BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

BNL Proposed for EPA's National Priorities List

On July 13, the Environmental Protection Agency (EPA) proposed the addition of 52 federal facilities to the National Priorities List (NPL) of hazardous waste sites. BNL was one of nine Department of Energy (DOE) sites proposed for the NPL in this update. At present, final and proposed sites total 1,224 nationwide, of which 115 are federal facilities.

The NPL identifies sites that warrant further investigation to determine if long-term remedial action is necessary. Once proposed, the sites are subject to public comment for 60 days. The actual listing on the NPL will be based on these comments and further EPA review.

After inclusion on the list, a site has six months to reach an interagency agreement; in BNL's case, that would involve EPA, DOE and New York State. Six months later, a remedial investigation/feasibility study must start.

The NPL is the result of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), better known as the Superfund, which was passed by Congress in 1980. CERCLA was again authorized for five years in 1986, when the Superfund Amendments and Reauthorization Act (SARA) was enacted.

Because one of the provisions of SARA was that Superfund applies to federal agencies, the U.S. Department of Energy (DOE) submitted a preliminary assessment and site inspection of BNL to the EPA in 1987. DOE's submittal was based on information gathered and provided by BNL.

The BNL site sits above the sole source aquifer underlying the entirety of Suffolk County. The Lab's inclusion on the NPL was prompted primarily by the potential threat to the aquifer below the Lab and to the adjacent areas to the southeast — largely from past practices at the Lab's old and current landfills.

"Our concern for the ground water has been the driving force behind several remedial programs in progress at the Lab for a number of years," said Bob Casey, Head of BNL's Safety & Environmental Protection Division (S&EP).

At the Aquifer Restoration Project, Jan Naidu, head of S&EP's Environmental Protection Section, inspects the pumping system that withdraws water from the ground and diverts it to the spray heads in the background, where any organic contaminants are removed.

Photos in this issue by Roger Stoutenburgh.

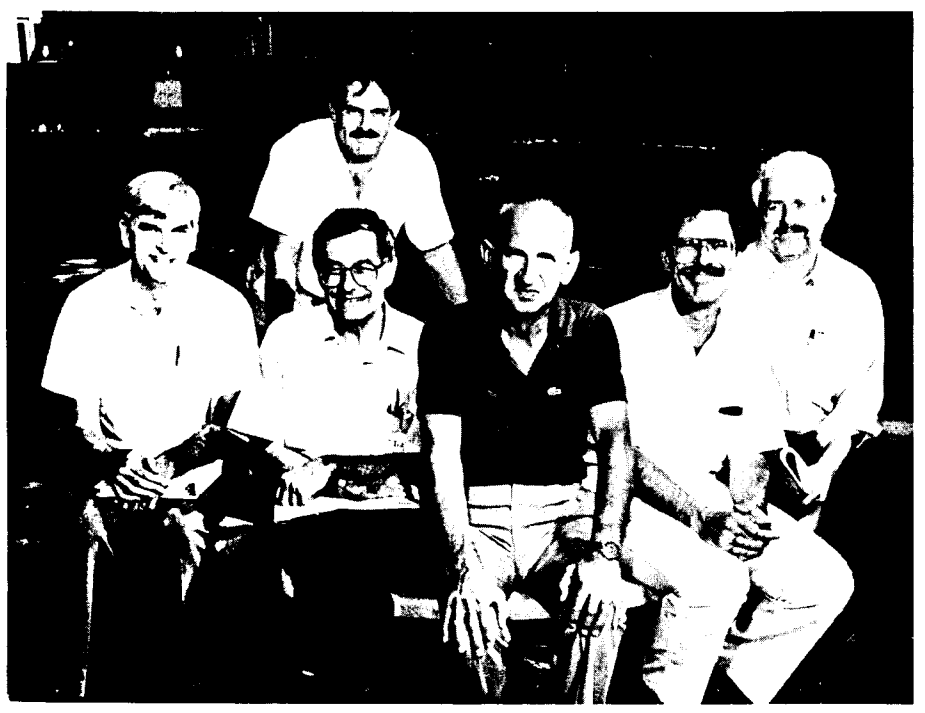
"However," Casey continued, "Lab employees should not be concerned since the Lab's drinking water supply wells are fully monitored to ensure that all potable water distributed for use is within applicable standards. Our programs are intended to ensure that this continues — that our drinking water and any ground water that moves out from Brookhaven is within standards. If the inclusion on NPL helps in achieving this goal, we welcome it fully."

Though the Superfund provides monies for cleanup when costs are not assumed by responsible parties, federal agencies assume monetary responsibility for their own sites.

"DOE is taking this very, very seriously," said Len Emma, who heads S&EP's Hazardous Waste Management and Environmental Restoration Section. "From the beginning of this administration, there has been a conscientious effort from both President Bush and Energy Secretary Watkins to take steps to correct potential problems at DOE facilities, and Secretary Watkins is reviewing a five-year plan that outlines monies

(Continued on page 2)

Experimenting With Ideas For SSC Experiments



Plans call for the proposed national Superconducting Super Collider (SSC) to come on line in 1998. And when it does, experimental apparatus has to be in place, ready to handle the streams of data that will be rapidly forthcoming as two beams of protons collide, each with an energy of 20 trillion electron volts.

Planning for these experiments was the motivation behind the two-day Workshop on SSC Experiments, held July 10-11, at BNL. From outside BNL, about 100 experimental physicists and other researchers joined the Lab's own staff in discussing designs for possible experiments, as well as research and development for detectors.

Among those involved with the proceedings were: (standing) Sam Aronson, Deputy Chairman of BNL's Physics Department; and (seated, from left) Thomas Dombeck, U.S. Department of Energy; George Trilling, Lawrence Berkeley Laboratory; Veljko Radeka, Head of BNL's Instrumentation Division; Howard Gordon, BNL, who heads the Omega Group in Physics; and Gil Gilchriese, SSC

Problems at U.S. Waste Sites: One Culprit is *Clostridium*

BNL researchers have found that an anaerobic bacterium called *Clostridium* exists in coal wastes and is capable of helping to dissolve metals, which allows them to leach into the ground water. The finding is a landmark in a project, funded by the Department of Energy, that was spurred by a nationwide problem with leaching from waste sites.

The BNL research project, begun in 1983, aims to understand the processes and the microorganisms that cause radionuclides and heavy metals — uranium, cadmium, lead, chromium, nickel and zinc — to leak out of buried wastes. The project's ultimate goal is to find solutions to the problem — a problem that affects many of the 1,224 sites throughout the country that are on or have been proposed for the Environmental Protection Agency's National Priorities List.

"Once we develop some basic understanding of the process, we can stop it at the source," said Microbiologist A. J. Francis of BNL's Department of Applied Science (DAS) who is working with DAS Chemistry Associates Cleveland Dodge and Jeff Gillow to study the action of anaerobic bacteria — bacteria that live in the absence of air — on buried wastes.

In sufficient quantities, radionuclides can be a threat to the groundwater; high concentrations of heavy metals can poison the water — causing, for instance, lead poisoning. To prevent this contamination, heavy metals and radionuclides are often reacted with iron to form an iron oxide "co-precipitate," which traps them.

Metal oxides, which are generally insoluble in nature, are also present in coal waste — bottom ash, fly ash — and in radioactive waste as lead oxide and uranium oxide. The oxides are very stable and are expected to last a long time underground. But sometimes they don't.

"We take for granted once the

(Continued on page 2)

Jeff Gillow works in a nitrogen-filled glove box as Cleveland Dodge (standing, left) and A. J. Francis (right) help out.

2-4-6-8 — Call When Problems Cannot Wait

It was a hot Thursday in June when Arnie Moodenbaugh, a physics associate for the Department of Applied Sciences, noticed that the laboratory adjacent to his office in Metallurgy, Bldg. 480, was too warm. The thermostat had been broken for a few weeks.

"We just let it ride," said Moodenbaugh.

But when the laboratory got hot and humid, he told building coordinator Jim Hurst, who called Maintenance Management, Ext. 2468.

With that phone call, the wheels were put in motion to solve the problem. It's routine in Plant Engineering's Maintenance Management Center, where an average of 85 maintenance calls come in each day.

As the coordinator for the largest service organization at BNL, Maintenance Management is faced with the task of organizing the work of about 200 BNL tradesmen and craftsmen, as well as any number of contract laborers.

"We're the focal point for all written intraLab requests, as well as all 2468 calls," said Chris Johnson, Maintenance Management Program Coordinator.

"Anytime anyone needs something done that is Plant Engineering oriented, they call Maintenance Management," said Chief Planner/Estimator Pete Eterno Jr.

And they're easy to contact — just dial Ext. 2468. Within seconds, you'll be talking to either Theresa Clark, Sarah Ebron or Pauline Gagnon, the three facility office assistants who take the calls.

They have the task of assigning priorities to the jobs and entering the job information into the computer. If the job is an emergency, they give it priority — and contact the appropriate supervisor to get the work done immediately.

Of course, not all jobs are emergencies — so what may seem like an emergency to one person may not be all that important in terms of the Lab's overall operation. According to Johnson, an emergency is any problem that presents a real threat to health, safety or continuity of operation.

Need some maintenance management? Call Ext. 2468, and you'll talk to either (seated) Theresa Clark, (standing, from left) Sarah Ebron or Pauline Gagnon.

"My job is to try to keep this all in perspective," said Johnson. "In general, emergencies should be a very small percentage of our work.

"Many 'emergencies' are caused by a lack of foresight," explained Johnson. "With better planning, the jobs could be called in ahead of time."

If a job isn't an emergency, Maintenance Management has more of a chance to approach the work efficiently. Since February, the department has been using a program called MCRS — Maintenance Control and Reporting System — as a planning aid. In addition to Eterno, there are six planner/estimators who help to oversee the work.

"We use our program to schedule and to sort the jobs, to try to prioritize them more and decide which ones need to be looked at before we release them to a shop," said Johnson.

Looking at the problem helps to assure that the correct type of tradesman or craftsman is sent to fix it and that the correct tools and parts are brought along. Of course, some jobs require special repair parts, and ordering them can take some time.

But no matter how long it takes, Maintenance Management sees the job to completion.

"We're the beginning and the end of the process," said Eterno.

On Friday, the day after Hurst called Maintenance Management, Felice Villani, an air-conditioning refrigeration engineer, went to work on the problem.

He found two problems: Not only was the thermostat broken, but the roof air conditioner had tripped on low pressure. He by-passed the thermostat and added refrigerant to the air conditioner.

"The first priority is always to get the A/C unit back on line," Villani said.

On Monday, Villani returned with coworker Keith Radich, and in an hour they had the thermostat fixed.

It was just another job well done for Plant Engineering. —Kevin Eber

Clostridium (cont'd)

wastes are in insoluble form, they will remain insoluble — but this is not so," said Francis.

Instead, according to Francis, anaerobic bacteria can produce enzymes and a variety of metabolic products including chelating agents, all of which can help to dissolve the metal.

"The bacteria reduce the iron — in the reduced form, it's more soluble — and release the metals co-precipitated with it . . . so everything falls apart," said Francis.

"We are the first ones to show that these insoluble forms can be solubilized, especially under anaerobic conditions."

That discovery dates back to September 1983, when Francis, Dodge and former BNL Biology Associate Helen Quinby began visiting a reclaimed coal strip mine in West Virginia. Francis's team drew water samples from U.S. Bureau of Mines test wells there, being careful not to expose them to the air.

Back at BNL, that team of "anaerobic experts" used special equipment to study the samples — including a glove box filled with nitrogen to keep the air out. They succeeded in isolating an anaerobic bacterium — *Clostridium* — which was able to dissolve the metal oxides.

Clostridium has such unique abilities that the research team — which included Guest Scientist Krishnachetty Chendrayan from the Tamil Nadu Agricultural University in India — was awarded a patent for it in 1988.

But Francis doesn't think that *Clostridium* is unique, nor does he think it is only found at the West Virginia site.

"So far," said Francis, "we have looked at a number of different waste forms, and we are finding this kind of organism to be prevalent — contrary to the common belief that they are really isolated."

Although Francis's findings may be bad news for waste sites, Francis believes that they may also lead to a solution to the nationwide problem.

"Our purpose is to understand the basic mechanisms involved and, based on that, we can design a system which would be useful to clean up some of the waste sites," said Francis.

"We want to exploit the system to our advantage, to use it for cleaning up some of the metallic and radioactive wastes. That's our remedial concept." — Kevin Eber

EPA List (cont'd)

required for such actions at DOE facilities."

At the Landfills

In practices then considered routine, laboratory chemicals were disposed of at the Lab's former landfill until 1966. Limited quantities of radioactive material were disposed of in the landfills up to 1978. Problems affecting both landfills include iron, from the disposal of potable water treatment plant sludge, and tritium, a radioactive isotope of hydrogen, resulting from the disposal of low-level laboratory waste such as paper towels, mouse litter and sewage sludge, as well as the remains of laboratory animals — predominantly mice — used in medical experiments.

To prevent water from percolating through and leaching these substances into the ground water, and to comply with New York State regulations mandating closure by 1990 of certain landfills, BNL began the process, in 1985, of obtaining funding for capping the landfills. Over $7 million have been currently authorized by DOE for this purpose. Additional remediation may be required by the EPA as evaluation of the site progresses.

In addition to the landfills, Emma said, "There are also other Lab areas that need to be studied further and may require remedial action." These other areas include the Hazardous Waste Management Facility, an old ashfill, the Sewage Treatment Plant, and the Central Steam Facility. Including the landfills, the areas of concern add up to less than 50 of the Laboratory's 5,200 acres.

Aquifer Restoration Project

In the 1950's, 60's and 70's, degreasers containing the solvents 1,1,1-trichloroethane and tetrachloroethane were the products of choice for cleaning tools or unclogging drains. People throughout Suffolk County and at BNL used these products freely and disposed of them without restriction. Though the use, handling and disposal of organic solvents at the Lab has been subject to much stricter control since 1982, as a result of the earlier practices, these solvents have been observed in the ground water in some areas at BNL, as it has been in many locations in Suffolk County.

One location where these contaminants have been detected at BNL is near the Hazardous Waste Management Facility. This plume is being treated through the Aquifer Restoration Project, begun in 1986. Using an air-stripping technique, ground water is pumped to the surface, then sprayed into the air where the chemicals evaporate, and clean water returns to the ground. Levels of contamination have decreased significantly since the start of the cleanup, which has cost over $400,000 so far.

125 Monitoring Wells

BNL is aware of the degree of purity of its ground water because of the extensive network of 125 monitoring wells spread around the Laboratory site. BNL uses these wells not only to monitor the drinking water used on site, but also to assess whether any hazardous substances are affecting the water heading off site.

With 50 brand-new wells in operation and many others upgraded, this summer has seen a new round of ground water monitoring, accompanied by the start of the first phase of a new soil-sampling program. The Lab will spend a total of $1.7 million over the next few years to install more wells and completely upgrade its ground water monitoring program.

In conjunction with the Suffolk County Department of Health Services, BNL analyzes samples four times each year from 16 nearby private wells for tritium and other contaminants. Tritium attributable to BNL has been detected in some of these off-site drinking wells, but the levels are far below applicable drinking water standards.

"Though we have small quantities of some hazardous substances in the ground water," said Emma, "we want to see none. So we are working very hard to use less-toxic materials, or fewer of them, whenever possible. We're also developing better methods of waste management and eliminating sources of potential ground water contamination."

Upgrades and Prevention

As part of this program, BNL expects funds from DOE in fiscal year 1990 to upgrade the Hazardous Waste Management Facility with new handling and storage facilities and for removal of items currently in long-term storage at this facility. In addition, the Lab and DOE have committed to spend almost $2 million by the end of FY90 to eliminate potential hazardous discharges to cesspools at the Lab, and to upgrade aboveground and underground storage tanks to meet Suffolk County requirements.

Also with an eye on prevention, S&EP is now completing a training video on Hazardous Waste Management, which will soon be shown to all employees who handle hazardous substances.

Additional funds will be required to address the problems being caused by losses to ground water at the Sewage Treatment Plant, as well as the lingering effects of a 1977 spill of about 25,000 gallons of alternate liquid fuel at the Central Steam Plant. Though it was cleaned up at the time according to existing standards and approved by all appropriate agencies, samples taken about three years ago showed that some residue remains.

Thus, remediation efforts at the Lab have a long history. And whether or not BNL is included on the final NPL, said Emma, "There will be no change in our efforts to provide remediation. This just formalizes things." — Anita Cohen

Amateur Radio Club

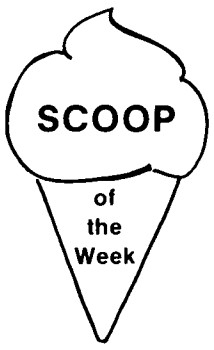
The BERA Amateur Radio Club will meet in the Management Information Systems (MIS) Conference Room, Bldg. 459, on Thursday, July 27, at noon. The agenda includes the progress of the conversion of the UHF repeater and various other upcoming club activities.

All licensed radio amateurs employed at the Lab may attend. Those who are interested in becoming licensed amateur radio operators are also welcome. For more information, contact Alan Bieber, Ext. 2928, or Bob Bacharach, Ext. 7790.

Camera Club

Darkroom procedures, a fall trip and a contest will be the topics at the next meeting of the next meeting of the Camera Club, to be held on Thursday, July 27, at 5:30 p.m. in the lounge of the Recreation Building. For more information, contact Lew Jacobson, Ext. 5193.

Scoop of the Week



For the scoop on "2-4-6-8 — Call When Problems Cannot Wait," Theresa Clark, Plant Engineering Division, is rewarded with the Scoop of the Week.

If you wish to enter the second annual Scoop of the Week contest, rush your news and feature scoops to the Bulletin, Bldg. 134, or call Ext. 5053. If you scoop the Bulletin's informed sources and a story based on your idea is published, you'll win an official certificate for soft-serve, frozen yogurt, redeemable anytime at the Cafeteria.

IBEW Meeting

Local 2230, IBEW, will hold its regular monthly meeting on Monday, July 24, at 6 p.m. in the Knights of Columbus Hall, Railroad Avenue, Patchogue. There will also be an afternoon meeting at 2 p.m. for shift workers at the union office at 31 Oak Street, Patchogue. On the agenda will be regular business, committee reports and the president's report.

Arrivals & Departures

Arrivals

John G. Bruce ..... Plant Eng.
Alan S. Fisher ..... Physics
Pamela E. Meehan ..... AGS
Stanley P. Sakry ..... Reactor
Edward J. Zeitler ..... NSLS

Departures

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

Robert J. Abruzzese .... Sfgrds. & Sec.
Michael C. Armijo ..... Biology
Clovis A. Linkous ..... Chemistry
Joseph D. Logan ..... Reactor
John F. Scott ..... NSLS
Michael I. Stuff ..... Instrum.
Jaroslaw W. Winniczek .... Chemistry

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Summer on Long Island
In Brookhaven Town

Brookhaven National Laboratory sits in the heart of Brookhaven Town — the largest of Suffolk County's ten townships. There's lots of land — a total of 253 square miles, lots of people — a 1987 population of 405,844, and lots to do. Below is a sampling of what the town has to offer, taken from the Brookhaven Town brochure, "This Summer in Brookhaven."

Sporting Events

- **5-Mile Mini Triathlon** — Holtsville Pool (1); Saturday, August 12, 9 a.m.; 1/4-mile swim, 1-mile run and 3¾-mile bike ride (your bike); $7 fee includes T-shirt; register by August 10; 475-4507.
- **Tennis Tournament** — Suffolk County Community College, Stony Brook University & Miller Place High School; Sat. & Sun., August 12 & 13; junior/adult singles, adult doubles; $5 fee; register by August 8; 475-6111.

Concerts at Bald Hill Cultural Park (6)

All programs are free (except on 8/30) and begin at 8 p.m.; rain dates are next day.

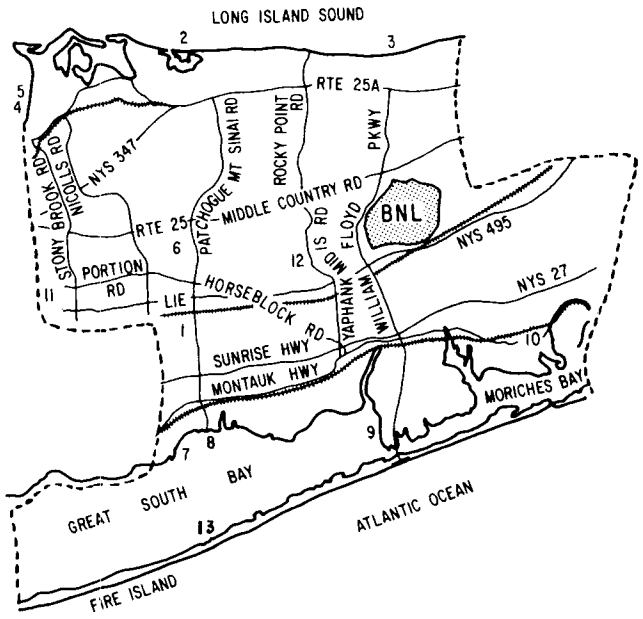
Monday, July 24 — **The Exquisites:** 50's & 60's rock & roll.
Wednesday, July 26 — **Sound Symphony:** symphonic pops & light classical.
Monday, July 31 — **Generation Gap:** 50's & 60's rock & roll.
Wednesday, August 2 — **Mike Toto Orchestra:** popular music, 1940's to present.
Friday, August 4 — **Brookhaven Theater Dance Guild's Dance Spectrum '89:** 10th annual dance performance.
Monday, August 7 — **Six Gun:** Country & western Wednesday,
August 9 — **Swing Syndicate:** 1940's music, swing-style.
Wednesday, August 16 — **The Naked Truth:** Top 40 music.
Wednesday, August 23 — **Big Band Association:** Big band music
Wednesday, August 30 — **Youth Bureau Summer's End Rock Concert:** featuring Brookhaven's best high school rock bands. Fee of $4; 654-7837.

Square Dancing at the Bald Hill Cultural Park Plaza (6)

Weather permitting, square dancing will be held from 8 to 10 p.m. every Friday through September 8, except for August 4. Call 732-4011 for cancellation information.

Brookhaven Town Beaches

Open through September 4; parking stickers available at all beaches.**



- **On the Ocean** — Davis Park on Fire Island (13), accessible by ferry from Patchogue, 475-1665; open 10 a.m. to 5 p.m.
- **On Long Island Sound** — Cedar Beach, Harbor Beach Road, Mt. Sinai (2); Shoreham Beach, North Country Road, Shoreham (3); Stony Brook Beach, Sand Street, Stony Brook (4); West Meadow Beach, West Meadow Beach Road, Stony Brook (5); open 10 a.m to 6 p.m.
- **On the Great South Bay** — Corey Beach, Corey Avenue, Blue Point (7); Sandspit, Brightwood Street, Patchogue (8) ; Shirley Beach, Westminster & Grandview Drives, Shirley (9).
- **On the lakes** — Kalers Pond, Montauk Highway, East Moriches (10); Lake Ronkonkoma, Shore Road, Lake Ronkonkoma (11) ; Yaphank Lake, Main Street, Yaphank (12).

** To obtain free parking permits:
- Permanent residents of Brookhaven Town should present their resident vehicle registration, plus driver's license, tax bill or voter registration.
- Temporary residents living on site should present copies of their automobile registration and license, even if they're from out of state, and a statement that they are employed at BNL, written on Lab stationary. Mail or bring to the Town of Brookhaven Parks & Recreation Office, 1130 Old Town Road, Coram, Monday-Friday, 9 a.m-4 p.m. The same letter can be used as proof of residency for participation in other events.

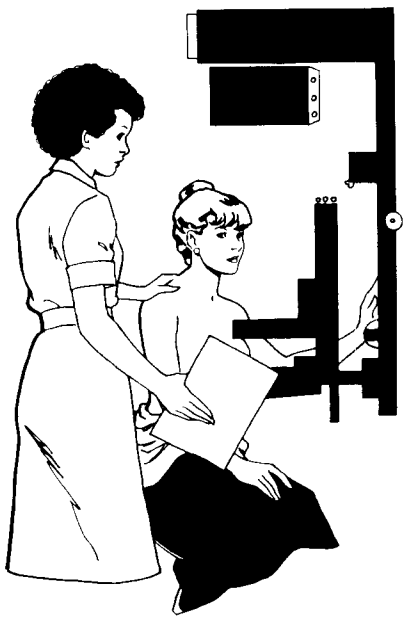
No-Cost Mammography on Site

The Occupational Medicine Clinic (OMC) now offers screening mammography examinations on site at no cost to eligible female employees.

About one woman out of ten will develop breast cancer during her lifetime, and the mammography x-ray examination has been found to be the best method of early detection of breast cancer. The American Cancer Society recommends that women have a baseline mammogram made between ages 35 and 40; that women age 40-49 have annual or biennial mammography; and that women over 50 have annual mammography.

Mammography at the Clinic is a screening test for women employees with no signs or symptoms of disease in the breast. Those female employees consulting the Clinic with existing signs or symptoms and those who have been treated for breast disease will be referred to private physicians for medical care.

For those who schedule a mammogram at the Clinic, OMC head physician Bryce Breitenstein advises that a brief physical examination should precede the mammogram. As with other x-ray exams, an order



written by a Clinic physician is required for a mammography examination. The x-ray procedure is performed by Radiology Technologist Nereida Gonzalez.

For more information about the Clinic's mammography screening program or to schedule a mammography appointment, contact the Clinic, Ext. 3670.

Equipment Demo

Looking Glass, a PC-based, color display panel, will be demonstrated by a representative of Chisholm on Wednesday, July 26, at 10 a.m., in the Computing & Communications Division seminar room, Bldg. 515.

Using a standard overhead projector, Looking Glass projects images from a PC monitor onto a large screen. It features a digitizing tablet for writing on the projected image, highlighting capabilities, use of an electronic pointer and some windowing effects.

Looking Glass is plug-compatible with IBM PS2/PC/XT/AT, compatibles, laptops, and Macintosh II/SE/512 Plus/512.

Special Invitation To Summer Visitors

You're invited to enjoy a trip to Six Flag's Great Adventure, in New Jersey, on Saturday, August 5. The modest cost of $25 includes bus transportation on a luxury air-conditioned coach; admission; six hours of fun at the amusement park and the safari; and a breakfast to be served on the bus.

The bus will leave from the Brookhaven Center promptly at 7 a.m. Seats are limited and will be allotted on a first-come, first-served basis. To reserve your seat, bring or mail your $25 — cash only — to Renée Flack or Duane Hinds, Bldg. 185A, Ext. 3316, no later than Friday, July 28.

Softball

Standings as of July 14

League I		League II	
Blue Jays	7-2	Cutting Edge	7-0
Phoubars	7-2	Magnuts	6-0
Cool'n Gang	5-4	CCD	4-5
Six Pax	5-4	Titans	3-5
Light Source	3-6	Scram	2-5
Ravens	0-9	Phase Out	0-6
		Bombers	unavail.

League III		League IV	
Dirty Sox	5-1	Snakebites	8-0
Scrambled Legs	5-1	Survivors	5-2
Blue Knights	4-3	Spacekadets	5-3
Medical	3-4	Simply Awesome	4-4
Cocoon	2-5	Hounds & Foxes	3-4
Sure Fire	1-6	Kidz-R-Us	3-4
		Foul Ups	1-6
		Farm Team	1-7

League V			
Sandboxers	6-2	Mudville Sluggers	4-3
The Far Side	6-2	Underalls	2-5
Source	5-3	Bat Ole Bat Magic	2-6
Seventh Inning Stretch	4-3	Turkeys	1-6

Cafeteria Menu

Monday, July 24

Soup: Chicken vegetable	(cup)	.75
	(bowl)	.95
Kielbasa & sauerkraut		3.10
Fish & chips		3.10
Lite-line: Roast beef au jus w/pot. or veg.		3.10
Hot deli: Turkey melt		2.85

Tuesday, July 25

Soup: Beef noodle	(cup)	.75
	(bowl)	.95
Buffalo wings		3.10
Fresh ham w/pot. or veg.		3.10
Lite-line: Julienne salad plate		2.85
Hot deli: Garden grilled cheese		2.85

Wednesday, July 26

Soup: Cheddar broccoli chowder	(cup)	.75
	(bowl)	.95
Spaghetti & meatballs w/garlic bread		3.10
Pork chops w/pot. or veg.		3.10
Lite-line: Antipasto platter		3.10
Hot deli: Ham & cheese twist		2.85

Thursday, July 27

Soup: Minestrone	(cup)	.75
	(bowl)	.95
California quiche		3.10
Roast turkey w/pot. or veg.		3.10
Lite-line: Apple-spinach salad		3.10
Hot deli: BBQ pork sandwich		2.85

Friday, July 28

Soup: Fish chowder	(cup)	.75
	(bowl)	95
Baked fish supreme w/pot. or veg.		3.10
Baked ravioli w/garlic bread		3.10
Lite-line: Broiled whitefish w/pot. or veg.		3.10
Hot deli: French dip		2.85

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 and/or appropriate bargaining unit, 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 Employment Manager, Ext. 2882.

SCIENTIFIC RECRUITMENT - Candidates may apply directly to the department representative named, or through the Office of Scientific Personnel, Ext. 7813.

ASSISTANT SCIENTIST - Experimental physicist to develop monochromators, other x-ray optic instrumentation and data acquisition system for a monochromatic computed tomography system, which will be developed on the X-17 superconducting-wiggler beam line at the National Synchrotron Light Source. Contact: A. Dilmanian, Medical Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

4085. TOOL & INSTRUMENT MAKER - (3 Openings) Central Shops Division.

4086. OFFICE SERVICES POSITION - Requires good knowledge of office procedures and excellent typing and communication skills. Will perform wide range of clerical duties such as maintaining files, ordering supplies, copying and distributing computer runs. Previous word processing experience desired. Budget Office.

4087. OFFICE SERVICES POSITION - Requires AAS or equivalent experience and previous IBM PS/2 word-processing and data-base software experience. Will be responsible for the typing, preparation for publication, distribution, control and maintenance of operating manuals. Previous graphics applications or desktop publishing experience helpful. Ability to obtain and maintain a security clearance required. Reactor Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

4088. ENGINEERING POSITION - Requires a BA or BS in instructional technology or several years' experience as an instructor at a nuclear reactor facility. Must be able to design, develop, conduct and evaluate general employee, emergency planning and other technical training programs. Must have experience with PCs, and good written and verbal communications skills. The ability to obtain and maintain a security clearance is necessary. Familiarization with INPO guidelines and/or DOE accreditation requirements and reactor operator certification are desirable. Reactor Division.

4089. STEAMFITTER A - Under minimum supervision, lays out, constructs, installs, repairs and maintains heat, steam and water distribution systems, related facilities and auxiliary equipment. (Reposting of Job #3051). Plant Engineering Division.

4090. SCIENTIFIC ASSOCIATE POSITION - Requires BS/MS in biochemistry, chemistry or physics and substantial experience with FORTRAN. Will assist in maintenance and further development of a beam line at the NSLS, running an active users' program and research in biological structure. Biology Department.

4091. ENGINEERING POSITION - Requires BS/MS in mechanical/electrical engineering or related field and 5-10 years' experience in design, test and operation of nuclear power plants. Knowledge of plant systems, and equipment testing and maintenance necessary. Duties include research and technical assistance in the areas of equipment aging, manufacturing, systems design and operations. Knowledge of PRA and reliability practices is also desired. Department of Nuclear Energy.

4092. NUCLEAR REACTOR OPERATOR TRAINEE - Requires AAS or equivalent experience in reactor operations, as well as demonstrated mechanical ability. Previous reactor experience desired, with naval reactor experience preferred. Ability to obtain and maintain a security clearance required. Must be able to work rotating shifts. Reactor Division.

4093. TECHNICAL POSITION - Requires AAS in electromechanical technology or equivalent and experience in electrical and control wiring, 480 Vac, and the design and installation of control circuits. The ability to work from prints, rough sketches and verbal instructions necessary. Responsibilities will include the hooking up and disconnecting of beam-line magnets. Previous electronics experience, as well as previous experience with public address systems, desirable. Alternating Gradient Synchrotron Department.

Motor Vehicles & Supplies

88 HYUNDAI EL GL - h/b, 3-dr.,red, 5-spd., p/w, sunroof, am/fm, 15k mi., good cond., asking $5,500. Ext. 4629 or 929-4258.

87 MAZDA 323 LX - 4-dr., a/t, a/c, p/s, am/fm cass., sunroof, 5-yr. service contract, $6,000. Linda, Ext. 3147 or 924-1038.

87 CAMARO - metallic red, T-top, am/fm stereo, mint, much more, $9,500 neg. 981-7471 until 11 p.m.

86 TOYOTA CAMRY - deluxe, 4-dr. sedan, 5-spd., a/c, 37k mi., available mid-Aug., $7,300. Les, Ext. 5180 or 751-7746.

86 FORD MUSTANG GT - good cond. in & out, $8,500. John B. Ext. 4028.

86 HYUNDAI GL - 22k mi., 5-dr., $3,800. Rich, Ext. 2965 or 744-0960.

86 YAMAHA RIVA 125Z SCOOTER - black, 1500 mi., excel. cond., $1,200 neg. Peter, Ext. 3977.

86 SENTRA - 5-spd., a/c, am/fm cass., new tires, fwd, $3,225. Park, Ext. 2788 or 331-1784.

85 RAM CHARGER - 4wd, a/t, a/c, hitch, new tires, 75k mi., runs well, $8,300. Ext. 2015.

84 HONDA AERO 125 MOTOR SCOOTER - 8k mi., new battery, good cond., very reliable, extras, $550 firm. Frank, Ext. 7519 or Vita, 277-0464.

84 EAGLE - 4x4, 4-dr. wagon, a/t, p/s, a/c, am/fm cass., 41k mi., good body & engine. 473-2473.

82 TOYOTA COROLLA - 2-dr., a/c, p/s, p/b, am/fm cass., sunroof, good cond., $2,500. Sahni, Ext. 3175.

82 PLYMOUTH CHAMP - Mitsubishi-made, black, am/fm cass. stereo, dependable, economical. Monica, 632-8663 or 689-7354 eves.

82 CHEVY MONZA - a/t, a/c, body good, runs well, asking $1,300. Denise, 473-5626.

82 DODGE ARIES STATION WAGON - standard trans., $575. 878-2577.

82 PONTIAC FIREBIRD - 6-cyl., a/t, p/s, p/w, p/b, a/c, stereo cass., mint cond. in/out, must see, $4,000. Larry, Ext. 3942 or 727-1412.

81 CHEVETTE - 4-spd., new water pump & timing belt, runs well, reliable, $350 neg. Bill, Ext. 2906.

81 DODGE RAM VAN - am/fm, a/c, custom interior, low mi., good cond., $3,400 neg. 821-9709.

81 PLYMOUTH RELIANT - 65k mi., a/t, am/fm cass., clean, asking $1,500. Ext. 3953 or 281-8274.

81 DATSUN 310 - 4-dr., 112k mi., runs well, good cond., $900. Jane, Ext. 3420 or 821-0429.

80 FORD FIESTA - 78k mi., good running cond., maintained, $450 neg. Frank, Ext. 3524.

80 DATSUN 210 - new clutch, head, brakes, & tires, 100k mi., runs well, $1,000. Mike , 924-2865.

80 BUICK SKYLARK - 4-dr., a/c, p/s, p/b, cass., $1,000 neg.; '79 Chevy Malibu station wagon, p/s, p/b, a/c, p/w, $1,000 neg. Ext. 3076.

80 CAMARO Z28 - a/c, p/w, 350 cu. in., very clean, garaged, orig. owner. 499-6341.

80 CHEVY MONZA - tan, 2-dr., 4-cyl., am/fm, p/s, good cond., $700. Helen, 475-4367 after 6 p.m.

80 JEEP J-10 PICKUP - 4x4, excel. running cond., 4 extra tires, $2,500 or best offer. 878-0516.

80 MAZDA GLC - 5-spd., s/t good tires, excel. transportation, $950. 744-1629.

79 FORD LTD - 2-dr., 8-cyl., 81k mi., a/t, p/s, p/b, a/c, clean in & out, $1,000. Lee, Ext. 3104.

79 OLDS DELTA 99 - royal, 4-dr., a/t, am/fm, full power, sunroof, runs well, good cond., $1,350. Sabek, Ext. 3919 or 3203.

78 HONDA HAWK MOTORCYCLE - 400cc, helmet, windshield, extras, orig. owner, $450 firm. Bill, 286-9097.

78 SLIDE-ON CAMPER - for pickup, 9½', 3-way refrig., heater, demand pump, hot water, toilet, stove, $1,000. Walter, Ext. 3457.

78 CHEVROLET SILVERADO C-30 - 4x4, all power, dual tanks, new paint, transmission & brakes, $3,500 neg. 744-6045 after 6 p.m.

Boats & Marine Supplies

31' HOUSEBOAT - bathroom, shower, galley, sleeps 5, remodeled, excel. cond., currently in use at Davis Park. Bob, Ext. 4660.

30' FIBERGLASS SAILBOAT - Grampian-Palmer eng., 3 jibs, 2 mains, keel, centerboard, instrumentation, extras, $16,500. 758-9818.

29' ULRICHSON - wood, fly bridge, fwc, 327, sleeps 5, elec. head, range//oven, refrig., many extras, asking $4,500. Jack, 732-2754.

22' CATALINA SAILBOAT - 3 sails, trailer, motor, good cond., asking $4,800. 929-8912 or 329-1743.

18' SOL CAT CATAMARAN - very fast, w/trailer, beach wheels, many extras, $2,000. Ext. 4008 or 821-0686.

16' BAYLINER - 1986, w/trailer, 85-h.p. Force outboard engine, 20 hours, marine radio, many extras, must see. 472-0430.

15' CORONADA DAY SAILER - ready for the water, w/trailer, $1,600. Steve, Ext. 3867 or 874-3729 after 6 p.m.

14' HOBIE CAT TURBO ROLLER - reefing jib, trailer, $1,600. Ext. 7657 or 924-2933.

14' BLUEJAY DAY SAILER SAILBOAT - w/trailer, needs some work, $495 or best offer. Frank D., Ext. 2022 or 399-4480.

12' ALUMINUM ROWBOAT - oars, anchor, best offer. 929-6744 eves.

12' SEARS MOTORBOAT - fiberglass skiff, w/6 h.p. Chrysler outboard, very good cond., asking $400. John Schuller, Ext. 3082.

ENGINE - Johnson, 110 h.p., outboard, new powerhead in '88, power t/t, oil injection, s/s prop., excel. cond., $2,500. 589-3072.

SNARK SAILBOAT - 2 sets of sails, $250; 3 walnut shelves, 3'x8½', $35; 2 pair ecru linen custom drapes, 184"w x 62"l, $50. 744-2314.

ENGINE - Mercury parts, lower unit w/new prop., 2 top ends. 722-4821.

OMC OUTDRIVE - excel. cond., $700; 19' Reinell hull, excel. cond., $300. Bart, Ext. 3457 or 924-6761.

Furnishings & Appliances

ROTISSERIE - Black Angus, large, good shape, $15. Mike, Ext. 2214.

DISHES - Heath Stoneware, for 6, extra pieces, design awards, shades of brown, $35. 286-0295.

LAMPS - living room, 2, good cond., $30. Bill, 924-1345.

GAS OVEN - Kenmore, 9 months old, orig. $900, sell for $199. Ron, Ext. 5502.

SOFA & LOVESEAT - early American, maple wood, pheasant print cusions, good cond., must sell, $100/both. Vita, 277-0464 or Frank, Ext. 7519.

LOVESEAT - camelback; pine huntboard; pine dining table; corner cupboard; rockers; chairs; dresser. Yvonne, 821-9089.

BEDROOM LAMP - Oriental, $40; oak bar chair, $50; horseshoe set, $10; Mimosa seedlings, $3; wrought-iron vanity chair, $12. Tim, 744-2203.

BENCHES - 2 deacon's benches, approx. 3' long, $95. Ext. 3953 or 281-8274.

FREEZER - Westinghouse, 19.6 cu. ft., upright, used 6 months, excel. cond., $300. Rich, Ext. 7519 or 696-2258.

TABLES - 2, smoked-glass top, brass, modern, excel. cond., $100/both. Kim, Ext. 4461.

SOFA SLEEPER - queen size, $200; stereo/audio cabinet, never used, $50. Doreen, Ext. 2456.

AIR CONDITIONER - White Westinghouse, 5,000 Btu, walnut-like front, runs well, used 5 seasons, $55. 751-0345.

AIR CONDITIONER - 1 year old, 1 year warranty, like new, 6,000 Btu, $300. Ernesto, Ext. 3869.

RECLINER - beige, $100. 286-0466.

BARBEQUE GRILL - electric, w/stand, $20; artificial Christmas tree, 7', $10. Shiue, Ext. 3372.

Tools, House & Garden

TABLE SAW - 10", heavy duty, w/extra blades, roll-around base, $150 or best offer. Fred, Ext. 4843.

COAL - approx. 1½ tons available, $75. Ext. 3953 or 281-8274.

GRILL - Weber, 24", charcoal kettle, $40; Gerry double umbreller stroller w/canopy, $80. Mark, Ext. 5350 or 369-0793.

AIR COMPRESSOR - 2 cyl., ¾ h.p., no oil, 125 Psi., 15 gal., 120/240V, H.D., $200. Bert, Ext. 3457 or 924-6761.

JET PUMP - 2", deep well, not old, w/glass-lined tank, $25/both. 924-6751.

ENGINE - Tecumseh, 6 h.p., vert. shaft, extra heavy duty, rebuilt, electric starter, $80. Dave, 447-2963.

CHARCOAL GRILL - Weber, red, good cond. Ext. 4449 or 751-8403 after 6 p.m.

Sports, Hobbies & Pets

PIANO - Wurlitzer console w/bench, medium wood, excel. cond., asking $900. Ext. 3857 or 751-3298 eves.

BMX BIKES - Haro freestyle, blue/green, diamond back; Harry Leary Turbo, black, $150/ea.; Sears Exer-cycle, orig. $130, sell for $65. 722-4821.

BIKE - 10 speed, 2 locks, pump, needs work, $45. Robin, Ext. 2420.

ELECTRIC GUITAR - Aria Pro II, Cardinal series, w/case, cord & amp, $220 neg. Steve, 751-2713.

BIKE - Raleigh Rampar, 10 speed, 27", lightweight, $180; 36" archery target, $20. Dave, 447-2963.

BICYCLE - 20", lay-back seat post, jelly seat, front & rear hand brakes, rear coaster brake. Ext. 5286.

BICYCLE - Ross, girl's, 24", light blue, 3 speed, excel. cond., best offer. Ext. 4449 or 751-8403 after 6 p.m.

GOLF CLUBS - Wilson, 1200LT, 3-PW, 3 woods & putter, $150. Ext. 2015.

PUPPIES - Pekingese, AKC, male/female. 654-1731.

WEIGHT-LIFTING SET - steel, barbell/dumbell set, w/bench, 130 lbs., $100. Frank, Ext. 2314 or 567-5131.

Audio, Video & Computer

CAMERA - Minolta X700, 35mm, w/flash and lens, $150. Emil, Ext. 4289.

TELEVISION - Sony, color, 19", good cond., $80. Ext. 3076.

STEREO CABINET - wood sides, glass top & front, rolling wheels, modern, good cond., $15; 5-panel room divider, natural, $35. Ext. 4461.

COMPUTER - 286AT, PC Limited, 8-6 MHZ, 1.2m, 360K, 30 mb hd, K.B. Herc. graphics, H. Res, mono, monitor, amber, $1,200. Charlie, Ext. 3950.

AUDIO RECEIVER - Pioneer SX-1600, 100 watt, w/5-band equalizer, $110; Dual turntable w/Ortofon cartridge, $60. Dave, 447-2963.

COMPUTER - Macintosh, 1 megabyte RAM, internal/external disk drives, $750. 289-8182 after 6 p.m.

Miscellaneous

TICKETS - Billy Joel, 4, guest lecturer, 7/31, L.I.U., Southampton campus, $20/each. Joan, 475-4792 eves.

Free

SHUTTERS - black, 6 pair; abestos shingles, white, 6 ea. Ray, Ext. 4561.

KITTENS - 2 black & white, about 2 weeks old. 475-5448.

KITTEN - female, tabby-colored, housebroken, sweet disposition, needs a home. Clare, Ext. 3438.

CAT - 1-yr., gray-striped, spayed, declawed, litter-trained; Old English Sheepdog, 3-yr., spayed, great disposition. Janet, Ext. 4049 or 928-0723.

Real Estate

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

For Rent

BELLPORT VILLAGE S. - 3 bdrm., 2 baths, furnished, Sept.-June occupancy, garage, $800/mo. + util. 286-9389 or 286-0466.

LAKE PANAMOKA - 2-bdrm. ranch, kit., d/r, l/r w/fp, w/d, walk to private lake, large property, 5 min. from Lab., Sept. 1 occup. John, 929-3407.

MANOR PARK - 4-5 bdrm. Colonial, fam. rm., partially fin. bsmt., pool, South Manor SD, 5 min. from Lab., possible option to buy, $1,250/mo. Roger, Ext. 3578, or Louise 395-1969.

MASTIC BEACH - 1-rm. studio cottage, new stove, just renovated, all utilities paid, $450/mo. Tom, 360-3803.

MASTIC BEACH - 2-bdrm. cottage, screened porch, fenced yard, very clean, nice neighborhood, $675 + util. 360-3803.

RIDGE - 3-bdrm. ranch, country kitchen, all appliances, new carpeting, 1½ baths, fenced-in yard, 5 min. from Lab, family neighborhood, $900/mo. Carol, Ext. 2673 or 744-8632 after 6 p.m.

RIDGE - furnished room, kitchen privileges, share bath, nonsmoker, $75/per week, 1 mo. sec., Aug. 1 occupancy. 929-4910 after 6 p.m.

SHOREHAM - SWR schools, 4-bdrm. Colonial, 2½ baths, l/r w/fp, den, new appliances, bsmt., 2-car gar., $1,300/mo. 744-1110.

STONY BROOK - 1-bdrm. apt., upper level, priv. ent., no children or pets. 689-7963.

CATSKILLS - 3-bdrm. chalet w/sleeping loft, fully furnished, great for hiking, fishing, rafting, near Catskill Game Farm & Hunter music festivals. Kay, Ext. 4501 or Bea, Ext. 3642.

HILTON HEAD, SC - 2-bdrm. condo, sleeps 6, 2 baths, tennis, golf, beach, pool, $425/wk., Sept. openings. Guy, Ext. 3147 or 585-9149.

FT. PIERCE, FL - mobile home, adult park, completely furnished, just bring toothbrushes, 2 bdrms., 2 baths w/showers & tubs. (407) 464-7102 or (407) 461-1226.

For Sale

AQUEBOGUE - split ranch, 3 bdrm., 2 baths, eik, din. area, l/r, deck, 0.6 acre, landscaped, ig sprinkler, fence, garage, OHW, a/c, cable, city water, $169,900. Beth, Ext. 3354 or 722-4750.

BELLPORT VILLAGE - 2-bdrm. ranch, attached garage, large living area, eik, 12'x20' screened patio, fenced rear yard, goldfish pond, many extras, $150,000 neg. 286-0795.

CORAM - Bretton Woods, 2-bdrm. condo w/many extras, clubhouse, golf, tennis, indoor/outdoor pool, $122,000 neg. Kitty, Ext. 3422 or 698-9166.

HOLBROOK - 3-bdrm. townhouse/condo, 5 appl., w/w, 1½ baths, tennis courts, swimming pool, clubhouse, balcony & fenced-in patio, 15-20 min. to BNL, $129,000. Ext. 2873 or 472-3236.

MANOR PARK - 4-5 bdrm. Colonial, 1½ baths, l/r, d/r, fam. rm., garage, ½ acre, South Manor SD, new roof & heat, many extras, slashed to $137,500. Roger, Ext. 3578 or 395-1969.

MASTIC - 3-bdrm. ranch, ¼ acre, 1½ baths, den, fin. bsmt., deck, appl., house fan, 3 ceiling fans, shed, fence, near school, shopping, 15 min. to Lab, asking $115,000. 265-2366 after 6 p.m.

MIDDLE ISLAND - Coventry Manor, 3-bdrm. townhouse, 2 full baths, kitch., l/r, d/r, laundry rm., 5 appl., ca/c, pool, tennis, asking $106,000. Rosalie, Ext. 3160 or 289-5704 after 5:30 p.m.

MIDDLE ISLAND - Lake Pointe, great neighborhood, 2 bdrm., l/r, d/r, w/w, w/d, ca/c, gas heat, wood deck, pool, tennis, asking $81,000. Bob, 924-7316.

MIDDLE ISLAND - 3-bdrm. ranch, 18'x24' great rm., l/r w/fp, d/r, eik, 1½ baths, skylights, i/g pool, sprinklers, deck, more, 5 min. to Lab., $166,900. 924-8426 eves.

MT. SINAI - brand-new, 3-bdrm. ranch, ½ acre, 2 baths, single car gar., carpeting, d/w, stove, refrig., 1989 taxes paid, immed. occup., $146,900. Bill, 878-4356 eves.

PORT JEFFERSON - 4-bdrm. Colonial, full bsmt., 2-car gar., 2 baths, ca/c, all oak floors, walk to harbor, village, mint cond., priced to sell. 474-1482 eves.

PORT JEFFERSON STATION - 3-bdrm. Colonial, l/r, d/r, den, eik, 1½ baths, 3 years old, gar., vinyl siding, fence, ig sprinklers, gas utilities, sewers, $164,990. 331-8459

ROCKY POINT - 3-bdrm. high-ranch, l/r w/brick f/p, cathedral ceiling, d/r, large kit., 2 baths, bsmt., ca/c, deck, 2-car gar. w/elect. doors, beach rights, 0.34 acre, $164,900. Kochman, 744-1057.

ROSLYN - 1-bdrm. co-op, corner, sunny, fully renovated, w/w, Roslyn SD. Ext. 3924 or 462-8205 eves. and 484-3897 weekends.

ST. JAMES - 6-rm. Cape, jalousie porch, l/r w/fp, eik, large rooms, gar., ½ acre plot, $162,500. 584-6729.

SHOREHAM - 4-bdrm., 2½-bath Colonial, 2,000 sq. ft., fenced, ⅓ acre, great neighborhood, 2-car gar., bsmt, energy efficient, low taxes, SWR, 15 min. to Lab., $175,000. Ext. 2965 or 744-0960.

SHOREHAM - Soundview Acres, contemporary ranch, 3 bdrm., 2 baths, l/r w/central brick f/p, bsmt., 2-car gar., deck, sprinkler system, steps to priv. beach, $199,000. 744-9746 eves.

FREEHOLD, NY - beautiful 5-acre plot, subdividable, near. 2 golf courses, skiing, 700' road frontage, 13 miles west of NY Thruway. 584-6729

Yard & Garage Sales

PORT JEFFERSON - moving sale, canopy bed, beds, chairs, desks, dressers, toys & books, Saturday, July 22, 2 Pilgrim Drive. 473-3616.

Car Pools

NORTHERN STATE - Exit 37 or LIE Exit 45, have 3, seek 1, easy off/on/park. Howard, Ext. 3766.

PATCHOGUE - van pool, seat open, leave name and number. Ext. 4669.

Wanted

SAILBOAT - Laser, any cond. Ext. 4008 or 821-0686.

CAMERA - 35mm SLR, body, lenses & accessories, good to excel. cond. Henry, Ext. 3817 or 874-2775.

DEHUMIDIFIER - Cheryl, Ext. 3586.

TOYOTA CAR - inexpensive, s/t, clean, 1980 & up. Ellen, 744-0354 eves.

WET SAW - for cutting bricks, buy or rent. Tony, 698-92274.

CAMERA - Canon AE-1 program body w/or without lens, preferably less than 4 years old. Henry, Ext. 3817 or 874-2775.

Ads left out of this issue due to lack of space need not be resubmitted to appear in the next issue.