BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Macrophage cells attacking long (60 micrometer) glass fibers in the lung of a rat.

Talking On Air

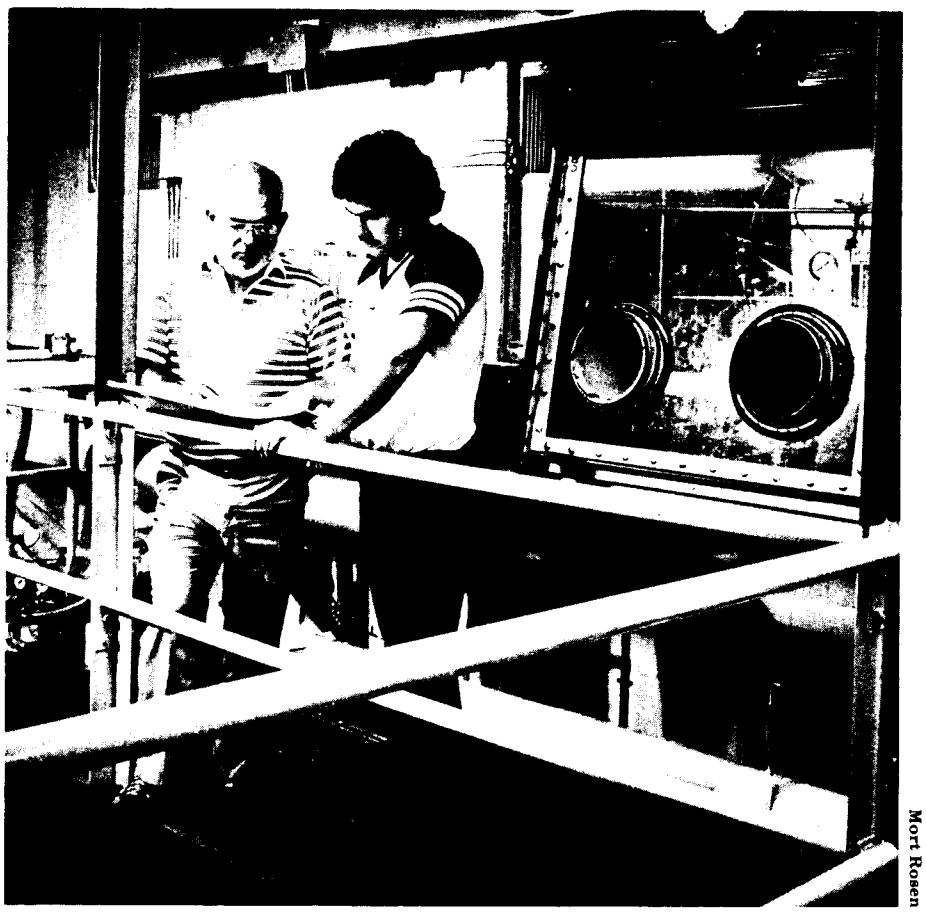
We seldom stop and think about the part of our environment we depend upon most heavily—twenty-four hours a day, in fact. The air we breathe supplies us with life-giving oxygen, but it can also bring us into contact with carcinogenic agents that we cannot normally sense. The detection of these agents, and the determination of their probable effects on the human biological system, is the domain of Robert Drew, coordinator of the Environmental Health Sciences Program at Brookhaven's Medical Research Center. Drew says, "In the six years I've been here I've recruited an excellent staff and developed a multi-faceted program that is now examining problems as far reaching as air pollution, and as specific as glass fibers found in the air of a workplace, while also doing work on the technological side of inhalation exposure."

In one of the Medical Department's studies, "We're comparing anatomical change with biochemical composition and pulmonary function, or physiological change, in rodents, subsequent to exposure to some known air pollutants," said Drew. The studies, which are being conducted for the National Toxicology Program, have shown that, "pulmonary function measurements are capable of showing change at exposure concentrations where anatomical measurements, at the level of the light microscope, show little or no damage. Thus, we have domonstrated a functional lesion," said Drew. "Exactly what this means and whether it will have some implication for changing test protocols remains to be seen," Drew added.

Among the pollutants studied in the above experiment was ozone, which provides a fascinating paradox in terms of its health effects. There is a layer of ozone in the outer atmosphere which serves as a shield for the earth from the sun's harmful ultra-violet radiation. Ozone is also present close to the earth's surface, where it is produced by an interaction of the sun's rays with air pollutants. Inhalation of ozone produces lung damage and a four hour exposure of research animals to six parts per million (ppm) is universally fatal. The current EPA ambient air standard for ozone is 0.12 ppm and the ozone concentration often exceeds this during air pollution episodes. Thus we have a very narrow range between ambient levels and highly toxic concentrations of ozone. This is a source of concern to toxicologists and will continue to be monitored closely in the future.

One of the department's current projects is a study of the effects of the inhalation of glass fibers, supported by the Thermal Insulation Manufacturers Association. The study compared the effects of long (60 micrometer) fibers, versus short (5 micrometer) fibers. Since particular care had to be exercised in obtaining fibers of the correct lengths, only very small quantities were available for the study. This precluded the use of standard inhalation techniques which require large numbers of particles. An instillation technique was developed which introduces the fibers into the lung in an aqueous suspension instilled via the mouth and trachea. With this new technique the distribution of fibers in the lung that occurs in standard inhalation can be duplicated while using only a fraction of the usual number of particles.

"The results of this study have shown unequivocally, and somewhat surprisingly, that glass fibers dissolve in tissue," said Drew. Long fibers tend to dissolve more rapidly than short fibers. To date there have been minimal adverse health effects observed due to these specific fibers. If these results hold up through the rest of the testing it will be very important news for the insulation industry which is shifting to the use of Fiberglass in place of asbestos which has already been shown to cause fibrotic lung disease and also cancer.



Mort Rosen

Robert Drew (left) and Peter Bonti review data while on the upper level of the chamber room where many inhalation experiments are carried out. They are standing next to a glove box which is used by experimenters to avoid direct contact in the handling of toxic materials.

Much of the work done at Brookhaven in inhalation toxicology involves the technology behind experiments. One of the most important aspects of experimental design is the protection of the experimenter from the test aerosol. This has led to a system within a system approach for handling highly toxic agents where the actual experimental chamber is enclosed within a second chamber, the experimental chamber being kept at a lower air pressure so that any leakage will be in to and not out of the experimental chamber. The second chamber is also maintained at a lower air pressure than the room in which it operates, and the entire experimental center is at lower pressure than the rest of the building and the outside air. Thus, any flow of air will be towards the center of the system, minimizing the possibility of accidental exposure in case of leaks.

Most of the inhalation systems used at Brookhaven are designed here due

(Continued on page 3)

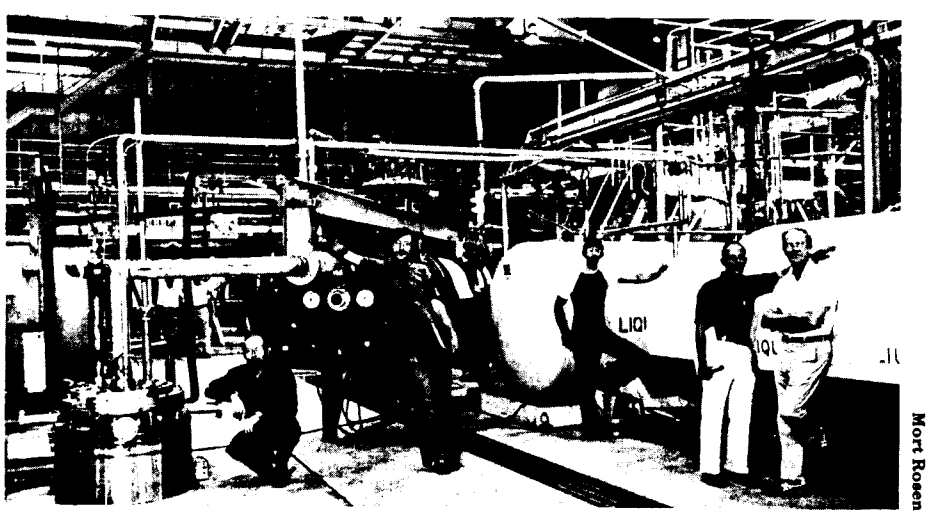
Overcoming Resistance With Uncommon Cold

"Cool it!"

Most people would interpret that expression as an admonishment to relax. But to the members of the Cryogenic Division of Project ISABELLE, it's a call to action.

The term cryogenic is formed from the prefix *cryo-*, meaning cold, and *-genic*, the suffix for producing. The Cryogenic Division, then, is concerned with producing cold. But not common cold. The temperature region with which the Cryogenic Division is concerned hovers close to absolute zero.

What's the connection between such low temperatures and a proton-proton collider? The accelerator's two intersecting proton beams will be guided in their circular paths by superconducting magnets. Extreme cold causes the conductor used in these magnets to lose all resistance to the flow of electrical current, which keeps power costs to a minimum and makes compact magnet design possible.



Mort Rosen

During the recent forced-flow test of Cable Magnet LM-7, the Cryogenic Division's Operating Group gathered around the test setup (from right): technical supervisor Herb Hildebrand, standing by a 1000 gallon helium storage dewar with mechanical engineer Joe Bamberger, and mechanical technicians Al Ravenhall, Bill DeJong (leaning on the outer vacuum tank of LM-7), and Dave Kipp (near the subcooling dewar). Not pictured is Frank Heimroth who was handling the night shift operation.

The task of the Cryogenic Division is to provide the refrigeration systems needed to operate the superconducting magnet system. This refrigeration must be available now, for testing the magnets, as well as later, during the operating period.

Some of the Division's efforts to date have centered on the helium refrigerator that will cool the whole accelerator. Already under construction at Koch Process Systems, Inc., near Boston, this refrigerator will be the largest in the world, cooling an initial charge in excess of 3,000,000 cubic feet of helium gas.

The cryogenic systems used for initial testing of the magnets are on a much smaller scale — but they must accomplish the same basic tasks as the full-scale system. Until some weeks ago, all tests of the Palmer cable magnets were conducted with liquid helium, typically at 4.5°K (degrees Centigrade above absolute zero), in two 20-foot deep vertical dewars. These double-walled, vacuum-insulated vessels have been valuable in testing

(Continued on page 2)

Aloft At Last!

"It's just the sort I like, a fast two seater, sporty looking, and very high performance." If these sound to you like the words of a proud new sports car owner you're not too far wrong. Only about 10,000 feet!

The quote belongs to Gene Rogers who recently completed, six years and eight months to the day after he started, construction of his own Piel Emeraude airplane. Working on the plane an average of twenty hours per week, Rogers spent over six thousand hours building the plane and installing its instrumentation.

The Emeraude has a wingspan of 26'6" and is 21' long, small but certainly not diminutive. Rogers built the wooden framed, Dacron covered plane from spruce and mahogany plywood in his basement, stopping to add an addition to the basement when he knocked out the wall of his son's old bedroom for additional work space.

Doug Humphrey

Gene Rogers stands next to the product of over 6000 hours of labor, his homebuilt Piel Emeraude airplane. There are only about thirty of these planes presently operating in the United States.

"Since I was about 12 years old I've always had a dream of building an airplane," said Rogers, and it was with that idea in mind that he first began to fly in 1968. This was not Rogers' first experience with planes, however, as he had previously built model planes professionally, publishing twenty-three articles on their design.

How does one find the patience to work for so long on a single project? According to Rogers the secret is planning ahead and knowing what you're getting into. Before deciding on the Emeraude, he spent three years looking at designs and talking with people who had already built planes. "It's very important to do research ahead so you know what you're doing, get it right the first time and don't get discouraged," said Rogers. He also found it helpful to work on just one part of the plane at a time, meeting a goal every few months, rather than looking years ahead to the project's overall completion.

The plane flies at a top speed of 155 mph and has a safe range of 350 miles. Cruising altitude is around 10,000 feet but with oxygen Rogers can take the plane as high as 18,000 feet. The craft weighs 960 pounds. when empty and can hold up to 600 pounds including passengers, fuel and baggage. Originally Rogers planned on spending five to six thousand dollars on the plane, but with inflation, costs have run to eight thousand dollars. The completed plane is now worth twenty thousand dollars, but, "I never kept real close track of how much it was costing me or how much it was worth. The fun was in the building of it," said Rogers.

Rogers expects to fly his plane 60-70 hours per year and is planning on flying to Florida this winter. Next summer he hopes to fly to Oshkosh, Wisconsin, to attend an annual fly-in of 10,000 planes, 500-600 of which are homebuilt, at the site where he first saw an Emeraude.

The Emeraude can be used not only for transportation, but also for aerobatics such as loops and barrel rolls. "Something tells me I may want to get into this field in the future," said Rogers. He is also considering adapting the plane for amphibious use some day.

—Derek McCalmont

Reports Available

The following reports are now available to the Laboratory staff and to affiliates of the DOE, AUI and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Dept. of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. Staff members should call Ext. 5068.

BNL-51393
A Methodology for Adjusting Disaggregate Input-Output Models to More Aggregate Models. P.J. Groncki

BNL-51435
Evaluation of Flat-Plate Photovoltaic/Thermal Hybrid Systems for Solar Energy Utilization. J.W. Andrews

BNL-51445
Methodologies for Estimating Short-Run Industry Demand Elasticities for Petroleum Products. G. Anandalingam

NUREG/CR-2516
BNL-NUREG-51499
Characterization of TMI-Type Wastes and Solidified Products. Quarterly Progress Report April — September 1981. A.J. Weiss, et al

BNL-51500
Methanol-Based Heat Pump for Solar Heating, Cooling and Storage. Phase III. Final Report. P.O'D. Offenhartz, et al

BNL-51510
Toxicity of Arsenic and its Compounds. P.G. Green

BNL-51512
Chemical/Hydrogen Energy Systems. Annual Report Jan. 1, 1981 — Dec. 31, 1981. M. Beller, et al

BNL-51517
Waste Form Development Program. Annual Progress Report Oct. 1980 — Sept. 1981. G. Arnold, et al

NUREG/CR-2686
BNL-NUREG-51530
Review of Load Combinations for NSSS and BOP Piping and Equipment of Mark III Plants. A.J. Philippacopoulos, et al

NUREG/CR-2192
BNL-NUREG-51409
Vol. 1 #2
Evaluation of Isotope Migration — Land Burial. Eater Chemistry at Commercially Operated Low-Level Radioactive Waste Disposal Sites. Quarterly Progress Report April — June 1981. K.S. Czyscinski. et al

Overcoming Resistance

(Cont'd)

the basic magnet design and proving concepts.

But when the accelerator becomes operational, its magnets will be arranged horizontally, not vertically, and boiling liquid helium will not be used as the refrigerant. The magnet coils will be tightly enclosed in their own cryostats and the helium refrigerator will deliver compressed helium gas cooled to below 3°K. This is called forced-flow cooling. To test the magnets in an environment similar to that of the final accelerator, a forced-flow test rig was designed and built by the Cryogenic Division.

The horizontal forced-flow test began early this month using LM-7, a magnet which had passed vertical dewar tests in March. Mechanical engineer Joseph Bamberger supervised the cryogenic aspects of this test while magnet questions came under the jurisdiction of physicist Alan Stevens. For this test, LM-7 was wrapped in many layers of insulation, inserted into its outer vacuum shell, and connected to the refrigeration system.

This system cools helium in steps, until its temperature is as low as it will be in the coldest magnet in the actual accelerator. From a central refrigerator, helium gas is piped through two subcooling dewars. At the first dewar, the temperature drops to about 3.8°K; at the second, it falls to 2.7°K.

"Reaching such low temperatures is not easy because the thermodynamic efficiency of the refrigeration cycle drops off drastically at lower temperatures," Bamberger explained. "The amount of power needed to lower the temperature one degree — from 3.8°K to 2.8°K — is a third again as much as is required in going from room temperature to 3.8°K."

The encouraging results of the forced-flow test show that the efforts of both the Magnet Division and the Cryogenic Division have paid off. In addition to proving the efficacy of the basic refrigeration design under construction for the accelerator, these tests have confirmed that the magnets perform as well horizontally as vertically and that their quench protection capabilities remain intact even at the lowest temperatures. Stevens explained, "Approximately 30% more energy was required to induce quenches in forced-flow, indicating better stability in this mode. Although quench velocities were observed to be slower than in liquid, the magnet could not be damaged by absorption of its own energy under even the most severe conditions."

The next major combined test of the accelerator's magnet and refrigeration systems is scheduled for the spring. At that time, a series of magnets will be set up in the accelerator tunnel and operated in the forced-flow cooling mode.

Once the test has confirmed the ability of all the accelerator's systems to work together under actual operating conditions, work at Project ISABELLE will concentrate on completion of those systems and on magnet production. Keeping up with the magnet production rate will call for a more streamlined procedure than that employed in the present forced-flow test. That's what MAGCOOL is for.

MAGCOOL is the name given to a forced-flow system now in the final stage of assembly in Bldg. 902. "This is a unique production cooling facility," said Bamberger. "With it, we will be able to test five magnets simultaneously, at various stages of their test sequence, in order to keep up with the anticipated magnet production schedule." MAGCOOL was conceived and designed at BNL and built to exacting specifications in Columbus, Ohio, by CVI, Inc. Although it is a large system, its components required precision assembly techniques, and, said Bamberger, "We were quite concerned about possible damage during shipment of this equipment from Ohio. But the truck drivers were cautioned and the equipment was shipped on air-ride suspension trailers, so everything arrived here in perfect condition."

Prior to actual accelerator operation, the final test of the cryogenic system will come after the helium refrigerator is completed and installed in the Service Building. With all the superconducting magnets in place in the accelerator tunnel, the system's cooling capability will then be tested, sextant by sextant.

— Anita Cohen

Inside Info

Sol Pearlstein, director of the National Nuclear Data Center, was named a Fellow of the American Nuclear Society at its annual meeting held in Los Angeles last month. Pearlstein received the honor, "For his vision and leadership which have guided and developed the National Nuclear Data Center as a supplier of quality nuclear data to the nuclear science and technology community plus his skill as a physicist which has led to important contributions in cross section evaluation."

New AUI Benefit Bks. In The Mail

The new AUI Insurance and Retirement Plan Booklet and Certificate of Insurance has been prepared and will be mailed next week to the home address of all active and retired employees.

The booklets describe the employee benefits program, which covers the Medical, Life, Long Term Disability and Travel Accident Insurance, and the Retirement Plan.

If you have any questions concerning the Group Insurances or Retirement Program, please contact Personnel Services, Ext. 2877 or 7516.

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Air

(Continued)

to the fact that a gas or particle under study will often possess unique qualities not taken into account by a conventional test system. One example of this is the upcoming testing to be done on cadmium for the National Toxicology Program. Cadmium poses a dual problem in that it is a particle and a potential carcinogen. Particles present special difficulties as the experimenter must control and measure both mass concentration and particle size. In addition, any particles which have deposited in the exposure system will remain whereas gases will rapidly diffuse away. Due to cadmium's suspected carcinogenic properties special safety precautions are being taken with this experiment such as enclosing the generation system inside a secondary containment system analagous to the one described above and including an alarm and automatic shut off if any change in pressure should occur.

— Derek McCalmont

Art Show

An art show from the Elaine Benson Gallery in Bridgehampton will be presented at Berkner Hall from August 11-20. On display will be artwork centered around the theme "Containers."

Opening night is August 11, at 5 p.m., when employees can come and meet some of the artists. From August 12-20, exhibit hours will be 11:30 a.m. to 1:30 p.m., weekdays only.

Picnic

Today is the last day to sign up for the Afro-American Culture Club's "Food of All Nations" picnic, on August 14 from 10 a.m. to 6 p.m. Make reservations with Mary Durham, Bldg. 901B, Ext. 7982.

Doug Humphrey

On July 18-20 students and their advisors from Howard University, Washington, D.C., visited BNL to participate in the MARC (Minority Access to Research Careers) Program. With BNL's Harvey Thomas and Ellen Anderson (far left) the group is pictured at the Brookhaven House. They also toured Medical, Biology, Applied Math, the Light Source, the High Flux Beam Reactor and the AGS. The students' fields of study include chemistry, biology, physics and psychology.

Speakers Bureau

Irvin Meyer (Chem.); **William Thomlinson** (NSLS), Suffolk County Science Explorations '82, Glassblowing Exhibit and Synchrotron Radiation, April 5.

Louise Hanson (DEE), Continuing Education at Hauppauge/Women's Career Conference Day, Women in Business — Science Opportunities, April 3.

Martin Plotkin (Accel.), Amityville High School Career Day, Careers in Science and Engineering, April 21.

R. C. Anderson (DO), Rotary Club of Stony Brook, BNL General, May 6.

Ellen Gannon (DEE); **Jeanne Penoyar** (DNE); **Ruth Wright** (Bio.), William Floyd High School Career Day, Selected Careers/Biology, Chemistry, Math, May 11.

Gus Prince (DNE), McKinney Jr. High School, Science Careers at BNL, May 12.

Michael Creutz (Phys.), Nassau Science Explorations at Hofstra, Elementary Particles, May 18.

Robert Glasmann (AGS); **Avril Woodhead** (Bio.), The Long Island Junior High School Congress, Science Judges, May 25.

Vance Sailor (DNE), Huntington Village Republican Club, Nuclear Power, May 26.

John Andrews (DEE), Educational Advisory Council, Heat Pumps and Solar Panels, July 12.

Service Awards

The following employees will receive service awards during the month of July:

Thirty-Five Years

Ralph P. Shutt ..... Physics
Frederick J. Silkworth, Jr. ..... Chem.
Irene G. Steele ..... Biology
Norman A. Still ..... Fiscal
Arthur B. Wright ..... Accelerator

Twenty-Five Years

John S. Bookless ..... En & Env.
George Dioguardo ..... S&M
Dorothy K. Groobert ..... Accelerator

Twenty Years

Vincent J. Angeloro ..... Plant Eng.
Stephen W. Feldberg ..... En & Env.
Robert J. Liegel ..... Physics
Edward Skrezec ..... Staff Services
Hugh P. Yerry ..... S&EP

Ten Years

Robert A. Bari ..... Nuclear Energy
Theresa A. Biamonte ..... Physics
James H. Clinton ..... Nuclear Energy
Miguel Correa ..... S&M
John J. Dunn ..... Biology
Jack H. Gandrey ..... Accelerator
Jose Medina ..... Plant Eng.
Krsto Prelec ..... Accelerator
Merle J. Pringle ..... Plant Eng.
Peter Soo ..... Nuclear Energy

Arrivals & Departures

Arrivals

Valerie M. Miller ..... Medical
John P. Orris ..... Plant Engrg.
Gopalan Rajeswaran ..... En. & Env.

Departures

This list includes all employees who have terminated from the Laboratory, including retirees:

Edward J. Grove ..... Accelerator

Aviation Club Trip

The Brookhaven Aviation Club's second trip of the season will be to Atlantic City. The "squadron" for the 1-1/2 hour flight will depart from Brookhaven Airport on Wednesday, August 11 (rain date August 12).

Anyone interested in going along and sharing expenses call Rod, Ext. 4805, Ed, Ext. 4846, or Ron, Ext. 7101.

T-Shirt Reminder

Today is your last chance to order T-shirts commemorating "Brookhaven National Laboratory — Summer '82." T-shirts cost $5 each, and each order must be accompanied by either a cash payment or a money order made payable to "Renee Flack-T-shirts '82." No personal checks please. Bring or mail orders and payment to Renee Flack, Room 112, Bldg. 460, Ext. 3316.

The recent completion of AGS Experiment 748 called for a celebration. But what would be a good way to commemorate it? How about a rousing game of "Pin the Spin on the Proton?" This seemed appropriate since the experiment was devoted to studying the interactions of high energy protons with a polarized proton target, where most of the protons spin in the same direction. In this test of skill and polarization savvy, here's one contestant who came close to the mark.

Hospitality News

The Hospitality Committee's next monthly morning get-together will be held Tuesday, August 3, from 9:30 to 11:30 a.m. in the Brookhaven Center. A formal program will not be presented in order that we may spend the time meeting newcomers and visitors to the Laboratory and greeting old friends. All wives of Laboratory employees and guests are welcome. Please come and bring the children. Babysitting will be provided free of charge. Coffee, tea and danish will be served.

CREF Values

June	51.94	July	51.19
August	48.26	September	45.89
October	47.61	November	49.61
December	48.33	January	47.49
February	44.88	March	44.48
April	46.32	May	44.53

June $43.34

Cafeteria Menu

Week Ending August 6, 1982

Monday, August 2

Cream of potato soup	(cup)	.65
	(bowl)	.75
Ham & potato au gratin		1.80
Beef liver w/onions & 1 veg.		1.75
Hot Deli: Meatball hero		1.90

Tuesday, August 3

Lentil soup	(cup)	.60
	(bowl)	.70
Roasted turkey w/stuffing & giblet gravy		1.85
Corned beef & cabbage		1.85
Hot Deli: French-toasted ham & cheese		1.75

Wednesday, August 4

Beef noodle soup	(cup)	.60
	(bowl)	.70
Old-fashioned beef stew on egg noodles		1.90
Baked ziti w/thick meat sauce & 1 veg.		1.85
Hot Deli: BBQ pork sandwich	(bread)	1.80
	(roll)	1.90

Thursday, August 5

Split pea soup	(cup)	.60
	(bowl)	.70
Veal pattie Parmesan & 1 veg.		1.80
or w/spaghetti		2.00
Sauted chicken breast on rice		1.85
Hot Deli: Roasted top round of beef	(bread)	1.90
	(roll)	2.00

Friday, August 6

Fish chowder	(cup)	.65
	(bowl)	.75
Beef hash & 1 veg.		1.75
Breaded fish fillet & 1 veg.		1.80
Hot Deli: Clam boat		1.90

Softball

Scores for week of July 19

Leagues I and II

Tuesday night games rained out.

Big Sticks 5 — Ice Pops 4

A defensive game by both sides. The Big Sticks started out slow, but managed to get their hitting together for the winning run in the 6th inning.

League III

AMD 17 — Magnuts 9

F. Devito and C. Bergh went 4 for 5, J. Bennett went 3 for 3, and C. Neuberger went 3 for 4 with a home run.

Dirty Sox vs. Titans

Rained Out.

League IV

Nothing reported.

League V

TNT 13 — Turkeys 7

Survivors 27 — E-Z Riders 18

(Via the Grapevine, we hear that the No Names beat the NADS.)

League VI

Random Sample 15 — No Feedback 10

Mole-Esters 15 — Who Cares 6

Who's On First 9 — The Source 6

V. Lettieri and J. Rowehl had home runs. Spectacular plays were made by Lois Marascia at Second and Vivian Gordon in Short Field.

Mudville Sluggers 20 — Underalls 6

Makeup Game:

Who's On First 6 — The Source 5

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants. In keeping with the Affirmative Action plan, selection decisions are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all non-scientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment.

Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2882.

The vacancies listed below have been exempted by the Director's Office from the current freeze on open requisitions.

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

1722. TECHNICAL POSITION - Requires AAS in electronic or mechanical technology or equivalent experience. Responsibilities include the assembly, test and maintenance of precision apparatus, knowledge of ultrahigh vacuum practices and machine shop techniques. Experience in the areas of digital electronics and/or cryogenics also useful. Will assist in construction and support of experiments on x-ray beam lines at the NSLS. Physics Department.

1723. MECHANICAL ENGINEER - Requires a BS or equivalent. Individual will be involved in the coordination and scheduling operations of technical groups involved in the assembly of superconducting accelerator magnets. Responsibilities will include assuring that magnet assemblies are made according to specified procedures and required mechanical and electrical parameters. Accelerator Department/ISABELLE Project.

OPEN RECRUITMENT: Opportunities for present Laboratory employees and outside applicants.

1724. SENIOR STANDARDS INSPECTOR - Requires significant experience in all phases of mechanical inspection, especially optical tooling. Proficiency in the use of inspection equipment and non-destructive testing equipment and a basic knowledge of metals, machining, welding and sheetmetal fabrication is essential. Will perform all phases of in-process and acceptance inspection of purchased and Laboratory fabricated parts and equipment. Central Shops Division.

1725. MASON - Requires training and experience in performing a wide variety of cement and concrete work. Temporary. Plant Engineering Division.

Autos & Auto Supplies

79 HONDA - CM400T, 2,000 mi., garaged, must sell, $1,000. 981-0181.

69 VW - good engine, body needs work, good work car, $300. John, 878-4883.

SNOW PLOW - Fisher, 7 ft., power angle, 3 yrs. old, used once. New $2,800, asking $2,000. 281-0804.

78 PINTO - excel. cond., am/fm stereo, 8-track, 4 sp., 4 cyl., good on gas, must sell, $2,000. 732-8241.

75 AMC PACER - automatic, 6 cyl., am/fm stereo, excel. cond., $1,800. Ext. 4120 or 698-3030 eves.

80 PONTIAC - Phoenix, excel. cond., 20,000 mi., full power, many extras. Jim, 669-7428.

65 VW - 6 volt system, rebuilt king pin front end, motor needs work, ideal for dune buggy, $200. Joe, Ext. 5131.

76 TOYOTA COROLLA - Deluxe, 4 dr., red, a/t, r/h, recently rebuilt transmission and valve job, high mileage, excel. transp., asking $1,900. Tom, 348-7884.

74 MONTE CARLO - loaded, full power, am/fm, 8-track, a/c, clean in/out, 2-tone silver w/burgundy inter., $2,500. Mark, Ext. 5176.

73 CHEVY - Impala, 4 dr., p/b, p/s, radio, a/t, new tires, brakes, tune-up, excel. cond., 93,000 mi., $550. Available after August 3. Ext. 3701.

77 DODGE VAN - B-200, 318, 3 sp., windows all around, am/fm stereo, no dents, no rust, excel. in/out, $4,000. Joe, Ext. 7961 or 878-2655.

81 MUSTANG - am/fm, like new, $5,995. 234-7225.

79 CHEVY - Monza, s.w., 2 dr., low mi., all power. 475-4596.

81 BUICK - Regal Ltd., excel cond., 25,000 mi., loaded, $7,850. Jim, 669-7428.

80 SUZUKI - GS1000L, custom seat, luggage rack, cruise control, many extras, warranty, $2,900. Ext. 7187 or 981-9474.

TIRES - General P195/75R14, steel belted, whitewalls, set of 4, $100. Ext. 3392 or 475-8330.

79 HONDA HAWK - Motorcycle, 400cc, like new cond., $995. 588-0805 eves.

80 MAZDA - Sport Pickup, immaculate, stereo w/tape, 22,000 mi., 26 mpg., local, 40 mpg hywy., cap. 727-7741.

WHEEL COVERS - full, 13", no dents, all four, $20 set. Dave, Ext. 5211.

73 FORD PICKUP - F100, 103,000 6 cyl., std., with cap, extra wheels, $1,500. 265-3731.

71 CHEVY - Chevelle, mag wheels, stereo, 283 eng., a/t, $2,200. 265-3731.

70 CAMARO - mag wheels, 80,000 mi., flares, a/t, 327 eng., $1,900. 265-3731.

75 CAMARO - green, p/s, p/b, V8, 350 eng., $2,500. 584-6425.

77 CHEVY PICKUP - C-10, ½ T, 40,000 mi., $2,500. R. Boie, Ext. 4232.

70 VW - Bug, good in and out, engine needs work, asking $400. James, 473-2059 eves.

71 VW - Superbeetle, 7,000 mi. on new eng., semi-auto., new tires, Saed, Ext. 4049 or 331-1665.

68 COX CAMPER - sleeps 6, new top, $700. 399-0828.

78 TRANS AM - 6.6 lt., gold, beige inter., p/s, p/b, DE, 4 sp., t-top, am/fm, 8-track, $4,995 firm. Roy, Ext. 4664 or 744-8779.

72 OLDS - Ninety-eight, auto., a/c, fully powered, am/fm, 8-track, clean, good running cond., $700; 71 Honda motorcycle, 350cc, custom, many extras, $700. Frank, Ext. 4113.

70 DODGE - Dart, runs reliably, good tires, body dented, some rust, $150. Ext. 7637 or 286-4639.

74 PONTIAC - full size, runs well but needs some work. Bernie, Ext. 4842 or 331-2298.

TIRES - (2) G78x14 and wheels, 5 lug, $15 each. Jim, 744-3792.

TIRE - mounted on rim (new-type spare), never used, from Caddy, $10; tail-gate for Chevy C-10, $30. Jim, Ext. 4040 or 289-0876.

78 DODGE - Aspen, 6 cyl., p/s, p/b, a/c, am/fm stereo, cassette, $2,750. 399-4972.

74 SUBARU DL - 2 dr., 80,000 mi., 30 mpg., new brakes, inspection, motor & inter. excel., $900. Roger, Ext. 3578 or 878-4864.

74 PLYMOUTH - Duster body, front end damaged, good for parts, $75; 1974 Plymouth 360 eng., $150; (2) G-60-14 tires on 8" Cragar rims, $90; 1973 Plymouth 340 eng. w/4-sp. & posi. rear, many extras. $500. Kim, 727-0429.

78 HONDA - CX500, good cond., new Dunlops, S&W, Shoei, extras, $1,400 neg. Ext. 2259 or 473-8356.

70 PONTAIC GTO - 400, excel. inter. & mech. cond., damage to trunk & rear bumper, a/t, am/fm stereo, $600. 727-1429 eves.

69 DODGE - Charger body, excel. cond., primed, ready to paint, $250., 473-5890 after 5 p.m.

74 CHEVY - Step-Van, V-8, 4 sp., refrigerated, insulated, fiberglassed, heavy duty front and rear, $4,000. 654-5169.

VALVE COVER - for Datsun 280Z, highly polished, new, $50; 280Z factory rims w/steel belted radials, 1 almost new, 1 half worn, $45 ea. or $80 both; rims w/radial snows for Pontiac Ventura or Chevy Nova, $25. Larry, Ext. 7979 or 261-5030.

71 DODGE VAN - excel. cond., 6 cyl., a/t, $1,500. 878-1920.

Boast & Marine Supplies

21' FIBERFOAM - 1976, 165 hp, inboard/outboard, excel. cond., many extras, asking $6,000. 744-3030.

16' SPEED BOAT - fiberglass, steering controls & tank, new paint, $300. John, 878-4883.

18' SEACRAFT - 80 hp Evinrude, Tee-Nee trailer, good fishing boat, $1,600 takes all. Ext. 2352 or 473-9016.

12' SAILBOAT - styrofoam, $50. Ron, Ext. 3887 or Jeff, 286-0353.

22' SEAFARER SLOOP - 1979, loaded, 6 hp Evinrude, summer dockage/winter storage paid, $8,700. Bob, Ext. 4527.

SNARK SAIL BOAT - new, $200. Chris, 732-0863.

16' DUO FIBERGLASS V-HULL - very good cond., 80 hp Johnson (needs lower seal), w/con., Navy top, winter cover, trailer, other access. 581-6432.

14' SAILBOAT - fiberglass, 2 sails, $300. Dave, Ext. 3773 or 878-8113.

19' O'DAY MARINER - 1968, 4 hp Evinrude, trailer, spinnaker, $5,000. Olson, 289-8629 after 7 p.m.

Free

MALE KITTENS - adorable, avail. now. Ext. 2980 or 289-0532 after 6 p.m.

KITTENS - for adoption from local humane society. Carol, 928-9537.

SHEPHERD/COLLIE MIX - 1 yr. old, housebroken, gentle, spayed female, loves children. 929-8982.

Yard Sale

PORT JEFF. STATION - July 31-Aug. 1-3, 83 Gaymore Rd. Frank, Ext. 4312.

Miscellaneous

COLOR TV - 23", reconditioned Motorola, beautiful wood grain console, $150; Bogen stereo amplifier, excel. cond., like new, 35 watts per channel, $60; upright organ, Magnus Mode #535, 42 watts, $60; Siltronix 0-1500 watt meter, 2-50 MHZ, $50. 751-6418.

SCANNER - Bearcat, 4 channel, portable, new, $109.95. Paul, 727-4859.

DINING RM. SET - Trestle table, 2 leaves, 8 chairs, $400; mini bike, $100. 581-7656.

BEE HIVES - compl. w/double hive bodies, value $100 ea., asking $30 ea. 929-4949.

LAWN SPRINKLER - Melnor, traveling, $25; Manning-Bowman toaster, $9; lawn chair, $3; men's umbrellas, $3 ea.; storms/screens, $2. 472-1397.

ATARI CARTRIDGES - (2), Soccer & Street Racer, reasonable; double bed, mattress, box spring, wooden headboard w/frame, good cond. Ron, Ext. 3238 or 473-6862.

ELECTRONIC MEDICAL THERMOMETER - brand new, $10. Charlie, Ext. 3935 or 325-0968.

WASHER/DRYER - Whirlpool, portable, good cond., $125 for both. Ext. 5369 or 924-0581.

BASEBALL MITT - lefty, like new, fits 7-10 yr. old, $15. Frances, Ext. 4382 or 286-1339.

COLOR TV - 25" RCA XL100, console, excel. working cond., $200. Ext. 4131 or 5163.

BIKE - 16", $15. Liz, Ext. 2082 or 286-8563.

DOUBLE BED - mattress & box spring, $30. 928-2803.

AIR CONDITIONER - G.E., 14,000 BTU, 12 amps, 115V, plugs into any wall outlet. Ext. 3392 or 475-8330.

ELECTRIC RANGE - Sears, 2 ovens, both see-thru glass, good cond., $125. 475-5448 after 6 p.m.

DINETTE TABLE - w/4 chairs, wood-like finish, 1 leaf, $75; Technics SA-5070 receiver, BIC 920 turntable & 2 BIC speakers, $400. 473-5542 days.

FISH TANK - 55 gal. w/stand, hood, pump, filter, fully equipped, $175. Ext. 7187 or 981-9474.

CARPET SWEEPER - Bissell, Model #400, $10; square walnut table, 21"x25", $15. J. Candiano, Ext. 4144.

REFRIGERATOR - G.E., no frost, top freezer, gold, 14.2 cu. ft., 2 yrs. old, like new, $300. 878-0717.

CARPET - & foam rubber padding, 12'x14', beige nylon, $150. 286-0466.

FREEZER - upright, 6'x3', old but good, $75. 924-6751 eves.

STORAGE SHED - 14'x6', all alum. truck body w/sliding side windows, 3 doors total, $350. Tom, Ext. 4084 or 878-1060.

FREEZER - Wards, upright, $175; small refrigerator, $55. R. Boie, Ext. 4232.

ORGAN - classic model for church, studio, student, full keyboards & pedals, perfect cond. 728-0273 eves.

DESK - bedroom set; chair; kitchen set; phonograph; dishwasher; workbench; kerosene heater; shop lights. Don, Ext. 2225.

POOL - 18'x48", steel wall, winter cover, liner, oversize filter, needs bottom rim, $75. Frank, Ext. 4113.

WASHER - Frigidaire, large capacity, moved & can't use, asking $100; Sylvania stereo console, contemp. wood cabinet, am/fm, 8-track, turntable, complete, excel. cond., $125. Ext. 2456 or 878-4152.

POOL - Coleco, 12'x3', filter, ladder, hoses, used one season, perfect cond., $75. Frank, Ext. 3412.

KITCHEN CHAIRS - Bentwood, set of 6, needs refinishing, $200; metal chaise lounge w/mattress, $15; G.E. air conditioner, 7,500 BTU, $150; metal folding bed & mattress, good cond., $35. Jim, 744-3792.

GLASS PATIO DOORS - (2), 6' sliding, single pane glass, $50/both or $30 ea. Al, Ext. 3397.

WIDE ANGLE LENS - 28/2.8, Vivitar, M/MD Minolta mount, new, haze filter, lens caps. Felix, Ext. 7757.

MOPED - Batavus, excel. cond., only 500 mi., 160 mpg., ideal for visitors, $350. Ravi, 924-6835.

CAMERA - Ricoh SLR, 50mm, F1.7 lens, black, body perfect, $75. Alan, Ext. 2928 or 821-1389.

MIXING BOARD - Peavy 1201, $500; (2) P.A. columns, 4-105 in ea., $250; 29 gal. aquarium w/stand, power filters, pumps, plus many extras. $175. Kim, 727-0429.

POOL LADDER - s/s, 3-steps, for above or in-ground pools, $30; thru-the-wall filter, $10. Jim, Ext. 4040 or 289-0876.

BEDROOM SET - antique, 3 pieces, $140; 90" couch, $30; antique china cabinet, $500; queen waterbed, heater, liner, frame, $175. 924-4685.

EXERCISE BIKE - 2-way, $30; leather ice skates, 4 prs., szs. 6-11; stereo system, am/fm radio, cassette recorder, turntable, 2 speakers, $125; 17" b/w TV, $40, both like new. Ext. 3108.

PATIO UMBRELLA - 8 ft. dia., works well, $15; hi-fi console components, Magnavox turntable, amp-/tuner needs work, $10. Victor, Ext. 2395.

DRAPES - 2 pr., custom made, gold, Schumacher print, floor length, fully lined, fits 36" window w/wood rods. Walt, Ext. 4852.

WETSUIT - ladies, small, White Stag, worn once. Ext. 2298.

WASHER - G.E., heavy duty, excel. cond., $100; Penney's dryer, gas, deluxe model, large cpacity, A-1, $100; headboard, twin, orange padded, $5; Hoover Handi-Vac, like new, $20. 473-6546.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

CATSKILLS - 5 acres, hunt, fish, ski, stream on property, $15,000. 231-8479 after 6 p.m.

BAYPORT SOUTH - 1851 Landmark, modern 3 bdrm, study, studio, eik, l/r, fp, 1½ baths, city gas-/water, barn/loft, zoned horses, mint cond., treed, prime area, village. 472-1397.

YAPHANK - 3 bdrm. ranch, 2 large rms. on back, ½ acre, full bsmt., $13,000 7½% assum. mtg., $28,000 cash over. 924-6895.

WADING RIVER - custom built colonial, 4 bdrm., 2 baths, d/r, den, f/p, 2 car garage, full bsmt., private beach. Ext. 7727 or 929-4631.

RIDGE - 2 bdrm. on 100x100, deck, f/p, lake rights, $34,000. 929-6034.

S. SETAUKET - 4 bdrm. colonial, l/r, d/r, eik, den, 2½ baths, all appl., a/c, gas heat, ½ acre, new landscape, assum 7½%, $70,000's. 698-4823 after 5 p.m.

BIRCHWOOD - at Blue Ridge condo, 15 min. from Lab, 3 bdrms., many extras, facing golf-course, low $60;s. 698-7213.

WADING RIVER - property north of 25A, exclusive area, loverly wooded bldg. plot, slightly under 2 acres, asking $24,500. Owner, 928-0158.

For Rent

CENTER MORICHES - 5 rms., 2 bdrms., w/heat & hot water, adult couple with no pets preferred. 878-1561.

BIRCHWOOD - Blue Ridge condo rental, includes use of 9 hole golf course, indoor/outdoor pools, tennis courts, 2 bdrms., 1½ baths, excel. cond. 736-0333.

YAPHANK - 2 bdrm., unfurnished, full attic can be 3rd bdrm., full bsmt., oil heat, quiet area, near school, 5½ mi. to Lab, avail. 9/1/82, $450/mo. plus util. 924-3743.

SHOREHAM - furn. or unfurn., beautiful secluded grounds, walk to beach, for 1 yr., rent varies depending on space needed. 744-6804.

SHOREHAM - furn. house, 3 bdrm., private fenced backyard, 5 mi. from Lab, avail. from August 7 thru Sept. 9, $350 plus utilities. Ext. 3742 or 3761 or 821-9423.

ROCKY POINT - log cabin, 1 bdrm, semi-furnished, Aug. 1 or Sept. 1, $240/mo plus util. Ext. 4819 or 744-0681.

Car Pools

LAUREL/MATTITUCK - Carmen, Ext. 2663 or 298-4931 after 6 p.m.

BABYLON/WEST ISLIP - additional driver needed for 4 person car pool. Ext. 2500.

Lost and Found

LOST - Ross bike, brown, 3-speed w/Yale lock on basket, week of 7/16/82 at Men's Locker Rm. Entrance. Rich, Ext. 5284.

LOST - contact lenses in white case. Ext. 3565.

Wanted

CHRYSLER MOTOR - 6 cyl., 225 C.I., must be in good running cond., able to demonstrate. 286-1522 eves.

DOG CLIPPERS - motor driven. 581-7656.

OLD DOLLS - unusual dolls & toys also teddy bears. 475-4199.

TRAINS - Lionel, American Flyer, accessories, any cond. brings good price. Carole, Ext. 3362 or 924-4097 eves.

GOOD HOMES - for adorable kittens. Kathy, Ext. 3217.

RIMS - 14" for 1971 Plymouth Valiant. George Hrabak, Ext. 3536.

FREEZER - about 12 cu. ft., manual defrost. Kristin, Ext. 3372 or 744-6287 eves.

GUARDRAIL - for child's bed, the grandchildren are coming! 286-1214.

APARTMENT - furnished, in Rocky Point near 25A for senior citizen. Sept. occupancy. 928-2803.

MOTORCYCLES - bent or broken, any age or cond. Kevin, 281-8031.

ELECTRONICS PERSON - to repair my stereo system for a reasonable rate. Sue, Ext. 2888.

TIRES - C78-13, good to fair cond. Susan, Ext. 4267.

UTILITY TRAILER - 2 wheel, 4' bed, approx. $100 to spend. 924-6751 eves.

FRONT BUMPER - for 1970 Duster, without dents, will pay cash plus replacement. Tim, 727-7741.

NEW YORK APT. - 2 bdrm., upper west side, safe neighborhood, under $700/mo., $100 reward. Rob, Ext. 2697 or 2516.

CAR BICYCLE CARRIER - good cond., reasonable price. Victor, Ext. 2395.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the Bulletin.

EXTERMINATING - licensed men, all phases of pest control and termite specialists, no job too small, free estimates. 281-5445.

TRUCK FOR HIRE - moving, cleaning & other misc. work, Lab discount. 281-5445.

HOMESTYLE CATERING - very reasonable prices, for up to 100 people, Italian favorites. 744-1367 or 744-2870 after 5 p.m.

VERTICAL BLINDS - mini-blinds, wovenwood shades, discount prices, completely installed, shop-at-home service. Tony, 928-9241.

HOME IMPROVEMENTS - vinyl and aluminum siding, trim, roofing, gutters and leaders, custom carpentry, free estimates. Charlie, 744-3160.

CARPETS INSTALLED - quick dependable service, free estimates, repairs. Jim, 821-0187 after 5 p.m.

GENERAL CONTRACTOR - carpenter, extensions, dormers, garage conversions, basements, decks, kitchens, licensed. Jim, 698-2501 after 5 p.m.

HOUSE PAINTING - interior/exterior, professional, quality materials, insured. Bob, 289-7657 after 6 p.m.

WOOD DECKS - custom built, any shape & size, free estimates. John, 878-4883.

RELIABLE TEENAGER - desires part-time job, gal friday, in the afternoon. Also competent viola instruction available. Laura, 281-0843.

BABYSITTING - my home, daytime. Rose, 363-2768.

FIRESIDE CHIMNEY SWEEPS - fireplaces, wood, coal & oil flues, dustless removal, Lab discount, insured. Bill, 584-6425.

ASPHALT PAVING & SEALING - Bob, 475-4382.

SWAMI WAISEN - reveals your destiny thru Tarot cards, complete reading, only $5. Waisen, Ext. 7974 or 282-2515.

LAWN CUTTING - yard maintenance, clean-ups (garages, bsmts., etc.), Port Jeff. to Wading River. Bob, Ext. 2517 or John, 331-3358.

LIMO SERVICE - luxury chauffered for proms, weddings, airport or night on the town. Roy, Ext. 4664 or 744-8779.

PLUMBING & HEATING - Lab discount. John, 654-8189.

TUTORING - certified elementary teacher to tutor child at either home, previous experience with excellent result. Ext. 2072 or 929-8411.

HOME BURGLAR ALARMS - package includes panel, c/s monitoring, 2-doors,

4-windows, telstar enclosure w/speaker installed, $795. 666-3334.

TILE SETTERS - ceramic quarry tile, no job too small, free estimates. E. Harris, 475-6460.

ELECTRICAL WORK - licensed and insured, reasonable rates. 744-7824 or 744-0722.

BABYSITTING - lots of love, learning experiences other children, stories, music, age 1-4, non-smoker. Pat, 744-6210

Classified Ad Policy Deadline is 4:30 p.m. Friday for publication Friday of the next week.