BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Brookhaven All Aboard for the Maglev Initiative Engineered by Powell, Danby and Moynihan

In 1961, while he was stuck in traffic going over the Throggs Neck Bridge, BNL Senior Nuclear Engineer James Powell thought that there had to be a better way. So, sitting in his car, he thought, "Why not Maglev?" — which is short for magnetically levitated transportation.

In 1987, reportedly while he was stuck in air traffic on the Washington shuttle, U.S. Senator Daniel Patrick Moynihan from New York, who chairs the Senate's Environmental and Public Works Committee, also thought that there had to be a better way. So he came upon the idea for 300-mile-per-hour Maglev — which had been patented by Powell and BNL Senior Physicist Gordon Danby in the U.S. in 1968, but was taking off in Japan and Germany.

With an estimated construction cost of $10 million per two-way mile that can be paid for with private dollars, Maglev is a clean, efficient and high-speed transportation alternative for both people and cargo.

In 1991, following Moynihan's campaign to put America back on the Maglev fast track, the U.S. Congress appropriated $10.2 million for the National Maglev Initiative (NMI). President Bush's budget request for Maglev research is $19.5 million for 1992. A five-year total of $750 million for Maglev R&D has been proposed in the current Senate transportation bill.

Roger Stoutenburgh

New York State Lieutenant Governor Stanley Lundine gives the keynote address at the Maglev workshop held at BNL May 23-24.

With the goal of improving 21st-century intercity transportation by developing commercially viable and technologically advanced Maglev systems, this initiative involves the Federal Railroad Administration, U.S. Army Corps of Engineers, and the U.S. Department of Energy, in partnership with private industry, state government, universities and national labs such as Brookhaven.

As part of its involvement, BNL cosponsored a two-day workshop, May 23-24, on technology issues of superconducting Maglev transportation systems. A U.S. Department of Transportation northeast regional meeting on Maglev will be organized by BNL and held in Albany in October.

Along with the New York State (NYS) Energy Research & Development Authority and the NYS Institute on Superconductivity, the Lab hosted 60 leading Maglev researchers. They reviewed the current superconducting transportation technology, and identified engineering developments necessary for a second-generation Maglev to be made in America.

"BNL views Maglev as a technology spin-off from the likes of BNL's high-energy physics magnet program and the Grumann Corporation's aerospace program," explains BNL Senior Physics Associate James Wegrzyn of the Department of Applied Science, who co-chaired the workshop. "The current NMI funds are for assessment and planning, and BNL is particapating in this phase so that, in later years, the Lab can be positioned to apply for Maglev hardware research funds."

The concept of Maglev itself is a Brookhaven spin-off: In their spare time, Powell, who heads the Reactor Systems Division of BNL's Department of Nuclear Energy, and his co-inventor Gordon Danby, of the Alternating Gradient Synchrotron (AGS) Department, have been working on what they call their hobby since Powell's fateful car ride in 1961.

Working on the Railroad

"I sat for several hours and got to thinking of ways to move people at high speeds," Powell recalls. "In considering how to make a more efficient contact between a train car and rail, I thought, 'Why not suspend the train magnetically?' Since I had been working on applying superconducting magnets to reactors, I then thought, 'Why not use superconducting magnets to suspend the train?' "

In 1961, Powell was a DNE assistant nuclear engineer. Upon his return to the bachelor quarters that he was sharing with Danby, who was

(continued on page 2)

Acclaim for Maglev Inventors

Roger Stoutenburgh

Maglev inventors Gordon Danby (left) and James Powell with their Sparky Award statuettes.

With the renaissance of Maglev (see accompanying story), BNL Senior Nuclear Engineer James Powell and Senior Physicist Gordon Danby last month received both local and transcontinental recognition for their internationally acclaimed invention for magnetically levitated transportation.

Locally, the Long Island Forum for Technology (LIFT) presented Powell and Danby each with a 1991 Tech Island Award. The Maglev inventors captured two of the four Tech Island Awards given out this year to those "at the apex of technology leadership on Long Island."

The citation on the plaques awarded to Powell and Danby read: "For

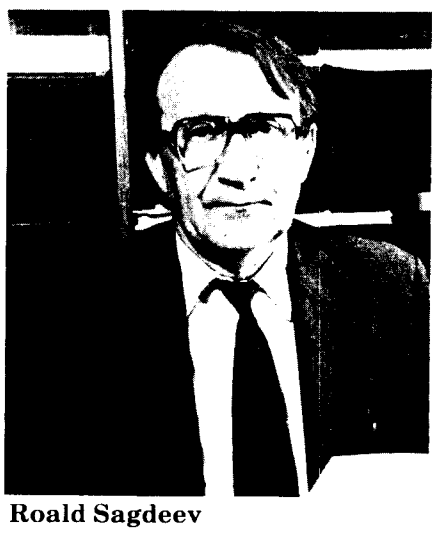
(continued on page 2)

AUI Distinguished Lecture
Big vs. Small in Space Science Programs

The first spacecraft carrying people — Vostok I piloted by Yuri Gagarin of the Soviet Union — was launched 30 years ago. Since then, the search for new discoveries in space has been a major endeavor of both the Soviet Union and the United States.

In their infancy, space science programs were modest in size, and comparatively small investments yielded big discoveries. To explore new horizons in space, however, many contend that more sophisticated equipment and expensive experiments are now required.

Physicist Roald Sagdeev, a Soviet expert in space science, will explore the issue of "Big vs. Small in Space Science Programs" in the third AUI Distinguished Lecture this year. On Monday, June 17, at 4:30 p.m., in Berkner Hall, Sagdeev will address the question: Is there still room for "small" science in space?


Roald Sagdeev

Sagdeev had a distinguished career as a physics researcher in the Soviet Union before he was named Director of the Institute of Space Research in Moscow in 1973, a position he held for 15 years. From 1988 to 1990, he was head of the theory division of that institute. He came to the U.S. in 1990 to take the position of Distinguished Professor of Physics at the University of Maryland at College Park.

At U.S.-Soviet summit meetings in 1985, 1987 and 1988, Sagdeev served as the advisor to Soviet President Mikhail Gorbachev on space and arms control. The Soviet physicist has won many awards for his scientific achievements, including the International Astronautical Federation Medal in 1986. He is also the author of several books on physics.

Associated Universities, Inc., began its lecture series 26 years ago. In the series, experts in fields as varied as science, economics and politics offer talks on issues that are of general interest to the public.

Coming Up

"Hereditary Cancer and Tumor Suppressor Genes" will be discussed during the next Donald Van Slyke Distinguished Lecture, to be given by pediatrician and cancer researcher Alfred Knudson Jr., of the Institute for Cancer Research at the Fox Chase Cancer Center in Philadelphia, Pennsylvania. The lecture will take place on Monday, June 24, at 8 p.m., in Berkner Hall.

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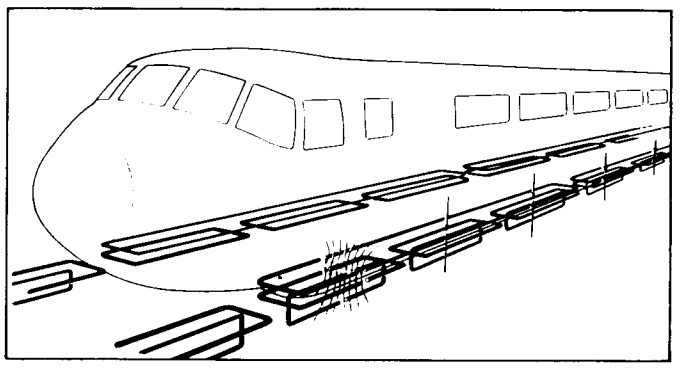
Susan Zevin, Director of the Eastern Region of the National Weather Service, will speak about "National Weather Service Modernization" on Thursday, June 27, at 11 a.m., in the seminar room of Bldg. 318. Her talk is sponsored by Brookhaven Women in Science.



A drawing from James Powell and Gordon Danby's 1968 U.S. Patent 3,470,828, showing a superconducting Maglev and its guideway.

Maglev (cont'd)

then an AGS assistant physicist, Powell shared his idea.

Working off and on for a considerable period of time, they invented electrodynamically stable levitation, in which very strong restoring forces automatically control any horizontal and vertical motion, restoring the vehicle to its desired position four to six inches from the guideway.

Like Repels Like

To move on air, or even in vacuum, Maglev uses the concept that like poles of a magnet repel each other and that opposite poles attract.

Each Maglev vehicle has a set of magnets, which levitate the fuselage above levitation loops in the guideway. These loops are not powered, except by induction from the passing vehicle. Never in contact with the guideway, a suspended Maglev vehicle rides along quietly. It is propelled by electricity, as a traveling magnetic wave is created by a linear motor winding in the guideway.

Maglev can use either conventional electromagnets or superconducting ones. Superconducting magnets are electromagnets, but their coils are lightweight and made of a material that loses all electrical resistivity at temperatures near absolute zero.

Powell and Danby prefer superconducting magnets for Maglev because the superconducting suspension lifts and automatically stabilizes the vehicle, with a large clearance, typically six inches, between the vehicle and its guideway. On the other hand, the electromagnetic suspension is not inherently stable and operates with a small clearance, typically 3/8 inch, thus requiring a very precise and expensive guideway.

The two scientists first presented practical Maglev to the world in a 1966 paper that Powell gave before the railroad session of the Society of Mechanical Engineers.

"We obtained the seminal patent in 1968, but everything exploded after that paper," remembers Danby. Never formally funded, the two inventors continued their theoretical and analytical work, publishing a dozen or so papers on the subject.

In 1967, U.S. Maglev experimental research began on a small scale and continued through 1975, involving private corporations, federal agencies, and academia.

In February 1975, however, the federal government derailed Maglev, redirecting its research funds to upgrading the railroads and completing the interstate highway system.

Orient Express

"The Japanese and Germans pressed on with Maglev R&D long after America gave up," says Danby.

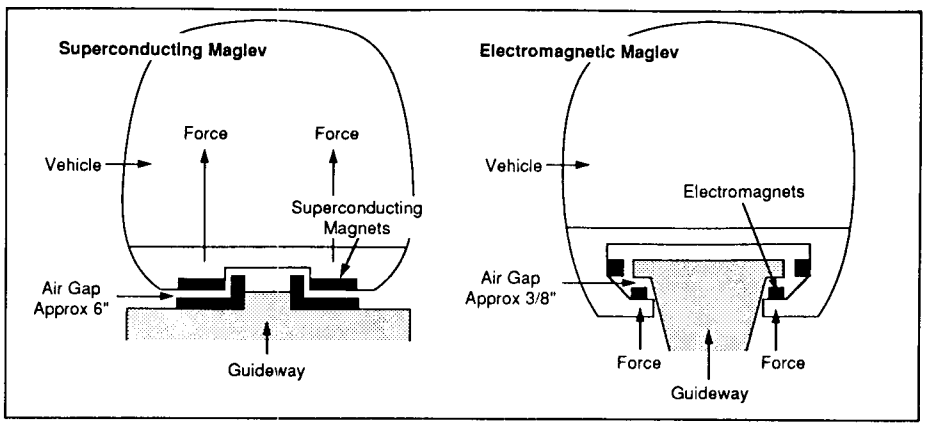
The Germans proceeded with the electromagnetic (EM) Maglev "because they decided it could be commercialized sooner," says Powell. "Though it will be ready within this decade, the German EM Maglev may be too late because Europe is already being tied together by high-speed rail." The German EM Maglev, called Transrapid, has gone 256 mph in tests.

The Japanese National Railway, on the other hand, already had a 130-mph bullet train by 1964, as an intermediate between conventional railroad and Maglev. So, in 1970, they gravitated towards Powell and Danby's superconducting electrodynamical invention, and, by 1980, successfully tested a 300-mph superconducting Maglev. Japanese industry is now planning to build several revenue-producing Maglev systems within that country.

"With our long distances and low population density compared to Europe and Japan, Maglev makes the most sense in the U.S.," says Powell. "So I think it would be a tragic mistake if the U.S. didn't commit to Maglev now."

The original U.S. basic Maglev patents have either expired or are due to in a few years. If the U.S. stands aside and if foreign competitors hold all the second-generation Maglev patents, then the U.S. will not be able to compete as a producer of Maglev systems in the future.

With U.S. airports and interstate highways overrun with traffic, Senator Moynihan realized that America needs an alternative transportation method that is not only less costly per mile and more energy efficient, but also environmentally much more acceptable.



While the Germans have developed an electromagnetic Maglev, the Japanese have a prototype of superconducting Maglev — the approach favored by James Powell and Gordon Danby.

After coming upon Maglev, Moynihan himself made a significant discovery: While there was no money or room to expand the aging interstate system significantly, the grassy rights of way running along both sides of an interstate were a national resource for Maglev.

If elevated about 40 feet to pass over existing bridges, Maglev could run alongside an interstate, in most locations, at an acceptable cost without interfering with highway operation.

Maglev's renaissance began in May 1989 with the Senator's convening the Maglev Technology Advisory Committee (MTAC), chaired by Powell and Danby, which reported to the Senate's Committee on Environment and Public Works chaired by Moynihan. The MTAC published an executive summary that June and will release its technical assessment this summer.

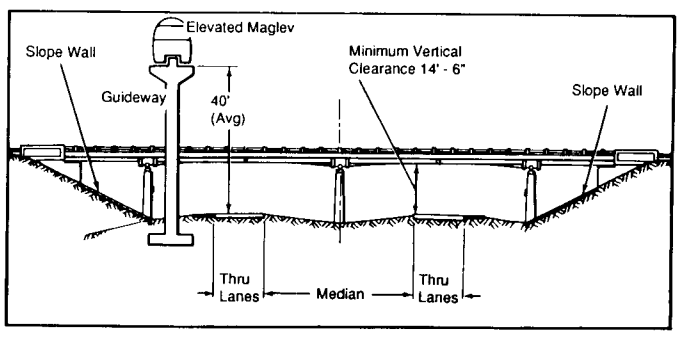
Highway vs. Great Train Robbery?

With the technology, real estate and possible funding finally available, a serious U.S. Maglev initiative now has a chance. "A real question is, 'Will the railroads, buses, truckers, highway construction companies, airlines and the like see Maglev as complementary or as a threat, and try to stop it?' " says Danby.

"Since Maglev is ideal for high speed transit between 100 and 600 miles, we see it as complementary to the existing system," explains Powell. "Because of their economic productivity at other distances, the need for the other modes of transportation will continue."

As Danby points out, two-way Maglev can carry the equivalent of ten interstate lanes. But, adds Powell, "The highways will always have to be supported by the government, while Maglev needs only government seed money to develop the concept with industry, to provide resources that no single company can afford, and to transfer the technology so that American industry can catch up with Japan. After that, Maglev will be self actualizing."

"Our job now is to spread the word on Maglev so a big system can get going in this country as soon as possible," concludes Danby. "Any practical second-generation system made in the U.S.A. that works is OK with us. We'd like to see it go — and be the first to ride it." — Marsha Belford



Stationed on interstate rights of way, an elevated Maglev would clear existing bridges and other structures, and would not interfere with highway traffic.

Inventors (cont'd)

advancing the well being of humankind through the devotion of professional expertise in science, engineering and technology, and bringing lasting recognition to Long Island as a center of innovation and technical excellence."

While the co-inventors had learned of their local honor in March, they were surprised with Oscar-like statuettes by the High Speed Rail Association at its annual international meeting, held May 7 in California.

The golden statuettes were the 1991 Sparky Awards, presented to Powell and Danby as the individuals who had contributed the most during the year towards furthering high-speed rail transportation for this country. They were specifically cited for their invention of superconducting electrodynamical suspension and propulsion, and pioneering of Maglev.

Powell joined the Lab in 1956 as an assistant nuclear engineer. In the course of being promoted to Nuclear Engineer in 1962, and to his present title as Head of the Reactor Systems Division in 1980, Powell made numerous contributions and received many patents for novel reactors such as accelerator breeder and particle-bed reactors.

His research also extended into other areas such as cryogenics and superconducting power transmission. Powell now specializes in conceptualizing and designing advanced fission and fusion reactor systems.

When Danby arrived at BNL in 1957 as an assistant physicist, he helped design, construct and test the AGS and its experimental beam apparatus. From 1961-65, he worked on the AGS experiment that discovered the muon-neutrino in 1962 and for which the 1988 Nobel Prize in physics was awarded to the experiment's three leaders, Leon Lederman, Melvin Schwartz and Jack Steinberger, all then of Columbia University.

After returning to accelerator physics, Danby was named Physicist in 1966 and to his present position in 1980. He has had long-term responsibilities for apparatus for the AGS and its experimental program, contributing many discoveries to the field.

Danby is now applying his expertise in the use of superconducting magnets for advanced accelerator and storage ring design to the construction of a muon storage ring. — M.B.

Inside Info

Otto White has been named Deputy Division Head of the Safety & Environmental Protection Division (S&EP), effective May 28.

In announcing White's appointment, S&EP Head Robert Casey noted, "He has the skills and knowledge that we need in this dynamic time, and I look forward to the leadership that he brings to this position."

White came to BNL in September 1974, as an associate industrial hygienist in S&EP. He became group leader of the Industrial Hygiene Group in August 1979 and was promoted to industrial hygienist in 1980. In July 1985, he was tapped to head S&EP's Operational Health & Safety Section.

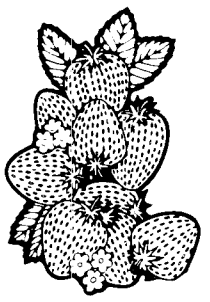
In addition to his S&EP responsibilities, White served as the Lab's Acting Assistant to the Director for Affirmative Action, from June 1988 to May 1989.

In Memoriam

Stephen M. Takats, who started at BNL in March 1947 as one the Lab's original firefighters, died on June 4. He was 75 years old and had retired from the Safety & Environmental Protection Division in 1981, after 34 years as a BNL firefighter.

Takats was a resident of Centereach. He is survived by his wife Anne, to whom he was married for 50 years; sons Stephen, Michael and Thomas; brother William; and six grandchildren.

Strawberry Fields Forever?



Strawberry fields aren't forever this year; in fact, they may not even make it through the weekend. So if thoughts of strawberries and cream or old Beatles' tunes have been haunting you, now is the time to get picking.

Long Island farmers say that the warm spring has considerably shortened the strawberry season. As a result, strawberries are getting smaller and harder to find everyday, but all is not lost. A few berries remain, and, if Mother Nature cooperates with cooler weather and light rains, the sweet-tasting fruit might even last into early next week.

Those worried about not finding enough berries can pick up all they want at the Mattituck Strawberry Festival tomorrow, Saturday, June 15, at the Mattituck High School grounds on Route 25.

For others who want to check out strawberry fields for themselves, the local growers listed below said they still have a few berries left for the picking:

Anderson Farms: Route 58, Riverhead. 727-2559 or 727-1129. Open 9 a.m. to 6 p.m. weekdays, 8 a.m. to 6 p.m. weekends. Berries $1 per quart; quart container 10¢. Picking is moderate.

John Berezny: Northville Turnpike and Sound Avenue, Riverhead. 722-3823. Open seven days a week from 9 a.m. to 5:30 p.m. Berries $1 per quart; quart container 10¢.

Fox Hollow Farm Stand: 143 Sound Ave., Calverton. 727-1786. Open 9 a.m. to 5:30 p.m., closed Wednesdays. Berries $1 per quart; container 10¢. A few berries are left.

Kenneth Glover: 633 Horse Block Road and Strawberry Lane, Brookhaven. 286-8721. Open 8 a.m. to 6 p.m.

Hodun Farms: River Road, Calverton. 727-2618. Open seven days a week from 9 a.m. to 5 p.m. Berries $1 per quart; container 10¢. Berries could last through weekend.

Fritz Lewin Farm: Corner of Sound and Edwards Avenues, Calverton. 727-3346. Open seven days a week 8 a.m. to 6 p.m. Berries $1 per quart. One quart container 10¢. Berries through weekend.

May's Farm: Route 25A, Wading River. 929-6654. Open seven days a week from 8:30 a.m. to 6 p.m. Berries 87¢ per pound; container sold for a nominal fee.

Young's Orchard: 54 Sound Avenue, Riverhead. 727-5363. Open Tuesday-Sunday, 7 a.m. to 6 p.m. Berries 75¢ per pound; quart container 15¢. Picking is still good.

Gym Closing

The gymnasium and weight rooms will be closed during the week of June 17-21, Monday through Friday, for BNL's Summer Blood Drive. Thanks in advance to all for cooperating for this worthy cause. The pool and locker rooms will remain open.

Technical Seminar

Varian Vacuum Products will offer a seminar on ultrahigh vacuum (UHV), on Thursday, June 20, from 9:30 to 11:30 a.m., in the Snyder Seminar Room, Bldg. 911A. The seminar will cover UHV definition and characteristics, system design, ion and sublimation pumping, and pump and system troubleshooting.

Arrivals & Departures

Arrivals

Eric J. Kahn.....Plant Eng.
Kenneth B. Kim.....Plant Eng.
James T. Rose.....Accel. Dev.
Daniel F. White.....Accel. Dev.

Departures

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

Noorallah V. Gillani.....App. Science
Danny J. Mangra.....AGS

Scoop of the Week

So, starting next Friday, with the coming of the summer solstice at 5:19 p.m., and continuing throughout the summer season, the Bulletin will be trading ice cream and frozen yogurt for hot tips in the fourth annual Scoop of the Week contest.

If you can scoop all of the Bulletin's informed sources with a hot tip — an idea for news or a feature — and if the Bulletin publishes a story based on your idea, the editor will award you a Scoop of the Week — a certificate for a free ice cream cone, sandwich or pop, or a cone of soft-serve, frozen yogurt with toppings.

This year, the scoops are courtesy of the Service America Corporation, which operates BNL's Cafeteria and concession truck. Also starting this year, Scoop of the Week certificates may be redeemed either at the Cafeteria or from the ice cream truck.

With a supply of ice cream, soda and chips, the ice cream truck has begun making rounds during the summer from 11:30 a.m. to 4:30 p.m. or until 7 p.m. on the evenings of softball games. To schedule the ice cream truck to stop at your building during afternoon breaks, contact Cafeteria Manager Chris Fautus, Ext. 3541.

So, rush your news and feature tips to the Brookhaven Bulletin, Bldg. 134, or call Ext. 5053. If your idea results in a Scoop of the Week, your name will be announced in the Bulletin and you will be sent an official certificate, suitable for framing or redeeming.

Golf Tournaments

The BGA will hold its second golf tournament of 1991 on Friday, June 28, on the red course of Bethpage State Park Golf Course. A few tee-times remain for non-BGA members who wish to join. Contact tournament starter John Millener, Ext. 3853, for more information on available tee-times. The greens fees are $15 for all New York State residents.

Seventy-six BNL golfers teed up at the year's first outing at Heatherwood, on May 16.

Flight	Low Gross	Callaway Low Net
A	Les Lawrence	Mike Losquadro
B	Larry Musso	Joe Mayeski
C	Bob Schuman	Glaister Fraser
	Young Park	George Dioguardo
		Don Horne
D	Bill Cahill	Gene Hassell
		Paul Poleski
		Paul Roman
E		Jim Marsch
		Ernie Tucker

Closest-to-the-pin awards were taken by Artie Dick, Tony Krupien, Charlie Lotridge and Lou Sanford, while Les "Bam-Bam" Lawrence won the longest-drive-award twice.

The four-person scramble will be held on Monday, July 1, at the Timber Point Golf Course. Next week, notices will be in the mail, and more information will appear in the Bulletin.

Public Sale Of Motor Vehicles

Forty-three (43) vehicles are being made available for public sale. They can be inspected on Wednesday, June 26, and Thursday, June 27, from 9:30 a.m. to 3 p.m. at Warehouse T-87.

They will be sold at a public auction on Friday, June 28, at Berkner Hall, starting at 10:30 a.m. For further details, call Ext. 2302 or 4599.

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It's Not Too Late to Pledge

During the Fourth of July weekend, many employees will be celebrating this country's Declaration of Independence in a Long Island fashion — at a backyard barbecue or a beach party. Few, however, will be contemplating their dependence on donated blood — unless an emergency need arises.

Since medical emergencies requiring donated blood arise more often during holiday weekends than regular weekends, Long Island Blood Services is asking BNLers to pledge their blood before the Fourth.

So, if you haven't returned your pledge card for BNL's Summer Blood Drive on Tuesday through Thursday, June 18-20, it is not too late to get an appointment to go to the gym and donate blood on one of those days between 10 a.m. and 3 p.m.

To make a better-late-than-never appointment, simply call Blood Drive Chair Susan Foster, Ext. 2888. Your allegiance to the Blood Drive cause is appreciated.

BERA Trips

For more information about the following trips, call Louisa Barone, Ext. 3347; Rosalie Piccione, Ext. 3160. or Kay Dellimore, Ext. 2873.

Philadelphia & Washington, D.C.

BERA will sponsor a two-day, one-night trip to Philadelphia, Pennsylvania, and Washington, D.C., on Saturday and Sunday, September 21 & 22. The price of $90 per person is based on double occupancy and includes round-trip transportation by air-conditioned motor coach; an overnight at the deluxe West Park Hotel in Tyson's Corner, Virginia, on the outskirts of Washington, D.C.; two escorted tours; and a complete Chinese luncheon on Sunday.

The bus will leave the BNL Center promptly at 8 a.m. that Saturday. On arriving in Philadelphia, the group will tour Independence Square, the Liberty Bell, Old Congress Hall, Luray Caverns and the Car & Carriage Museum, before continuing on to Virginia.

Sunday's tour of Washington D.C. will include the Jefferson Memorial, Lincoln Memorial, White House grounds, Awakening, Air & Space Museum, and the U.S. Capitol. Time permitting, this tour will also visit the Kennedy Performing Arts Center, Watergate and the U.S. Army Museum. The bus will return at approximately 11 p.m. on Sunday.

A limited number of reservations are available on a first-come, first-served basis, so sign up now at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 2 p.m.

Atlantic City

There are still a few seats left for the BERA-sponsored bus trip to Atlantic City's Trump Castle Hotel & Casino on the Marina, on Saturday, June 29. The one-day trip will initially cost $20, but the hotel/casino will give a $10 coin return, $4 towards food or $2 extra coins and $5 deferred voucher.

Tickets are on sale now at the BERA Sales Office. Participants must be at least 21 years old. The bus will leave the Brookhaven Center promptly at 9 a.m. and return about 11:45 p.m., with an extra pick-up at LIE Exit 63 if necessary.

Cricket Club

The Brookhaven International Cricket Club has scheduled a match against the Staten Island Cricket Club on Saturday, June 29, at 1:30 p.m. For further information, call Dave Cox, Ext. 3818, or John Millener, Ext 3853.

Soccer Club

The Soccer Club has expanded its play schedule: Pick-up games are now played at the BERA soccer field Mondays at 5 p.m., Tuesdays at noon, Thursdays at noon, and Fridays at 5 p.m. Everyone is welcome. For more information, call Enrique Abola, Ext. 4383.

Software Demo

ASYST, the Data Acquisition Software Group of Keithley Metrabyte, will be in Berkner Hall on Tuesday, June 18, from 10 a.m. to 2 p.m. with three current point-and-click PC programs.

The comprehensive VIEWDAC uses 386/486 in a windows interface for multitasking, and for arrays up to max RAM or hard disk. The tool kit EASYEST LX expands ASYST's single-screen, icon-driven EASYEST for setting up, testing and troubleshooting of data-acquisition systems.

Mountain Club

On Friday evening, July 12, Mountain Club members will drive to Woodland Valley campground for the weekend. The campground is near Phoenicia in the Catskills and boasts lots of outdoor activities. For instance, rent tubes in Phoenicia to go tubing on the Esopus River. Or enjoy trails for hiking or mountain bikes. Or, just sit by the little river that runs through the Woodland Valley campground. The club must make reservations for camp sites early, so if you are interested, call Tom Clifford, Ext. 7115.

Note to Employees:

Attendance at lectures, meetings and other special progams held during normal working hours is subject to supervisory concurrence.

Cafeteria Menu

Monday, June 17

Soup: Vegetable barley	.75/.95
Entree: Grilled beef liver w/onions & 1 veg.	3.10
Entree: Stuffed shells w/spaghetti sauce & 1 veg.	3.10
Fitness: Oven broiled fish amandine & 1 veg.	3.10
Carvery: Hot Pastrami sandwich	2.85
Grill: Fried fish sandwich w/french fries	2.85

Tuesday, June 18

SPICE: Top your own yogurt	
Soup: Navy bean	.75/.95
Entree: Pork fried rice w/1 veg.	3.10
Entree: Vegetable quiche w/1 veg.	3.10
Fitness: Chef's choice	3.10
Carvery: Hot roast beef sandwich	2.85
Grill: Monte Cristo w/ French fries	2.85

Wednesday, June 19

Texas round 'em up special

San Antonio chili bean soup
Cowpuncher's barbecue
Bronco bacon & cheese dog
Trailside lunch platter

Carvery: Hot Black Forest ham sandwich	2.85

Thursday, June 20

Soup: Vegetarian vegetable	.75/95
Entree: London broil w/mushroom gravy	3.65
Entree: Kielbasa & sauerkraut w/ 1 veg.	3.10
Fitness: Chef's choice	3.10
Carvery: Hot corned beef sandwich	2.85
Grill: Grilled pastrami w/French fries	2.85

Friday, June 21

Soup: New England clam chowder	.75/95
Entree: Spaghetti & meatballs	3.10
Entree: Macaroni & cheese w/1 veg.	3.10
Fitness: Catch of the day w/1 veg.	3.10
Carvery: Hot turkey sandwich	2.85
Grill: Fried clams on bun	2.85
Breakfast w/coffee, 7:30 - 10:30 a.m.	2.65

Mon.: 2 eggs, bacon & pancakes
Tue.: Western omelet, French fries, toast
Wed.: Spanish omelet, home fries, toast
Thu.: 2 eggs, bacon, cheese on croissant, fries
Fri.: French toast, 2 eggs, bacon, home fries

Classified Advertisements

Placement Notices

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

Each week, the Personnel Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Personnel, and, second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (282-7744), for a complete listing of all openings.

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

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

MK108/SC. MACHINE TOOL REBUILDER - Central Shops Division.

DD 0680. SECRETARIAL POSITION - (term position) Requires AAS in secretarial science or equivalent experience, and excellent oral and written communication skills. WordPerfect experience is also required; IPAP experience helpful. Responsibilities will include processing DOE and NRC proposals, daily distribution of computer runs and general secretarial duties. Budget Office.

DD 5521. OFFICE SERVICES POSITION - Requires AAS or equivalent, experience with PCs, and knowledge of Laboratory policies and procedures. Responsibilities will include, but are not limited to, participation in various manual and automated processing of data related to the following areas: procurement, property management, invoice processing, and service recharging. Will be involved in file downloading, data entry, report processing and distribution, and document filing and archiving. Experience in these areas highly desirable. Computing and Communications Division.

Motor Vehicles & Supplies

87 SUBARU GL 10 WAGON - 4wd, 36k mi., a/t, ac, am/fm cass., roof rack, warranty, etc., excel. cond., $6,000. Tom, 434-9345.

87 NISSAN MAXIMA - fully equipped, $8,000. Bob, Ext. 7785.

87 ISUZU TROOPER 4x4 - ac, luggage rack, running board. 399-4897 after 6 p.m.

87 TOYOTA HILUX PICKUP 4x4 - 4 cyl., 5-spd., fiberglass cap, bedliner, halogens, heavy-duty shocks, mint cond., $6,100. 727-2818.

87 IROC-Z CAMARO - a/t, loaded, all power, T-tops, alarm, garaged, 35k mi., immac. cond., $8,900 666-5654.

87 NISSAN STANZA GXE - 4-dr., ac, a/t, p/s, p/b, loaded, 71k mi., v.g. cond., $4,400. Ext. 2610 or 924-5272.

86 CHRYSLER NEW YORKER - 4-cyl., turbo, 4-dr., white, leather int., voice alarms, digital dash, all avail. opt., $6,000. Jim, Ext. 4040 or 289-0876.

86 MITSUBISHI MIRAGE - 3-dr. h/b, a/t, 91k mi., excel. cond., asking $1,700. Ext. 7505 or 689-8605.

86 ISUZU PICKUP - 4wd, 77k mi., 38k mi. on the eng., LS pkg., excel. cond., $4,800. Lloyd, Ext. 3163 or 286-1024 after 6 p.m.

86 CAMARO - V-6, ac, p/s, p/b, 59k mi., $4,900. Jim, Ext. 7669 or 878-9309.

85 HONDA MAGNA V30 MOTORCYCLE - 500cc, 65-h.p., 10k mi., black, w/helmets, $1,000. Ext. 4662/7870 or 286-0263.

85 TRANS AM - T-top, loaded, gar., maroon, tinted windows, all hwy. mi., immac. cond., must sell, $6,500 neg. Sharon, Ext. 2689 or 698-2798.

85 OLDSMOBILE CUTLASS SUPREME - 2-dr., p/s, p/b, more, $4,500; '81 Cadillac Sedan deVille, loaded, $2,450. Ext. 4965 days or 475-8242 eves.

85 PEUGEOT 505-STI - ac, sunroof, spoiler, factory alum. wheels, 5-spd., 29 mpg, high mi., $3,200 or best offer, excel. cond. Ted, Ext. 4284.

84 BUICK REGAL - 40k mi. on new Goodwrench engine, new trans. & exhaust, ac, all power, $2,000. Frank, Ext. 4284.

83 TOYOTA CAMRY - 4-dr., 5-spd., ac, am/fm, reliable, must see, $1,500 neg. Ext. 2369.

83 PLYMOUTH - turbo, new head gasket, carb. & pan gasket, 64k mi., am/fm cass., good cond., asking $900. Ext. 7238.

83 MAZDA RX7 GS - gray w/black int., sunroof, new engine, ac, p/s, p/b, a/t, $3,750. Ext. 4139.

82 OLDS CUTLASS - V-6, a/t, ac, p/b, p/s, am/fm stereo cass., 89k mi., runs well, good cond., $1,500. Chris, Ext. 4234/3191.

82 DODGE CAMPER VAN - 89k mi., heater, refrig., extras, excel. cond. 924-6129.

81 OLDSMOBILE OMEGA - 2-dr., fwd, a/t, ac, p/s, p/b, am/fm, new tires, battery, muffler, brakes, runs well, $1,000. Yang, Ext. 2341.

81 PLYMOUTH RELIANT - 79k mi., white/red int., a/t, new brakes, struts & exhaust, more, nice tight car, asking $1,100. Ext. 7014 or 281-8274.

81 PLYMOUTH CHAMP - 1.6l, 4-spd., recent paint, clutch, tires, high mileage, well maint. Bruce, Ext. 4179.

80 YAMAHA XS-650 SPECIAL - orig. owner, needs nothing, $1,000 firm. Greg, 399-1258.

80 SUZUKI GS 1000 MOTORCYCLE - blue/white, low mileage, classic, excel. cond., asking $2,100. 654-2214.

79 CHRYSLER NEW YORKER 5th AVENUE - p/w, p/l, 70k orig. mi., $1,500. Ext. 4247 or 473-8292.

79 JEEP CHEROKEE - 4wd, a/t, ac, RR, $1,500. 878-1178.

79 TRIUMPH - convertible, excel. cond., $3,295. Alice, 878-4408.

79 SHASTA CAMPER - 7 bunkbeds, hitch, micro, awning, good cond., asking $3,900. Bill, 589-2664.

79 MONTE CARLO - landau, V-8, ac, 95k mi., dependable transportation, asking $1,500. 363-6940 after 5 p.m.

78 CHEVY VAN - reliable transportation, some body rust, good tires, 60k+ miles, $500. Cheryl, Ext. 5061.

78 DODGE RV - 18½', self-contained, good cond., great for 2 adults & 2 children, $5,190. 727-7741.

76 PURITAN CAMPER - 19', appliances & mechanics good, needs interior work, best offer. John, Ext. 7623.

70 & 69 VW KARMAN GHIA - complete w/engines, good for restoration or parts, good glass, you pick up, make offer. Henry, Ext. 5110.

69 CAMARO RALLY SPORT - classic car, $3,500. Jim, Ext. 3372 or 821-0250.

57 CHEVY - 4-dr., hard-top, turq. & white, a/t, 6-cyl., 38k orig. mi., new paint, interior, bumpers rechromed, $11,000. Ken, Ext. 5110.

31 CHRYSLER MODEL B - 2-seater, rumble seat, all orig., excel. cond., must see, asking $7,500. Ext. 3160 or 289-5704 after 5 p.m.

BEDLINER - for Chevy S10 long-bed, best offer. Richie, Ext. 5317.

BUMPER - rear-towing, for Ford full-size pickup truck, $35. Tom, Ext. 4507 or 878-1060.

TOW BAR - 43", Valley #7452, new, $75; trunk-mounted bike & luggage rack, $20. Tony, 269-9510.

TRAILER DOLLY - 2" ball, perfect for moving trailer around yard w/out tow vehicle, $25. 473-6546.

Boats & Marine Supplies

25' MARK TWAIN - 1984, aft cabin, 260-h.p., new outdrive & canvas. Alice, 878-4408.

22' CATALINA SAILBOAT - 6-h.p. Johnson, new mainsail & tiller, trailer, $4,250. Barbara, 929-8912.

21' BEACH CRAFT - 1989, center console, w/1990 225-h.p. Evin., trailer, $21,995. Alice, 878-4408.

20' CHRIS CRAFT 205 LTD - 1988, Bowrider, 6-cyl., i/o, 8' beam, am/fm, shore trailer, many extras, $15,500. Bill, 732-8793.

18' SOL-CAT CATAMARAN - trailer, beach wheels, $1,200; 25' Morgan sailboat, recent ob. & sails, creative financing. Steve, Ext. 4008 or 821-0686.

17' VENTURE SAILBOAT - s/keel, extra Genoa, 6-h.p. motor, rubber dinghy w/elec. motor, extras, sleeps 4, $1,995. P. Hein, Ext. 3962 or 821-6256.

16' BOWRIDER - 65-h.p. Johnson, tilt trailer, p/winch, $1,900. Jim, Ext. 3372 or 821-0250.

16' GARVEY - flat-bottom clamboat, fiberglass over wood, need to sell, make an offer. Dave, Ext. 7870/4662 or 286-0263.

14' HOBIE CATAMARAN - roller reefing jib, trailer, v.g. cond., $1,600 or best offer. Ext. 7657 or 298-9560.

8' NORLANTIC - inflatable, used one season, like new cond., no engine, $700. DJ, Ext. 7643.

STEERING ASSEMBLY - complete w/steering head, cable & steering wheel, for 17' & 18' boat, $75. Anthony, 269-9510.

MOTOR - 9.5-h.p. Evinrude, short-shaft; trailer for 12'-14' boat. Michael, Ext. 2081 or 878-9384.

TRAILER - no rust, galv., approx. 14' for light boat, must see, sells for $400 new, asking $125. Bob, Ext. 3509 or 289-9533.

Furnishings & Appliances

AIR CONDITIONER - GE, 14,000 Btu, 115 volts, works well, $50. 588-2477.

AIR CONDITIONER - GE Carry Cool, 5,000 Btu, $125. 331-1754.

SEWING MACHINE - Singer, antique, treadle type, works, asking $125. Annamarie, 473-9016.

BEDROOM - dresser, hutch, end table, headboard, desk, dark pine, good cond. Ext. 3334 or 744-2404.

RECLINER - good cond., $50 or best offer; sofa bed, good cond., $125. O. Booker, Ext. 3082 or 727-5912.

DINING ROOM - solid light wood, 60" table w/leaf, china cabinet, buffet, 6 chairs, $100. 744-3004.

DINING ROOM - antique, table w/built-in leaf, 6 newly recov. chairs, server, china closet, $500; Quazel dining room chandelier, $50. 929-5840.

MAPLE CHEST - 5 drawers, $30; wicker child's potty, needs repair, $20; old mission oak plant stand, $15. 475-4199.

MICROWAVE OVEN - Sharp Carousel, rarely used, asking $190. Veronique, Ext. 3396.

RUG - Persian, 6'x9', beige w/brown & white trim, purchased in Italy, excel. cond., must see, $70. Cynthia, 286-6305.

SHAMPOOER - & steam cleaner, Kenmore, paid $250, now $100; large window fan, $20. Ext. 5320.

TWIN BEDS - 2, w/boxsprings & mattresses, clean, $50/both. Tom, Ext. 4507 or 878-1060.

VACUUM - Hoover Concept 2, orig. $250, sell for $50. Ext. 2534.

Tools, House & Garden

DOOR - exterior, wood lower, glass top, 32", hinged right, $20. 473-6546.

GARDEN FOUNTAIN - cascading, 3 tiers, w/pumps, $250. 744-4611 after 6 p.m.

LAWN MOWER - Snapper, 3½ h.p., 21" cut, rear bag, $125. Dan, Ext. 4987 nights or 698-7322.

RIDING LAWN MOWER - Sears, 10 h.p., rear bagger, used one season, 30" cut, excel. cond., $800. Pam, Ext. 7286 or 581-7656.

SHOP EQUIPMENT - Shopsmith Mark V table saw, drill press, lathe, disc sander, accessories. Tom, Ext. 5350.

Sports, Hobbies & Pets

BASEBALL CARDS - Sets & Stars collection, 1970-90, excel. cond., $6,000. 475-5399 after 6 p.m.

BIRD CAGE - very large, wrought iron, free standing, cost $350, sell for $100. Ext. 2886 or 929-4850.

CAMERA - Canon T-70, 50mm/1.4, 28-55mm and 80-200/4mm zooms, 277T flash, 2x extender, case, $575. Witkover, Ext. 4607 or 368-0452.

CAMERA - Canon A-1, 2 zooms, 2 lens, Cokin filters, case, flash, etc., $500; Celestron C-90 spotting scope $250. Tom, 434-9345.

CLARINET - Signet, wood, excel. tone, $250. Jim, Ext. 3372 or 521-0250.

KAYAK - used touring, 13'6", plastic, w/paddle & spray, good cond., $300. Ernie, Ext. 2957.

PARAKEETS - 2, lovely, large white Hoei cage, all equipment, $45. Ray, Ext. 3680.

ROOF RACK - for small car w/gutters, 2 bicycle holders, can hold skis or windsurfer, $35. Steve, Ext. 7570.

ROWING MACHINE - $50; skis, poles, size 8½, $50; toboggan, $30; convection oven, $30. 399-4897.

ROWING MACHINE - good cond., $75. H.Z. Martin, Ext. 3487.

SOFTBALL GLOVE - Wilson, like new, left hand, $20. Sydell, Ext. 3389 or 727-6385.

WEIGHT LIFTING SET - w/new bench, $65. Tom, Ext. 4507 or 878-1060.

WOOD-BURNING STOVE - Heritage, 24"d x 30"w, pipes included, good cond., asking $500. Evelyn, 698-3414.

Audio, Video & Computer

COLOR TV - 13", excel. cond., $60. Ext. 7505.

COMPUTER - IBM PC, two 5¼ disc drives, monitor, keyboard w/coprocessor, good for beginner, $300. Bob, Ext. 5010 or 289-2986.

COMPUTER - Commodore 64, 1541 disk drive, 1902 color monitor, lots of software, $450. Ext. 4965 or 475-8242 eves.

MASTER SYSTEM - Sega, w/13 tapes, $100. Ext. 2886 or 929-4850.

VIDEO CASSETTE RECORDER - VHS, Goldstar, front load, records up to 8 hours, visual search, timer preset, 105 channel selections. Ext. 5873.

Miscellaneous

TYPEWRITER - antique, $30; water skis, $20; men's slacks, new, $5; desk lamp, $20; large old barrel, $100. Kathy, 744-2203.

SHOES - women's, sizes 8½-9, varied styles, colors & widths, all excel. cond., $5-$10/pair. Ext. 4538 or 924-2012, leave message.

TOYS - preschool age, call for list. J. DiNicola, Ext. 5100.

VENDING MACHINE - mechanical type, new, 4'h x 2½'w x 2'd, $100. Dan, Ext. 4987 or 698-7322.

TICKETS - 4, Yankees vs. Baltimore, box seats 1-4, Thu., 7/4, 1 p.m., $40/all. John, Ext. 5565.

ENGAGEMENT RING - 0.82-carat diamond solitaire, new, $1,200. Dorothy, 281-7654.

Free

COAL - approx. one ton, anthracite, pea size. Ext. 4247.

Yard & Garage Sales

SHOREHAM - 41 N. Country Rd., antiques to uniques, furniture, bric-a-brac, toys & memories, pool table, lg. freezer, June 14-15, 10 a.m.-4 p.m.

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 - 4-bdrm. house, 2 baths, large l/r, new kit., d/r, 2-car gar., oil heat, fp, all appl., furn., nonsmoker, no pets, Sept.-Jan. $1,000/mo. Ext. 4332 or 286-2114.

EAST MORICHES - large studio apt., priv. ent., off-street parking, priv. bath, full kit., $600/mo. incl. util. & cable. 878-8506 after 6 p.m.

MEDFORD - large 1 bdrm., l/r, eik, d/r, lots of closets/cabinets, storage, pvt. ent., deck, w/w, close to shopping/LIE, no pets/smoking, $700/mo. all. Walter, 289-3586.

MONTAUK - 3 bdrm., 2 baths, fp, large deck, cable, laundry, fin. bsmt., furn., walk to ocean, 2 week min. Jim, Ext. 4150 or Ruth, 563-8374.

PORT JEFFERSON - 4-bdrm. ranch, eik, l/r, d/r, fam. rm. w/fp, all appl., fin. bsmt., 2-car gar., avail. Sept., no pets, $1,100/mo. Ext. 2920 or 473-5092 after 6 p.m.

PORT JEFFERSON STATION - 1-2 bdrm. house, l/r, eik, full bath, kit., dw, skylight, yard, driveway parking, $725/mo. + util. Biqi, 928-3969.

WADING RIVER - cozy 1-bdrm. apt., eik, l/r, full bath, nonsmoker, no pets, $500/mo. + sec. & refs., avail. 7/1. Janet, Ext. 2345 or 929-3910.

YAPHANK - 4-bdrm. restored Victorian, lg. treed prop., patio, 5 mi,. from Lab., recently remodeled, avail. now, 924-5219, 924-4872 or 924-3066.

LAKE GEORGE - 2-bdrm. lakefront cottage, priv. deck, 6/15-7/13, $2,000; 8/18-8/30, $1,200. 518-747-7821.

For Sale

BELLE TERRE - 1-acre bldg. lot, English Tudor section, Village 24-hr. police, beach, children's programs, golf, tennis, $245,000, terms. 928-1020.

CENTER MORICHES - 3,300 sq. ft. comm. bldg., Main St., nice location, 3 incomes, good investment, terms. 878-1178.

CORAM - Strathmore East, 4-bdrm. ranch, 2 baths, cathedral l/r, 2-car gar., gas heat, fenced corner lot, $120,000. Ext. 3791 or 928-7154.

EAST MARION - beautiful 1 acre bldg. lot, adjacent to Greenbelt, walk to Sound. 325-0447.

HOLTSVILLE - 2-bdrm. ranch, fp, new windows, ag pool, low taxes, 15 min. to BNL, near shopping, fenced yard, $119,000, neg. Peter or Kelly, 289-1732 after 6 p.m.

MEDFORD - Blue Ridge, 3-bdrm. condo, l/r, d/r, galley kit., util. rm., 1½ baths, rec., in/out pool, tennis, golf, price neg. Ext. 4853 or 698-4372.

MEDFORD - 3-bdrm. hi-ranch, low taxes, l/r, d/r, fin. bsmt., gar., fenced, ig sprinklers. Lou, 928-7042.

MIDDLE ISLAND - Coventry Manor, 3-bdrm. townhouse, 2 baths, kit., l/r, d/r, laun. rm., cac, 5 appl., enc. patio, carpet, more, ask. $102,000. Rosalie, Ext. 3160 or 289-5704 after 5 p.m.

MILLER PLACE - 4-bdrm. ranch, N of 25A, eik, l/r w/fp, 2-car gar., hardwood floors, all new windows, ¾ acre, $184,990. Annamarie, Ext. 2352.

NORTH SHIRLEY - 3-bdrm. ranch, l/r w/cathedral ceilings, den, new eik, new vinyl windows, sun room w/French doors, fenced, 0.4 acre, $120,000. Ext. 3403.

SHIRLEY - Smith Point, Cape Cod, det. gar., city water, low taxes, fenced, full bsmt., oil heat. 399-4897.

SHOREHAM - 3-bdrm. ranch, SWR SD, low taxes, large eik, dr/lr, den, 2 baths, atrium, lg. storerm., cac, gas heat, all appl., $145,000. Ext. 2838 or 744-7172.

SOUND BEACH - 3-bdrm. ranch, 2 baths, l/r, d/r, eik, fin. bsmt., gar., deck, pool, $145,000. Ext. 7918 or 821-1271.

WHITESTONE, QUEENS - 2-bdrm. att. brick home/gar., 2 baths, eik, l/r, bsmt., yard, excel. neighborhood, must sell to settle estate, best offer over $175,000. Frank, Ext. 4273.

YAPHANK - Colonial Woods, 2-bdrm. condo, 1½ baths, fin. bsmt., wet bar, pool, tennis, rec., facil., 5 min. to Lab., red. to $100,000. Monica, 924-3846.

Wanted

ARMOIRE - and coffee table, light wood or painted. 821-2854.

CAR SEAT - used, in good cond., for second car. Ginger, Ext. 2073 or 472-6613.

DINGHY - or small boat, any cond. Tom, Ext. 7115 or 744-5801.

FOUR-YEAR-OLDS - for enrollment in Upton Nursery School for Sept. Cathy, 9234-2205.

GAY MEN & WOMEN - to join us for our next on-site meeting, Fri., 6/21, dinner to follow. Call for details, 758-0930.

HOUSE TO SIT - free, exp., reliable, any period after Aug. 3. J. Allentuck, Ext. 2412.

HOUSEMATE - Center Moriches, share 4 bdrm. house, 20 min. to Lab, priv. bath, share l/r, kit., waterfront. Gail, Ext. 3429 or 878-4130.

HOUSEMATE - 2-bdrm. house, 1½ baths, more, no pets/child., single working, nonsmoker, $350/mo. + ½ util. 698-0576 or 231-6017 after 1 p.m.

LAWNMOWERS - old, complete, any cond. OK. 698-7322.

MOTORCYCLIST - for boat ride, Marcus Dairy, roadside picnic & Gillette Castle tour, June 23rd. Kevin, Ext. 4843, or Frank, Ext. 2022.

OLD DOLLS - will buy all bisque Bye-Lo circa 1925, also related items. 475-4199.

PEOPLE TO JOIN - non-denominational Christian fellowship group, every Thurs. at noon in the Rec. Bldg., apt. area. Pete, Ext. 3297.

In Appreciation

We wish to thank Staff Services and all my friends and co-workers for their support, comfort and prayers on the loss of our son.

— Linwood Johnson & family

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