit fly test systems have been used for years and have provided quick and reliable answers to all kinds of scientific musings.

Purushottam Kale, a scientist with the Safety and Environmental Protection Division, uses fruit flies to evaluate genetic effects of exposure to various environmental conditions.

What Do Fruit Flies Have In Common With People?

You might not think so, but biologically speaking, fruit flies are in the same class as humans. We are both eukaryotes - a term for higher organisms that have rigidly structured chromosomes.

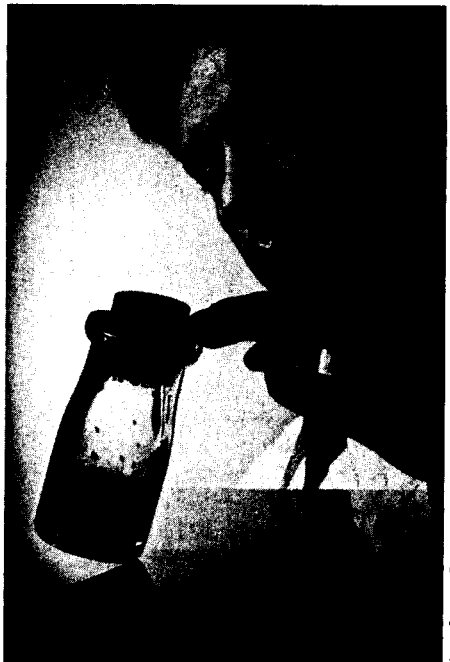
Fruit fly DNA is similar to human DNA. So genetic studies using fruit flies can have meaning for humans.

Exposure To Magnetic Fields

One of Kale's projects, funded by DOE, uses fruit flies to evaluate genetic effects of high magnetic fields.

We live every day, with no obvious ill effect, in the earth's magnetic field of 0.5 Gauss (G). Why study high levels of magnetism?

Fusion reactors may be part of our energy future. High strength magnets, probably with fields up to



Purushottam Kale breeds half a million fruit flies a year for his research on genetic effects of high magnetic fields and chemical pollutants.

100,000 G, will be used to contain plasma a fourth state of matter - hot, ionized gas) in a fusion reactor. Even with shielding, reactor workers may be exposed to a residual magnetic field.

Kale has exposed fruit flies to magnetic fields ranging from 13,000 to 37,000 G. For the lower end of the range, he uses a small magnet in an office adjacent to his. For the higher levels, he uses superconducting magnets at the AGS.

The encouraging news is that after two years of testing, Kale has found they suffer no genetic damage. But the project isn't over. Next, he will experiment with the synergistic (combined) effects of high magnetic fields

(Continued on page 2)



Why is this man smiling? See page 3.

Weekend Tour

The Brookhaven House, an innovative energy-efficient home currently being constructed at the Lab, will be featured in this weekend's tour. The design of the house combines a number of energy-related concepts, including the use of passive solar energy and natural thermal storage. Visitors will be able to see the house and talk to architects about the different design elements that result in dramatic energy savings.

The complete tour of the Lab also includes a viewing of Brookhaven's "Quest," a guided bus tour of the site, and a visit to the Exhibit center.

A Spokesman's View



James Kent - "Famous World War I Flying Ace"

Ed. note: The Bulletin's summer student, James Kent, recently participated in a 14-mile bicycle race in Newburyport, Massachusetts. Under threat of having his bottle of white-out confiscated, he was persuaded to file this report.

During a practice lap around the circuit, I had run over some very moist gum and was still trying to unstick the mess from the rear brake when the starter waved his arm and called "All seniors. . . please form three lines across the street. . . lines of five please. . ."

I hustled onto my bike, bubble gum and all, and swung into line. The other riders were talking nervously with each other, taking their last slow sips of water. The sun was like a hundred suns and the road ahead shimmered. "Here," I mused, strapping on my helmet and adjusting my sunglasses, "is the Famous World War I Flying Ace, chatting calmly with his ground crew before another dawn patrol. Death lurks ahead. . ."

While the starter recited Robert's Rules of the Road ("And no passing in the turns. It's very dangerous.") I took stock of my competition. Although it doesn't tell all, equipment tells lots. At least who has money - or had money.

The row of bikes off my bow included a few Sears Special Racers: no problem. There were also a couple of Raleighs: could be problems. To my stern, a few French makes: could be sleepers. And there off my starboard stern was a green machine with no markings: a definite problem. Premium bicycles exude understatement. One small decal, no pinstriping, no chrome. This bike was built for speed.

The bike's rider was also suspect. He had blond hair and grossly over-trained legs. He had blue eyes and fit perfectly what I imagined Hermann Goering's aide-de-camp looked like. I nicknamed him Hermann Goering and decided he was The Enemy.

Half apologizing for the heat, half asking if we really wanted to do this, the starter said "Go. . .?" and we shoved off.

The race is staged on a 7/8 mile circuit around the "Pond at the Mall." The tight loop offers two long straight-aways, one wall and three hair-pin turns. Townspeople crowd along the curbs and shout encouragement, obscenities and occasionally squirt water.

The clump of riders had quickly strung out into a long thin line down the road, with the eager and inexperienced ones racing up the flanks toward the front of the pack. Always eager and usually inexperienced, I

sprinted forward and found Hermann leading a few Sears Racers.

One by one, I edged out the Sears contingent and got behind Hermann, cruising easily in his draft. He looked back. I smiled and waved. He swung from side to side; I swung from side to side. He picked up the pace and a few of us, closely packed behind Hermann, broke away from the group and formed a lead pack.

As the race pounded on, the lead group shrunk to three riders: Hermann in front, someone who looked like Valery Giscard d'Estaing second and me third. A pace motorcycle kept a few dozen yards in front of us, properly apportioning each rider his Minimum Daily Recommended Allowance of carbon monoxide and other noxious fumes.

By the rules of the race, any riders lapped by the motorcycle had to drop out. By lap 12, the field was cleared down to ten of the original 15.

On the 15th lap, Goering switched on his booster rockets and disappeared over the hill into hyperspace. Since I immediately lost the benefit of his stern wave, I fell behind quickly but was still significant seconds ahead of the other riders.

By lap 18, Valery and I, by trading off the lead and breaking each other's wind, managed to enter Goering's space-time warp. Sensing danger, he shifted to a higher gear and the pace lifted to 28 mph.

All the preceding laps I had managed to save my strength by drafting behind the lead rider, and taking the front only when urged to by other riders. Now, I thought, in the final lap, I'll cash in my savings.

While I pondered the management of my energy budget, Hermann and Valery began jockeying Kamikaze-style for the optimum sprint position. The final stretch approached. I was in the wrong place. I was behind Valery, who was behind Hermann. The tape was just after a turn, so the rider order entering the turn would be the rider order crossing the tape.

Lacking the killer instinct, I made my last sprint attack too late, and was unable to pass Valery, who had the unfair advantage of a Gaulish, aerodynamically sleek nose. But the finish line is for effort, so I crushed all my life into the toe straps and hoped a sniper would bring down Goering before the finish. But it wasn't to be. We crossed the tape in order of our strategic intelligence, Hermann first (32 minutes, 1 second), Valery (32:3 and me (32:4).

PINY/BNL Courses

Final registration for the PINY/BNL extension courses in nuclear engineering will be held from 6 to 7 p.m., Tuesday, September 9 in the conference room of Bldg. 318 (across from the bank). PINY courses to be offered at BNL this semester are: NU 606-Principles of Radiation Protection, and NU 712-Radiation Shielding. Days, times, and instructors will be announced later.

Professor John Lamarsh, Head of the PINY Nuclear Engineering Department will be here during registration to advise prospective students. These courses are available to BNL employees under the tuition refund policy. They are also open to guests and collaborators, and to a limited number of persons not affiliated with the Laboratory.

Singers In Concert

Helen Wilkinson mezzo-soprano and Elisabeth Palmedo, soprano, will give a diverse musical concert at Berkner Hall on Wednesday, August 13 at 8:30 p. m. Their program includes music by Brahms, Dvořák, Fauré, Mendelssohn and Purcell, as well as Irish and Italian folk songs.

Wilkinson, who studied at the University of Stellenbosch in South Africa, has concertized in that country, as well as in Sweden, England and the U.S. Recently she recorded a program of lieder to be presented on the BBC, and is preparing a series of concerts with organist and conductor, John Birch.

Palmedo, who is well known to BNL audiences, graduated from the New England Conservatory and made



Helen Wilkinson

Elisabeth Palmedo

her debut at Carnegie Recital Hall in 1976. She specializes in chamber music and is a founding member of the North Shore Pro Musica.

The singers will be accompanied by pianist Bea Satz, a graduate of the Curtis Institute who has accompanied many famous singers at the Metropolitan and New York City Operas.

A contribution of \$3 is suggested.

Tati Is Back

It is becoming a tradition for *Le Cercle Français de BNL* to present a Jacques Tati film during the summer. "Playtime" and "Mr. Hulot's Holiday" were shown in 1978 and 1979, and this year the series will continue with "Traffic." The film will be screened in Berkner Hall at 8 p.m. on Tuesday, August 12.

Those familiar with Tati's acting and directing will have no difficulty in recognizing the master's touch. This time Mr. Hulot is a zany inventor attempting to deliver his latest masterpiece, a gadget-laden camper, to the Amsterdam International Motor Show. His trip is beset by the obstacles of international bureaucracy. As usual in a Tati film, a lot of social commentary lurks beneath the surface comedy. "Traffic," released in 1971, was selected as one of the Ten Best of the Year by Vincent Canby of *The New York Times*.

Non-members of The French Group of BNL will be asked for a donation of \$2 (\$1 for students). Refreshments will be served after the film.

Retirees



William E. Rembt

Milton Steinberg

William E. Rembt, Heavy Equipment Mechanic Operator in the Plant Engineering Division, retires today after 18 years with the Lab. He and his wife are taking a trip to Hawaii this year. After that, they'll travel around visiting grandchildren.

Milton Steinberg retired August 1 from his position as Master Welder in the Central Shops Division. He had been with Brookhaven since 1966. Steinberg hasn't made any definite retirement plans. He says he's going to take it day by day.

Woman In Science

The next business meeting will be on Tuesday, August 12 at noon in Room A, Berkner Hall. Nominations for officers will be announced, and elections will be held at the September meeting.

BNL summer students are extended a special invitation. They will meet women in science at the Lab, and learn about the aims and accomplishments of the group.

Fruit Flies

(Cont'd)

and low level radiation.

Exposure To Chemical Pollution

Another of Kale's fruit fly projects, this one funded by EPA, looks at genetic effects of chemicals in ambient air. Fruit flies have been used before to test for mutagenic effects of certain chemicals mixed in food. But those experiments were done with chemical concentrations several thousand times greater than what is normally found at polluted sites. Kale wanted to know if fruit flies were suitable for detecting low concentrations.

Using a test chemical, ethylene dibromide (DBE), a common pesticide soon to be banned by EPA, he exposed fruit flies to concentrations as low as 0.2 parts per million in air. Recessive lethal mutations were induced even at these low concentrations.

"Now we know," says Kale, "that fruit fly test systems can readily be used to monitor gaseous mutagens in ambient air at polluted sites."

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to the city on Wednesday, August 20. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare is \$3.25, children under six years ride free.

Reserve a ticket by sending your fare through the U.S. mail to P.O. Box 322, Upton, New York 11973, no later than Thursday, August 14. Make checks payable to "Brookhaven National Laboratory." Your tickets will be given to you on the train. Refunds will be made only if cancellations are received by the Friday preceding the scheduled trip.

Selected Reading

Science 209 (4453), July 1, 1980
Organic farming becomes "legitimate". L.J. Carter. 254-6
U.S. News & World Report. LXXXIX (2), July 14, 1980
New products to make summertime easier. 61-2
Sci. Am. 243 (1), July 1980
Megalithic monuments. G. Daniel. 78-81 +
Time 115 (25), June 23, 1980
Issue the U.S.S.R. Special Issue. 20-88

Lecture Reminder

Vera Kistiakowsky, Professor of Physics at M.I.T., is the next speaker in the Women in Science Lecture Series. She will talk on "High Energy Interactions - An Emerging Understanding" on Thursday, August 14, at 3:30 p. m. in the Physics seminar room, Bldg. 510.

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Medical Film

A film describing the Marshall Islands project that began in 1954 will be shown Monday, August 11 at 7:30 p.m. in the large conference room of the Medical Department. Interested students and other BNL employees are invited to see the movie, entitled "Thyroid Disease as a Late Sequela of Radioactive Fallout."

Softball

League I

Rained Out

League II

AMD 10 - Roga 3
Moles 14 - Titans 10
Cardinals - Dirty Sox
(Rained Out)

League III

Nuke Powers 14 - Binary Bombers 6
Medical 12 - Brewmasters 4
Ice Pops 10 - Lights Out 7
Huff & Puff 18 - Big Sticks 17

League IV

Diamond 16 - Nads 14
Jim Griffin was 5 for 5. Good hitting by Dot Lundgren who was 2 for 3 with a stand-up double and a single.

Survivors 9 - Thrids 7

E-Z Riders 23 - Turkeys 5

Grand slam by Doug Gillette. Larry Musso was 5 for 5. Gary Goldstein and Dennis Hall were 4 for 5.

Balls & Strikes 14 - Random Sample 8

League V

Mudville Sluggers 9 - TNT 6

In a come-from-behind upset victory, the Mudville Sluggers defeated the TNT's by a score of 9 to 6.

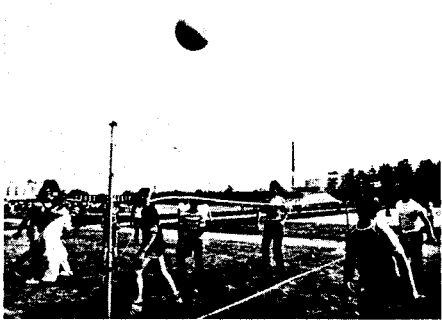
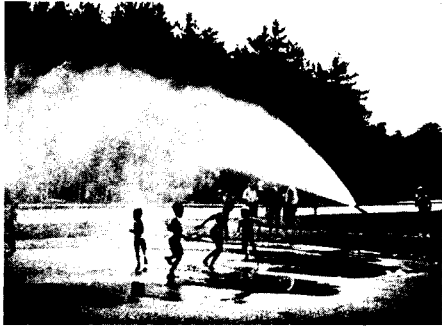
Who Cares 13 - No Feedback 11

No Names 14 - Who's On First 8

Source III 11 - Underalls 8

Makeup game:

No Names 7 - Who Cares 6



Outing '80



Ed McFadden is smiling because he was at the last picnic in '74. He had such a great time that he already has a ticket to the one on August 23, from 1 - 8 p.m. He's not going to miss out on the freebies, parade, dance contest, and . . . games and activities like tennis, softball, volleyball, badminton, ping pong, horseshoes, bicycle races, running races, and . . . performances by a drill team and a bagpipe band, and . . . demonstrations of karate, fly tying, and model airplane flying, and . . . special tours of the Exhibit Center, 10 a.m. to 2 p.m.

Don't wait until the last day of sale, August 15, to buy your tickets. Do it today, and make planning easier for the picnic committee. Tickets are on sale from department secretaries and receptionists. If they haven't come around to you, go to them.

Cafeteria Menu

Week Ending August 15, 1980

Monday, August 11	
Potato leek soup	(cup) .45
	(bowl) .55
Roasted turkey & stuffing w/ cranberry sauce	1.55
Western omelete & 1 veg.	1.40
Hot Deli - Roast beef	(on bread) 1.55
	(on roll) 1.65
Tuesday, August 12	
Split pea soup	(cup) .45
	(bowl) .55
Chinese pepper steak on rice	1.50
Poached fresh fillet & 1 veg.	1.45
Hot Deli - Pastrami	(on bread) 1.45
	(on roll) 1.55
Wednesday, August 13	
Cream of spinach	(cup) .45
	(bowl) .55
Stuffed pepper w/spaghetti	1.45
Pork butt steak w/mushroom sauce	1.55
Hot Deli - 8 ft. Hero	.75 per inch
Thursday, August 14	
Lima bean soup	(cup) .45
	(bowl) .55
Meat cakes & buttered noodles	1.45
Scalloped ham & potatoes	1.40
Hot Deli - Monte Cristo sandwich	1.45
Friday, August 15	
Fish chowder	(cup) .45
	(bowl) .55
Barbecued spare ribs & 1 veg.	1.55
Seafood platter w/french fries	1.87
Hot Deli - Sausage, egg and pepper hero	1.45

Children's Program

Pool Special

Everyone went home happy from last Friday's Pool Special which featured relay races. Winners were: (Ages 4, 5, 6) 1st - Kathleen Holden, Richard Melucci, Rachel Tanguay, Alex Crabb; 2nd - Derek Spark, Daniel Gutlich, Shigehiko Eto, Janna Crabb. (Ages 7, 8, 9) 1st - Alyse Holden, Keith Holden; 2nd - Karen Mills, John McAdam, Katja Guelich. (Ten years and older) 1st - Kristen Holden, Maurissa Holden, Megan Holden; 2nd - Sean Holden, Greg Holden, John Moschitta, Andrew Chan.

Coming Events:

This Friday - ping-pong ball and cup races

Next Friday - balloon and ping-pong ball races

On-Site Program

After a strenuous hour of scavenger hunting last Friday morning, the kids were delighted to return to the recreation building and be treated to ice pops.

Coming Events

This Friday - Halloween day
Next Friday - County fair

As an extra special event, the annual International Dinner for families of children enrolled in the On-Site Program will be held on Thursday, August 14 at 5:30 p.m. at the Recreation Building. Families are asked to bring two dishes of food specialties from their native countries for all to sample. A first-rate movie will be shown after dinner.

School For Tots

The Upton Nursery School is now enrolling three and four-year olds in classes beginning in September. Children participate in a stimulating program either two or three mornings a week. Tuition fees are reasonable. Parents may assist in the classroom, or pay an additional modest fee for the services of a teacher's assistant. For information, call Karen Brunschwig, 924-0030, Ruth Fernow, 929-8465, or Colin Stewart, 286-9616.

Safety Shoes

The Safety Shoes office, located at 14 S. Railroad (Bldg. 88), will be closed the week of August 11th, and will reopen on August 18.

Arrivals & Departures

Arrivals

Michael R. Curtis.....Plant Engrg.
Harris E. Fischer.....Energy & Env.
Andres J. Kreiner.....Physics
Patrick A. Thompson.....Accelerator
Nancy J. White.....Physics

Departures

Carl H. Distenfeld.....Saftey & Env. Prot.
Marie A. Hesekiel.....Medical
Hwei-Lin Hong.....Energy & Env.
William L. Keith.....Accelerator
Alan D. Isaacson.....Chemistry
Rosemary Kanuga.....Medical
Pamela T. Kydes.....Physics
Donna E. Moguel.....Accelerator
Joanne Rosinski.....Biology
Neil Ross.....Chemistry
Rudolf E. Slovacek.....Biology
George A. Zimmer.....Nuclear Energy

