

New Highs At The Tandem

New world records for electrostatic accelerators were set with the operation of the Tandem at terminal voltages above 14 MV and acceleration of heavy ions to energies as high as 320 MeV. These records were established at BNL only a few weeks after the latest improvements of the Tandem facility had been completed. The previous maximum heavy ion energy was 250 MeV also obtained here and the new performance will lead to a very significant increase of our research capabilities. Many large and small improvements were incorporated into MP-7, the main Tandem, and

many people worked very hard to make this possible.

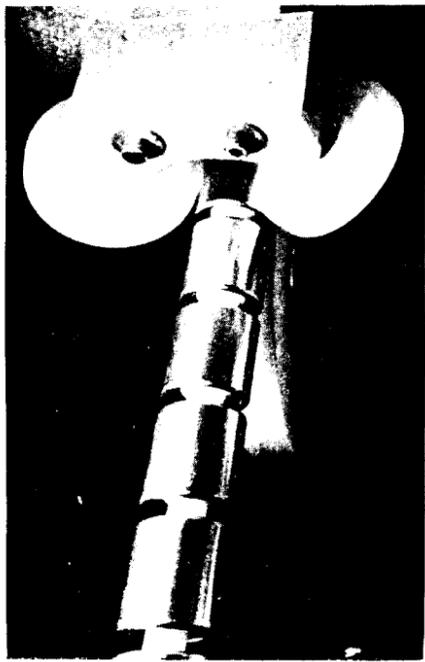
The main improvements are the installation of a new inductive chain-charging system (the "Pelletron") which replaced the old charging belt, the modification of the protective spark gap configuration on the acceleration tubes, and the development of the magnetic-plus-inclined-field secondary electron suppression scheme. The first of these items was purchased from the National Electrostatic Corp. and installed, tested, and put in operation by Tandem personnel. The last two items were fully developed and implemented at the Tandem.

The pelletron is a charging system which provides greater reliability at higher voltages than the old belt system and, in addition, the voltage and energy stability of the accelerator has improved by a factor of about 5 as a result of its installation.

The modification of the protective spark-gap system was the most tedious part of the upgrade job since well over 4,000 clip-on gaps had to be carefully installed and adjusted. A single one falling off would cause a shutdown of at least one day. This has not happened so far and the benefits of the new protection system are clearly evident in providing a much more reproducible and safe operation at higher voltages.

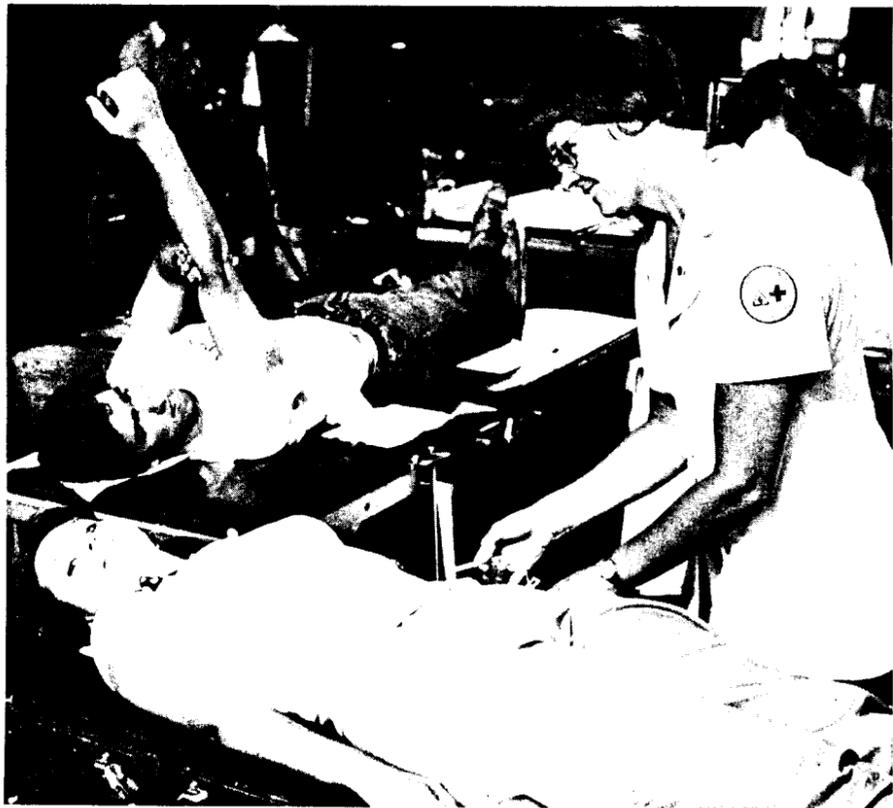
The magnetic-plus-inclined-field electron suppression scheme is an original development which for the first time combines electrostatic and magnetic suppression of secondary electrons and ions in the acceleration tubes. The results are indeed spectacular. The so-called tube sparks which are large electrical discharges inside the acceleration tubes have been largely eliminated. The conditioning rate (rate at which the voltage can be increased) is several times as fast as before and the tube performance at 14 MV is much more stable and quiescent than it was before at 13 MV, thus opening the possibility for still higher voltages in the near future.

The people who were directly responsible for the upgrade program are the members of the Tandem Operations and Development Group. They received valuable assistance from the User Support Group, from various machine shops, and from many other members of the Physics Department.

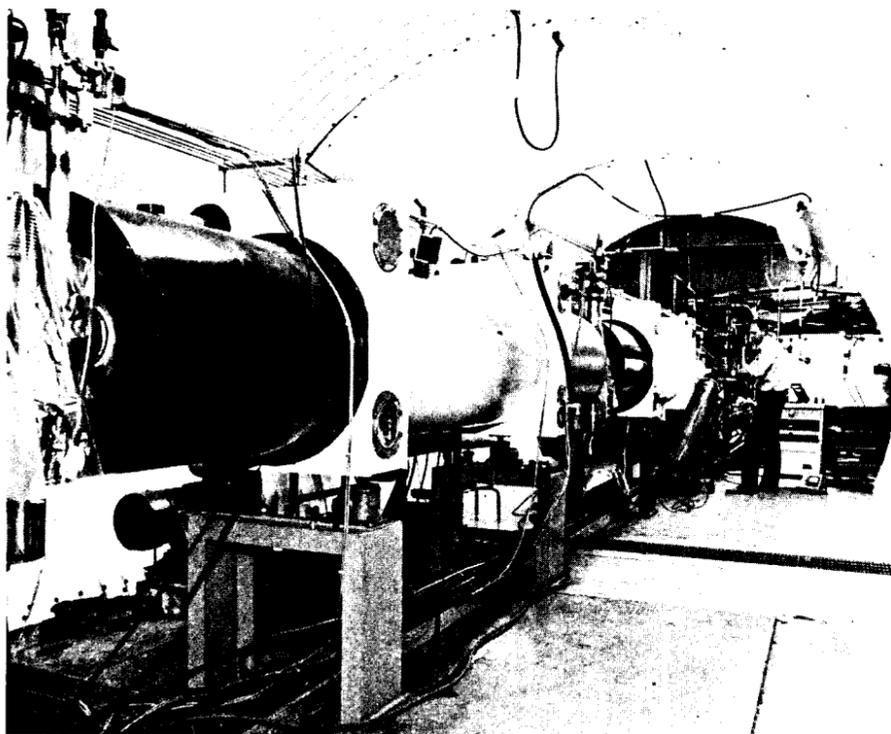


Above is a section of Pelletron-charging chain. This chain is made of stainless steel hollow cylinders joined by nylon insulating links. Six chains, each about 35 feet long, run from the ground end of the accelerator column to the center high voltage terminal, carrying the electric charge necessary to maintain terminal potentials of up to 14 MV. The chains, each made of over 600 links, travel at a speed of about 32 miles per hour and are each capable of carrying a current of up to 1/10 milliamperes.

Recycling Life



Starting at 10:00 a.m. on Wednesday a steady procession of employees and some of their relatives filed through the gym to give a pint of blood in BNL's 7th Annual Blood Drive. Associate Director Victor Bond was the first donor and was followed by 10 firemen who had completed their shifts. About 870 people were expected to give blood during the two-day drive which ended yesterday. Some were newcomers who approached the tables with a little anxiety, and others were veterans who had lost track of how many times they had given. The BNL Hospitality Committee dispensed coffee and other pick-me-ups to the donors. Organized by Jerry Kinne and Janice Lamb in the Director's Office, the smooth flowing operation in the gym took only one hour of an employee's time, but the blood given could mean a lifetime to an accident victim. —photo by Marin



A partial view of the half cell showing two dipole magnets and, at rear, the sub cooler vessel from which the high pressure helium gas enters the string of magnets. Not shown are the power supplies, the automatic computer control system and a third magnet, a quadrupole. —photo by Rosen

Public To See ISABELLE Research

The ISABELLE staff reports that full power was achieved on a simulated section of one of the ISABELLE rings. This modern engineering feat is an important step for the ISABELLE project and will be a special stop during public tours of the Lab on July 9 and 10.

The term "cell" is used to describe all the magnetic steering and focusing equipment in a section of ISABELLE's tunnel. The test system is a "half-cell" containing all the interconnected components for one of the two intersecting rings in the tunnel.

A mock-up tunnel houses the half-cell in the old Cosmotron experimental hall. For many visitors this will be the first opportunity to view some of the research on ISABELLE — BNL's proposed \$173 million accelerator.

Superconducting magnets are the main feature of the half-cell. These differ from conventional magnets because they are cooled to temperatures close to 460 °F below zero.

At this low extreme of the temperature scale, the phenomenon of superconductivity takes place, and in certain metals all detectable resistance to electric current disappears.

Since the intensity of electromagnetism depends on the amount of current passing through a coiled conductor, loss of resistance is important in building magnets. More current can run through the magnet's coil, producing much more powerful magnets.

Per Dahl, a physicist in the Accelerator Department, explains the difference in terms of gauss — the unit for measuring intensity of magnetism. He said: "The magnetic field in ISABELLE's superconducting magnets at peak excitation is 40,000 gauss compared to 13,000 gauss in the AGS."

Dahl stressed that both these figures represent extraordinarily strong magnetic fields. Typically, a person might have magnets in household items with only a few hundred gauss. And the most common experience, the earth's magnetic field, is only a few gauss.

Testing the System

Superconducting magnets are not new at Brookhaven, where pioneering research has been conducted. This particular magnet system is important because it demonstrates that several superconducting magnets can work in unison, with a single power supply and refrigerant source.

Getting the magnets to work together properly was a key objective of the half-cell's builders. These magnets are electrically connected in series. Both the main power supply and the various magnet tuning systems are programmed by computer.

"The magnets in the half-cell do two things: two dipole magnets bend the beam and a quadrupole magnet focuses," said Dahl.

The magnets surround a vacuum pipe which the beam of particles travel in. The steering power of the magnets keeps the beam from hitting the vacuum chamber wall.

However, as particles travel through the beam pipe, they tend to resonate naturally. Dahl described this as "like beads oscillating on a string. . . up and down, side to side."

A certain amount of this resonance has to be tolerated. But if the amplitude is too great, particles are lost in premature collisions with the walls of the chamber. Only a guiding magnetic field that is precisely shaped can prevent this loss.

"The magnetic field strength has to be increasing all along the particles' path as they go around the ring in their orbit," said Dahl. "So the magnetic field from magnet to magnet has to maintain a constant rate of increase and this has to be identical to a very high rate of precision."

Scientists describe this inter-relationship as the magnets "tracking each other." And the half-cell was a great success in showing that superconducting magnets can be constructed to track each other accurately while operating in series.

Stopping the Quench

Another primary concern of the ISABELLE group was to control a phenomenon called "quenching." A magnet is said to quench when all stored energy of the magnetic field is suddenly released.

The critical parameters for a superconducting magnet are temperature, magnetic field, and current. A superconducting magnet quenches when any of these critical levels for the individual magnet are exceeded.

What happens in effect, is that the magnet ceases to be superconducting and the conductor shows resistance to current. This resistance produces heat.

The heat from the quench causes the cooled helium refrigerating environment to evaporate violently. This warm gas can lower the temperature of the next magnet and cause it to quench. In this manner, a quench may pass all the way down a line

(Continued on page 2)

No Bulletin Next Week

Because of the extended July 4 holidays, the Bulletin will not be published on July 8.

Service Awards July

Thirty Years

David H. Gurinsky.....Applied Science
William E. Keating.....Reactor
Arnold M. Roesch.....Physics
Ralph P. Shutt.....Physics
Frederick J. Silkworth, Jr.....Chemistry
Irene G. Steele.....Biology
Norman A. Still.....Fiscal
Alan M. Thorndike.....Physics

Twenty Years

Eleanor C. Anderson.....Medical
John S. Bookless.....Applied Science
George Dioguardo.....Supply & Materiel
Dorothy K. Groobert.....Accelerator

Ten Years

Robert C. Aldridge.....Accelerator
James R. Denlea.....Plant Engineering
George Kircher.....Staff Services
Peter M. McHugh.....Administrative
Systems & Data Processing
Dennis J. Morgenthaler.....Applied Math
George W. Murdock.....Accelerator
Franklin J. Powers.....Plant Engineering
Betty Rauso.....Medical
John Skalyo.....Applied Science
Joan L. Tiller.....Technical Information

ISABELLE (Cont'd)

of magnets. So the ISABELLE team has developed a protection system.

The quench protection system is designed to detect a quench taking place in the line. Automatically, the circuits bypass the quenching magnet to prevent overheating.

Also, the heat is removed to an external cooling source. This confines the quench to the magnet which initiated the event. After initial adjustments, the protection system worked perfectly.

Many other aspects of the ISABELLE facility, concerning the interaction and interconnection of components, are being explored with the half-cell. The next task is to build a full cell using magnets assembled industrially which is the projected mode for constructing the remaining 900 magnets from BNL prototypes.

In addition to the mini tour of ISABELLE research visitors will be able to take a guided bus tour of the Lab site. A prolonged stay at the Exhibition Center is also possible as part of the regular program.

Saturday and Sunday, July 9-10, mark the beginning of the summer tour season. Hours are from 10 a.m. to 4 p.m. The summer program lasts until the end of August.

—Cliff Cockerham

ERDA Meeting on Coal Burning Process



Representatives of industry, universities and other laboratories, attended an ERDA review meeting here last week on regenerative desulphurization in fluidized bed combustion, which is considered one of the most promising methods for the clean burning of coal in large scale power production. After the meeting, the participants toured the DAS Process Technology laboratories. From left are J. Yerushalmi, City College of N.Y.; Ralph Yang, project leader, DAS; Irving Johnson, Argonne National Lab.; Thomas Wheelock, Iowa State Univ. — photo by Rosen

Bicycle Safety



Linda Moreno, Safety & Environmental Protection Division, talks to P.O. Harvey Richardson as she comes through the gate. Linda cycles to work from her home in Coram about three times a week. —photo by Rosen

The increasing popularity in cycling, due to the energy conservation and health benefits derived from this form of transportation, dictates the necessity for extra caution on the part of both the motorist and cyclist, particularly since there has been growing concern over the safety of bicycle commuters arriving on site though the main gate. West Princeton Avenue is a very narrow roadway, and the hazard to the cyclist is greatly increased each time the cyclist is passed by a motor vehicle.

The bicycle rider does not generally see himself as a legitimate road user, subject to the same traffic laws as the automobile driver. Nor, on the other hand, is the automobile driver very aware of the bicyclist's place on the road as other than a nuisance vehicle.

Motorists should consider bicycles as another vehicle, and every courtesy should be extended to them in this respect. Additionally, bicyclists are required to observe the rules of the road which are familiar to motorists.

The following rules should be strictly ad-

hered to by motorists.

- Do not pass bicycles in the same lane.
- Keep appropriate distances when moving behind bicycles.

The cyclist must observe traffic regulations that apply to vehicles, such as keep to the right, signal for stops and turns, and obey traffic signals and signs. Following are some rules which should be followed by cyclists on site.

- Ride with the flow of traffic on the right-hand side of the road.
- Ride single file if with a group.
- Slow down at all street intersections, stop if required, and look to the right and left before crossing.
- Learn proper hand signals and use them.
- Ride in a straight line. Do not weave in and out of traffic, or swerve from side to side.
- Use caution when pulling out of parking lots and driveways.
- Always ride at a safe speed.
- Give pedestrians the right of way.
- When commuting, it is desirable to wear protective headgear.

Engineering Course

Professor Richard C. Alkire of the Department of Chemical Engineering, University of Illinois at Urbana-Champaign, will present a short course in Electrochemical Engineering at Brookhaven. The course will include topics such as the scope of electrochemical engineering, transport phenomena, current distribution phenomena, modeling electrochemical systems, the optimization of electrochemical systems. The five two-hour lectures will be held in the Hamilton Seminar Room, Building 555, from 9:00 a.m. - 11:00 a.m., on July 11 through 15. Those interested in attending this course, please contact Dr. S. Srinivasan, Building 815, Extension 4494.

Arrivals & Departures

Arrivals

Barry L. Burns.....Accelerator
Janis T. Fritts.....Applied Science
Thomas P. Hatsis.....Ph. & Gr. Arts
Mahendra P. Jamuar.....Medical
Jodi Werner.....Applied Science

Departures

Vassilis Agoritsas.....Accelerator
Harold Basch.....Chemistry
William D.K. Clark.....Chemistry
Herbert L. Engstrom.....Physics
Charles Flaum.....Physics
Lance K. Heiko.....Applied Science
Nancy L. Kubinak.....A.U.I.
Hans B. Moller.....Physics
Michael F. Moody.....Biology
Thomas Neville.....Plant Engrg.
Richard M. Spitz.....Accelerator
William J. Turner.....Applied Science
M. Daniel Willis.....Adm. Sys. & Data Proc.

It's... Cricket

BICC is scheduled to play its third home game against Staten Island Cricket Club on the 16th of July at 1 p.m. Since the Staten Island Club has an established and reputable cricket team, BNL will be tested this time to maintain its unbeaten home game record. BNL won the first match here against Stony Brook by a score of 43-37. The scoreboard for the Cornell games on June 18 is given below.

BNL-First Innings

D. Majumdar	b Pauda.....	4
K. Batchelor	c Iyer b Panda.....	0
J. Millener	b Bhanot.....	28
D. Banerjee	b Praveen.....	34
S. Dhar	no out.....	9
M. Murtagh	b Bhanot.....	10
G. Williams	b Bhanot.....	0
E. Beardsworth	b Bhanot.....	1
D. Fyfe	not out.....	0
Extras (16 bye, 2 1by).....		18
Total (7 wickets).....		104

G. Snape and I. Madni did not bat

Cornell - First Innings

Praveen	b Millener.....	0
Michael	1bw Banerju.....	1
Iyer	b Millener.....	36
Bhanot	b Millener.....	0
Sarker	b Millener.....	4
Panda	b Banerjee.....	11
Anwar	c Dhar b Banerju.....	6
Clive	b Millener.....	2
Klein	b Batchelor.....	3
Satch	b Dhar.....	1
Thompson	not out.....	0
Extras (6 bye, 2 nb).....		8
Total.....		72

b - bowled out 1by - leg bye
c - caught bye nb - no ball
bye - bye run

Have a good holiday, but stay dry

Many people see attractive liquor advertisements every year. The hopes of the sponsors of these nationally promoted advertisements that people will take alcoholic beverages with them to the beach, the pool, or on a boating trip are often confirmed.

While we are cautious of mixing drinking and driving, we are less aware of the hazards of mixing drinking and water sports. One study showed that 47 percent of drowning accidents were involved with alcohol. This has been confirmed by many public health officials who say that 47 percent is too low a figure. They guess from 50 to 90 percent.

While we can't say that alcohol is the only factor in such accidents, there seems to be an undisputable correlation between drinking and drowning.

People of all ages are victims of the kind of loss of judgment that leads to drowning. **Middle aged men seem more susceptible to boating accidents than most.** While prohibitions against alcohol at the beach are sometimes enforced, this frequently is ineffective. Boaters are even harder to regulate, but driving a boat under the influence can be just as dangerous as driving a car, both to oneself and others.

The easiest solution to the problem is to stay away from the water if you drink. Failing this, be extra careful with safety precautions - wear a life jacket, keep one person in the group sober, leave your navigation light on if boating, drive a boat with the same precautions applicable to driving a car.

The best precaution is to maintain a healthy respect for water as danger - stay dry, one way or the other.

—Nuclear Division News

BROOKHAVEN BULLETIN

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Letters To The Editor

Dear Friends:

June, 1977, marks the ninth year during which the Stephen F. VanDervoort Memorial Scholarship has been awarded to a deserving graduate of Longwood High School. The monies contributed by many colleagues at the Brookhaven National Laboratory, Middle Island administrators, faculty, as well as numerous friends in the community made this all possible. During this nine year span, some truly outstanding seniors have been afforded some financial aid to help them start that important journey toward higher education. My family is indebted to you for giving so graciously and generously to see that this result was achieved.

Those of you who had the privilege to know our son personally, realize that he was a strong advocate of the importance of education and especially the ultimate contribution it could make to the well being of others. There perhaps would never be a more appropriate way in which he would want to have been remembered. We believe the Scholarship Fund was exactly the way he would have wanted it.

The graduation of 1977, completes the awarding of all monies established within this fund. The VanDervoort family will remember with everlasting gratitude your valued contribution which made all of this possible in memory of Stephen.

Sincerely,
Fred VanDervoort

Rambling Around

These are bits and pieces picked up from here and there with occasional observations by the Editor:

- It has been called to our attention that in an item referring to a National Park Service document in this column last week, the word "boar" appeared instead of "bore." Claire Hull wrote, "I couldn't find a loophole in your National Park Service document, but in 'boar' there was a space big enough for a pig to get through." And Bill Webster put it this way: "One is not prohibited from boring a loophole." Clever types.
- The Suffolk County Archaeological Association has just published the first in a series of "Readings in Long Island Archaeology and Ethnohistory." In a foreword to this volume, "Early Papers in Long Island Archaeology," Gay Levine, editor, says that "The rapid Eastward urban development of Long Island has hastened the destruction of the area's prehistoric and historic archaeological remains - our irreplaceable cultural resources - and many other factors have combined on Long Island to foster one of the highest destruction rates in the nation. . . The S.C.A.A. has undertaken the reprinting of early Long Island records, documents, histories and reports so that we may have access to our past cultural record." Useful for serious students as well as for interested laymen, the volume is available from the Association P.O. Drawer AR, Stony Brook, New York 11790, or at the Suffolk County Historical Society Museum Shop and the Nassau County Museum System Shops. It sells for \$7.50.
- If your imagination was running wild as to why that airplane seemed to be endlessly circling the Laboratory on Monday, be not alarmed. It was all perfectly proper. They were taking air samples for an atmospheric sciences project.

Cafeteria Menu

Week Ending July 8, 1977

Wednesday, July 6	
Puree of mongol soup	
Shrimp chow mein on rice	1.15
Short ribs of beef & 1 veg.	1.30
Hot deli - Italian sausage & peppers	
Thursday, July 7	
Cream of chicken soup	
Broiled chicken livers & 1 veg.	1.05
Ham & cheese turnover, fr. fr., cole slaw	1.30
Hot deli - roast beef	
Friday, July 8	
Clam & celery soup	
Seafood cakes & spaghetti	1.10
Pot roast & 1 veg.	1.30
Hot deli - smoked tongue	

Tennis

Advance reservation of courts 1, 2, & 3 will be in effect July 6. Sign-up sheets and governing rules are posted in the BERA Sales Office, Berkner Hall.

General rules on priority use of the courts and the new on-court scheduling are now posted on the bulletin board at courtside and are effective July 1.

The annual Laboratory Tournament will commence on the weekend of July 16. Registration sheets are now available at the BERA Sales Office. Wednesday, July 13 will be the last day of registration and the draws will be posted courtside by July 15.

Softball

Mixed

TNT 20, Trouble 2

TNT rallied in the 4th inning with home runs by Pete Heotis and Arthur Coone. The team was sparked with excellent fielding by Jeanne Weber and Debbie Walton as well as the fantastic pitching of Howie Bell.

Hard Ballers 19, Diamonds 8

Oh Kay's 10, Turkeys 4

Balls & Strikes 10, I Don't Know 9

TNT 12, I Don't Know 8

The IDN's fought back to tie the score 8-8 in the seventh inning. The TNT's held the score with a double play between Jeanne Weber at third and John Karkheck at first, then came back with four runs in the ninth.

Balls & Strikes 11, Trouble 8

The game was scoreless until the fifth inning when both teams broke loose. Freddie Gilleta's pitching made the key difference.

Diamonds 9, Oh Kay's 7

Kudos to the team who finally beat the perennially undefeated OK's. For the Diamonds, the heroes were Artie White with his clever pitching and especially Pat Manzella with her spectacular fielding at second base.

Turkeys 10, Hard Ballers 7

In a game fought hard right down to the wire, the winning differences were Mike Zguris' two home runs and Glenn Snape's slow looper pitches which stymied the HB's bats.

Standings as of 6/23/77

Division 1	Won	Lost
TNT	4	1
Balls & Strikes	3	2
Diamonds	3	2
Turkeys	3	2
Division 2	Won	Lost
Oh Kay's	4	1
Hard Ballers	2	3
I Don't Know	1	4
Trouble	0	5

Special Notice

July 7 - No regular games. A BNL All-Star women's team will play Sunny's Girls from the Brookhaven Town League. Come and cheer our team on!

League I

Team Standings as of June 21

	Won	Lost
Ravens	5	2
Old Timers	4	3
Blue Jays	4	3
Hawks	1	6

At the present time, the Ravens are leading their league by one game and could wrap up the first half with a win over the Dirty Sox during this week's inter-league play.

After a slow start, the Blue Jays have come on to tie the, always tough, Old Timers for second place. The Rebuilding Hawks are out of it for the first half, but are expected to make a come-back in the second half.

Volleyball

Hot action in recent play brought a virtual 3-way tie for first place - the Thunderbirds took six games and the Scurves won three to jostle for the leader's spot.

	Won	Lost	Pct.
New Team	14	7	.666
Thunderbirds	16	8	.666
Scurves	15	9	.625
Setups	12	15	.444
Pushovers	6	18	.250

Table Tennis

Two new tables have been purchased and are set up in the south dining room at the Brookhaven Center.

All members of the BNL Table Tennis Club are invited to an important meeting on Wednesday, July 6 at 12:00 noon at the Center to finalize rules for the start of the ladder tournament. All members who have not yet paid their \$1 dues, please make payment to Jim Gilmartin, treasurer, Bldg. 535, as soon as possible.

Runner's Corner

Five years ago four BNL runners cautiously started their first Cross Island "Marathon" (at that time 12.3 miles) from Port Jeff to Patchogue. Three of them finished. On June 18, 1977, 15 BNLers confidently started the Cross Island Run (now increased to 15.6 miles) and all of them finished. Ted Landry (DAS) completed the race in 92 minutes for 25th place out of over 700 runners. Joining him at the finish were Wayne Danker (DAS), John Beerman (DAS), Bill Thomlinson (Physics), Dick Fuller (Physics), John Elmore (Medical), Bill Kropp (DAS), Jim Guppy (DAS), Bill Piel (Physics), Paul Kupferman (Applied Math), Ron Wieder (Accel.), Sol Pearlstein (DAS), Art Harris (Applied Math) and the first and only BNL female, Gail Waite (DAS).

An update of other races in which BNL Roadrunners have participated finds Wayne Danker and Gus Prince finishing 21st and 46th respectively out of over 600 runners in the Long Beach 10-mile run on May 29. On the same day, Jerry Kinne and Pete (Steady) Rathvon ran and received awards in the 6-mile Nautilus Heart Fund Dix Hills Derby held in Huntington. They also participated in the Weeple 5-mile run in Belle Terre along with Bill Thomlinson, John Elmore and Bob Thomas.

On June 6, Landry, Danker, Prince, Beerman and Kropp ran against some of the top middle distance runners in the East in a 5000-meter run held at St. Anthony's High School. A New York State High School record was set that day and Gus Prince took first place in the master's division.

The following week, John Duggan (PE) and John Ferrera (PE) joined Beerman, Kropp, Landry and Prince for the 5-mile run at Pilgrim State Hospital. Again the BNLers held their own with Landry placing a close second overall. His wife, Elaine, also received a first place trophy for her time in the female category. Gus Prince (11th overall) took first in the 35 and over category.

Gus Prince won three gold medals for winning the 1, 3 and 6-mile runs in the Masters Sports Association Annual Track and Field Championships at Downing Stadium in NYC. He also set meet records in both the 3 and 6-mile races.

The past year has been a growing period for the BNL Roadrunners. The number of runners and the participation in events has increased. The Roadrunners are now recognized as major contenders in all races that they enter and the records of past performances certainly substantiate this.

Not all BNL runners are competitive, but they run and jog to keep in shape. In doing so many have found all that is said about a steady running diet is true and the benefits from this activity cannot be overestimated.

Coming up on July 10 in Rocky Point are several runs sponsored by the Rocky Point Joggers and the Suffolk Heart Association, a 1/2-mile run for ages 12 and under, a 2-mile fitness run for beginners and a competitive 6-mile run. This is also a challenge meet for the BNLers. For more info contact Beerman (4076), Prince (2901) or Thomlinson (3978).

Sheer Delight



Malcolm Howells (Physics) climbing at Seneca Rocks in West Virginia -photo by Donaldson

Mountain Club

The BNL Mountain Club has planned a weekend at the Shawangunk rock climbing area for July 16-17. Greg Donaldson and Malcolm Howells will provide instruction for beginners and intermediates. Climbers of all abilities will find ample challenge. Those without any experience are welcome - you need not be a member of the club.

To arrange transportation contact Greg Donaldson at Ext. 3722. Plan to bring a sleeping bag and tennis shoes. Meals are available at local restaurants or cook your own.

Bicycle Touring

Seven BNLers defied early morning cloudiness and congregated at Berkner for the Beginner's Tour to Wildwood last Sunday. The weather soon turned bright and a pleasant ride was enjoyed by all. The group included Mike and Robert Dooley, Frank Fridrich, Gerry Morgan, Kevin Scoles, Frank Toldo, Debbie Zuckerman, and Gary and Kate West.

The next tour coming up is the one-day, sixty-five mile Riverhead Run on July 10. This ride starts at 9 a.m. at the town parking lot in Riverhead just north of the traffic circle and river. A group will also assemble in the Berkner parking lot at 8:15 to share transportation to Riverhead. The ride goes out the south fork to Sag Harbor, by ferry (\$1.25 total) to and from Shelter Island, lunch in Greenport, and back to Riverhead by the north fork. Most riders get back between 5 and 6 p.m. There will be no sag wagon, so carrying a spare tube is not a bad idea.

Pool Schedule

Starting next week, the following swimming pool summer schedule will be in effect until Sunday, September 4. Monday and Tuesday, July 4 and 5 - BNL holidays, the pool will be closed. Wednesday, July 6 and each weekday following:

11:30 a.m. to 1:30 p.m.	employees only
1:30 p.m. to 3:00 p.m.	children's swimming lessons
3:00 p.m. to 9:30 p.m.	employees/families/guests*
Saturday and Sunday	1:00 p.m. to 6:00 p.m.
	employees/families/guests*

*Guest Ruling: Only one guest per adult BERA member may be admitted to the pool at any one time. Adult BERA members may have more than one but not more than five guests at any one time by making advance arrangements with the Recreation Representative in the Personnel Office. Members will be responsible for the conduct of their guests or their children, or both.

As an added note - the pool will be open this weekend Saturday and Sunday from 1:00 to 6:00 p.m.

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific 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, as indicated below. Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2874 or 2882.

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

231. ENVIRONMENTAL SCIENCE ASSOCIATE - MS/PhD or equivalent in environmental science or economics with strong background in energy conservation or the impacts of energy technologies on the environment. Analytical and computational abilities are also required. Department of Applied Science.

232. CONTRACTS SPECIALIST - BS or equivalent in business administration. Must be well versed in all aspects of procurement with emphasis on contract preparation & administration. Ability to relate effectively with multi-level technical & managerial personnel is required. Contracts & Procurement Division.

233. BUYER - BS or equivalent in business or engineering with background in subcontracting machine shop, mechanical & electro-mechanical fabrication. Knowledge of government procurement regulation is required. Contracts & Procurement Division.

234. COMPUTER SCIENCE ANALYST - BS or equivalent. Requires high degree of competence in running programs & making programming changes. Must be able to interact with engineering analysts for short deadline, quick turn around studies. Approximate duration of position is 7 months. Department of Applied Science.

235. TECHNICAL SPECIALIST - AAS or equivalent in mechanical technology with background in the construction & maintenance of moderate pressure hydrogen systems. Department of Applied Science.

236. TECHNICIAN - AAS or equivalent in mechanical technology to assist in the operation, maintenance & repair of all types of magnets, vacuum systems and water systems. Shift work. Accelerator Department.

237. OFFICE SERVICES ASSISTANT - Must have knowledge of and background in the processing of accounts payable. Fiscal Division.

238. VETERINARY SERVICES ASSISTANT - Animal caretaker. Some weekend & holiday duty is required. Two positions. Medical Department.

239. HEAVY EQUIPMENT MECHANIC OPERATOR Plant Engineering Division.

Autos and Auto Supplies

69 LINCOLN CONTINENTAL - Classic 4 dr, fully equipped, tape deck/stereo, garaged, well cared for, very good cond. \$1495. 585-9816.

75 SUZUKI - TM 75 motorcross or trail, excel cond, must see. \$240. Ed Rogers, 924-3821.

HARLEY DAVIDSON - X90 cc, minicycle, excel cond. \$300. Ronnie, 732-6712.

67 CADILLAC - Excel cond, must see. \$750. 732-6712.

TAPE DECK - 8-track stereo, fits in dash for Firebird, Camaro, under dash all other cars. \$30. Ron, 473-5939 after 7.

TIRE - LR78-15 Goodrich steel belted w/w radial, 30,000 mi, still on tire. \$30. Azzara, Ext. 4701, 271-2877.

70 OLDS - Tornado, ac, power everything, immac, must sell. \$1200. 589-6383.

73 ROAD RUNNER - 318 auto, excel cond, like new. \$2800 or best offer. Linda, Ext. 3199, 727-7304 after 5:30.

71 VW - Superbeetle, red, auto, good cond, am/fm/8-track stereo, must sell. \$900 or best offer. Toshi, Ext. 2115.

76 VOLARE WAGON - Standard w/overdrive, 25 mpg, radial snows, Zeibart Factory warrantee, blue book or best offer. 928-7344.

73 INTERNATIONAL - 1110 pickup, 4 wheel dr, 4 spd, very good shape. \$2650. Ext. 4050, 929-6961.

VW DUNE BUGGY - Just put an eng in and it's ready to go. 588-5833.

AM RADIO - Push button, fits 69 Dodge Dart. \$10. John, Ext. 4520.

TIRE - Firestone 78-15 w/w steel belted radial, never used. \$45. 751-1327.

72 AMC SPORTABOUT - Station wagon, 30,000 mi, ac, sunroof, auto trans, every option, flawless. \$1600. Ext. 2916, 325-0363.

MOTORCYCLE - Suzuki 50 cc w/helmet, car attachments for traveling, good cond. Denise or Don, 585-9816.

67 CADILLAC - Sedan De Ville, all new components, very good cond. Ext. 3828, 751-7250.

72 CHEVY CARRYALL - 350, auto, ps, orig owner, excel cond. \$1900. H.P. Richardson, Jr. 286-2616.

69 DODGE MONACO - High mi, new battery, 2 new tires, no radio, good mi to gallon. \$700. 286-8517 after 5:30.

72 VETTE - Blue coupe, 350, 4 spd, am/fm, wide tires, ansen mags, tinted windows, alarm, must sell. 928-0954 eves.

PEUGEOT DIESEL - 12,000 mi, 35 mpg, sunroof, am/fm stereo rust proofed. \$6250. Barbara, 924-4162.

60 INTERNATIONAL - Ice cream truck w/new transmission, extra freezer. Don, 732-7677.

AM RADIO - For 72-74 Dodge van, fine cond. \$20. John, Ext. 3292.

72 CHEVY CAPRICE - 34,000 mi, am/fm 8-track, ac/ps/pb, like new. \$2295. 475-0364 after 6.

73 CIBI - 60 cc. \$100. 878-0201.

66 BARRACUDA - \$225. 732-8853.

75 AMC PACER - Red, bucket seats, standard shift, excel cond, good gas mi. \$2500. Gail, Ext. 3653, 878-4664.

HEADS - For 283-327-350 Chevy, all new valves, never used since rebilt. \$80 for pair. Chet, Ext. 3280.

RIMS - (2) 15" 5-hole, \$5; (2) 13" 5-hole rims, \$3. 727-5912.

71 YAMAHA - Street & trail, excel cond. Ext. 3284, 744-8567 after 6.

NEW TIRE - Sears G78-15, dynaglass, 2 + 2, w/w mtd on Merc rim. \$15. Ext. 3712.

72 PONTIAC CATALINA - 4 dr hdtp, ac/ps/pb, good cond. Asking \$1400, or best offer. 727-3869 after 5:30.

MICHELIN TIRE - Size 175 HR 14 and rim. Ext. 2113.

Boats & Marine Supplies

60 HP OUTBOARD - Evinrude, 5 yrs old, 16' MFG, fiberglass w/trailer. Asking \$1700. Ext. 2632, 821-0850.

75 KELL - 23' sailboat, bunks 4, head, galley, sails main & jib, 5 hp outboard, galvanized, heavy duty trailer. \$7000. Ext. 3284, 473-1761.

19' THOROBRED - Good cond, wide beam, must see. Mrs. Morris, 588-3669.

FLYING DUTCHMAN - 20', sails incl main, jib, spinnaker, rigged, ready to sail. Richard Gelinas, 692-6785.

20' DEEPVEE - Fiberglass runabout, fw, 165 hp, V8, very good cond, price negotiable. 286-0237 after 6.

17' CARAVELLE - 130 hp i/o, incl deluxe trailer, elec winch, extras, 1973, very low hrs, excel cond. \$3700. 277-9669.

19' CRUISER CHALLENGER - 1973, 115 hp Merc o/b, fully equipped, full canvas, galv cox trailer w/per winch, many extras, mint cond. \$5000. Ext. 2482, 732-0974.

60 OWENS - 283 Chevy eng, good cond. Asking \$1200. 281-6468 after 5.

24' SAILBOAT - International 110 class boat w/sails & trailer. \$600. 744-4965, 744-8240.

14' ALUM BOAT - \$75. 727-5912.

Miscellaneous

2 WHITE UNIFORMS - Large, \$5 ea; ladies shoes, 9 1/2 A, Socialites, \$7; elec hair set, \$3; other clothing, large ladies & children. Call Walt, Ext. 2907, 698-0576 after 5 p.m.

AC FEDDERS - 7300 btu, 11.5 amp, hardly used. \$100. 924-3066.

COUNTERTOP SINK - Stainless, dbl drainboard, splash w/faucet & spray, \$35; sm refrig, \$15. John, Ext. 2501, 751-6390.

HOUSEPLANTS - Moving, mature collection. \$50 takes everything. Tom, 3525.

EXERCISER BICYCLE - \$20. Ext. 2543.

75 TRAILER - 24'. Ext. 2543.

ELEC SANDER - \$7; soldering iron, \$5. Ext. 2543.

FOLDING BICYCLE - European made, like new. \$35. 281-7844.

BASS AMP - Kustom III, 130 watts RMS 2-15" speakers, mint cond. \$300. 363-2614 after 6.

16" TV SET - W/cart, very good cond. Claire Hull, Ext. 3655, 281-2002.

TYPRO PHOTO TYPE - Composer w/desk, best offer over \$80. 281-6130 eves.

NIGHT TABLE - 2 drawer, \$7; Xmas tree, \$3; record player w/2 speakers, \$20; steak & brew set, \$5; baby swyngomatic, excel, \$10. 281-6130.

WIGS - Black, brown, lt brown, \$5 each; 1 long gown, black, size 9/10, used once, \$7. 281-6130.

MEN'S COAT - 100% pure virgin wool, charcoal gray, excel, \$10; 6 men's sports coats, different colors, \$7 each. 281-6130 eves.

HAIR STYLING - Selectric brush & comb, excel, \$3; new judo uniform, never used, \$20; Cory automatic humidifier, excel. \$25. 281-6130 eves.

GAF WEATHERBOARD SIDING - New still in box, red, \$8; sm white baby's crib w/mattress, up to 8 months, excel, \$10; lg heavy dresser w/9 drawers, \$30. 281-6130 eves.

POLAROID CAMERA - Swinger model 20, excel, \$10; pine colonial kitchen table w/3 chairs, \$50; warming tray, new, \$7. 281-6130 eves.

ATTIC FAN - Commercial unit. \$85. Gail, Ext. 3653, 878-4664.

SCOTTY TRAILER - 1969, 16', sleeps 6, self-contained. \$1500. 475-9021 eves.

1970 WHEEL CAMPER - Hdtp, gas, elec refrig, 3 burner stove, sleeps 8, attached canopy, extras, excel cond. \$1100. Ron, Ext. 4597, 924-8644.

RADIAL ARM SAW - 10", Sears, good cond. PeeWee, 666-6783.

SNOW PLOW ATTACHMENT - For riding mower, \$35; FM receiver, low band, \$35; seat for van (rear) excel cond, \$25. 473-9180.

ROCKING CHAIRS - Gd cond, full size, \$20; child's, \$8. S. Lacks, Ext. 3369 or 286-1022.

AIR CONDITIONER - GE deluxe model, 4 yrs old, seldom used, 19,000 Btu/hr, 13.5 amps, 220 volts. \$200. 286-0175.

ELEC CAN OPENER - Rival, lightly used 1 week, cost \$14, will sell for \$7. Phillips, Ext. 3497 Tues, Wed, Thurs.

TV - 25" color, Heathkit GR-295, in kit form, brand new, tube type, all PC boards are built, no cabinet, orig price, \$450, will sell for \$275. 475-2557.

TRAILER - For quarter horse, gd cond. Reasonable. W. Kane, Ext. 3841, 286-9450.

EVERGREENS - Fir tree, approx. 24" tall, 2 for \$5; lily of the valley plants, 20 for \$1. 727-1617.

CAMPER - Slide-on, 11 1/2', sleeps 4, 4 cu ft gas elec refrig, Monohead, self contained, w/w out 69 Ford camper special truck. 286-1097.

CAMPER - 36" Winnebago, 8' bed, bunks, 2 burner stove, cooler & sink. \$475 after 6 p.m. 399-3558.

WOOD LATHE - Sears 12", never used. \$100. Ken, 399-3558 after 6 p.m.

BICYCLE BASKETS - Large front delivery type, very gd cond, twin rear, like new, make offer. Ext. 2385 or 289-2382.

Ads left out of this issue because of lack of space need not be re-submitted in order to run in next week's issue.

CLOCK - Antique school house, \$98, circa 1890-1910, time & strike, excel. 981-8386.

SOFA - 3 cushion, very good cond, ideal for family rm, \$40; swivel rocker, \$10. 928-4922.

20" ELEC FAN - Slightly used, \$10. Rehana Mukhtar, 345-3001 eves.

SEWING MACHINE - Singer Touch & Sew II, mod 778, free arm & fashion discs, brand new cond. \$250. 924-7044.

PHILCO AIR COND - 5000 btu. \$40. Marie, Ext. 2456.

WHEEL CHAIR - Slightly used. \$25. 473-1578 after 6.

OFFICE TYPEWRITER - Manual, good cond. \$70. 473-1578 after 6.

BICYCLE - Boy's Schwinn 26", 5 spd. \$15. Dave Lloyd, Ext. 4391, 862-9178.

SEWING MACHINE - Sears, \$65; meat slicer, \$10; AM stereo turntable, new \$25. 281-6468 after 5.

STEREO SYSTEM - Sansui AU 9500 & TU9500, amp & tuner, 2 Braun 710 speakers, Thore NS 160 turntable, excel shape. Asking \$1000. Kevin, 732-8216.

YOUTH BED - Simmons Hollywood, \$20; green gingham bedspread, 2 pairs matching drapes, excel cond, table lamp, hanging lamp. 751-4780.

BEDRM SET - French provincial, twin beds, chest of drawers, dbl dresser w/mirror & night table. Ext. 3671.

FENCING - 100' galvanized welded 2" x 4" mesh, 4' high, 20 post, green painted; fireplace equip, screen, 38' x 31 1/4" high, draw screen, brass trim, grate, 5 pc tool set, tongs & wood box. \$50. 289-6490.

TRIPOD - Linhof, heavy duty, professional model. \$25. Ext. 4240, 286-0295.

TANDEM BICYCLE - Columbia, white, like new. \$65. 588-4733.

PAIR HEALTHY DOVES - Nick, 732-3778 eves.

POOL - 21' round x 4' deep, all alum, accessories. \$425. Marty, 751-0448.

PICKUP CAMPER - Fits 8' bed, panelled, lots of storage. \$650. 744-4316.

QUARTER HORSE TRAILER - 1972 Hale, good cond. W. Kane, Ext. 3841, 286-9450.

BICYCLES - Men's 3 spd, free spirit, Sears, \$50; men's 10 spd Vista; women's 10 spd Panasonic. \$100. PY8-8589.

Real Estate

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

For Sale

YAPHANK LAKEFRONT ACRE - 3 bedrm brick/mahogany modern ranch, fp, den, deck, Redwood Storage Blvd, many extras. \$69,500. 924-3178.

BELLPORT VILLAGE - Old house in perfect cond, 2 blocks to stores, easy to heat, low taxes. Asking \$39,990. Tom Honnett, 286-8945.

SHOREHAM - 4 bedrm cape, fenced corner lot, 2-car garage, 1/2 bsmt finished, low tax, must see. \$37,900. Ext. 2612, 928-8251.

SHIRLEY - 3 bedrm ranch, oversized garage, 75 x 100 cyclone fenced yard, OHW, all appl. \$31,000. Pat, Ext. 2877.

E PATCHOGUE - Durkee area, spacious 4 bedrm, fp, 2 baths, glassed porch, ac, s&s, 160 x 237 part wooded. Asking \$67,500. 475-6916.

SHOREHAM - Immac 3 bedrm, den, 1 1/2 baths, w/w carp, landscaped & fenced. \$37,500. 821-0761 after 5:30.

SHOREHAM N - Arch designed ranch, 3 bedrm, 2 fp, 2 baths, w/w carp, s&s, bsmt, priv beach, extras. \$65,000. 744-7877.

ROCKY POINT - Custom cape, quiet area, attached garage, 2 bedrm, fp, full cellar. \$32,000. Ext. 4068, 473-3171.

MASTIC - 3 bedrm ranch, 1 1/2 bath, corner lot, near water, covered patio, fenced, immac. Low 30's. 281-7531.

MEDFORD - Birchwood Blue Ridge, 1 bedrm, w/w carp, clubhouse priv, etc. \$29,500. 732-5252, 286-0838 eves.

SHOREHAM N - 4 bedrm lg colonial, 2 1/2 baths, den w/fp. \$55,000. 744-3660.

WADING RIVER - 3-4 bedrm cape, 3/4 treed acre, fp, w/w carpet, full bsmt. \$51,900. 929-8313 after 5:30.

For Rent

APT FOR RENT - Patchogue area, 2 bedrms, kitchen, living rm, private entrance. \$250/mo (incl heat). Walt, 2907, 698-0576.

SHOREHAM VILLAGE - 4 bedrm, furn, all appl, fp, wooded 3/4 acre, beach, tennis rights, avail Sept 1, 1 yr lease. \$400/mo. Ext. 3225, 744-3350.

PECONIC BAY - 7 rm house & garage, near bus, yr round rental. \$225/mo. Gen, 722-4862.

PATCHOGUE - Studio apt, furn, in priv house, separate entrance, quiet, faces garden, ac, util incl, walk to rr. \$200/mo. Ext. 4786.

MEDFORD - Newly decorated 3 bedrm apt, priv entrance. 475-4541.

SHOREHAM - 3-4 bedrm furn ranch, beautiful grounds, near beach, avail 9/1 for 10 months. 744-6804 after 6.

SHOREHAM - 3-4 bedrm cape, garage, appl near beach, avail mid July. \$250/mo + util. 928-8251.

SHIRLEY - 5 rm house, fp, garage, near water. \$270/mo. 281-5328.

E SETAUKET - 2 rms in lg house for single persons. \$90 or \$100/mo. 928-2954.

FURN APT - For couple, no children, or 1 person. Ext. 2907, 286-9051 eves.

Wanted

CORRELLE - Blue or white for green, 8 place settings & extra pieces. 331-1203 after 5:30.

MEN'S BICYCLE - 5 or 10 spd, good cond, reasonable price. Ext. 3712.

FISH TANK - 10 gal for young boy, reasonable. 289-0687.

VW TRAILER HITCH - Bob, Ext. 4637, 692-8659.

ON SITE BABYSITTER - For 2 yr old boy, 8:30 - 5:00. Ext. 2969, 744-6532 after 5:30.

APPLIANCES - Refrig, stove & dishwasher, good working cond, harvest gold, also want washer & dryer, prefer harvest gold. ASAP. Kay Hunt, Ext. 2871, 2883.

HOME - Young female cat, house trained, seeking a good home by Aug 1. 286-8807 eves.

OLD COMIC BOOKS - For my son the collector. Plotkin, Ext. 4717.

GOOD HOME - For kittens, part Persian, free to good home. 751-5652 or Ext. 3069.

PERSON WHO BORROWED - Portable Amplivox P.A. system from Public Relations, please return it or call us. Ext. 2345.

DONATIONS - Used bikes, games, sporting equip, typewriters, etc, for Smithaven Ministries' Seabury Barn annex, children ages 12-18, contribute items your children outgrew to worthy cause, will pick up. Denise, 585-9816.

STUDIO OR 1 BEDRM APT - South shore, single female. Kim Colichio, Ext. 2871, 475-6728.

POSITION - As mother's helper or babysitter for summer, experienced, references. Debbie, 727-5194.

PORT-A-CRIB - Reasonable. 281-7763.

ALUM POOL LADDER - Also extension ladder, at least 26'. 588-5833.

HOUSEMATE - July & Aug, Centereach. \$95/mo. Paul, Ext. 2071, 588-5274.

TYPEWRITER - Must be reasonable and in good cond. Ed, 727-3608.

HOME - For lovable 1 yr old cat, leaving town and there is only one alternative. Ext. 3525.

Car Pools

CORAM - Additional members for 2-person car pool, vicinity Canal Rd & Coram/Mt Sinai Rd. Bob, Ext. 3312.

CORAM - Join existing car pool. Alan, Ext. 2252.

Services

ROOM & BOARD - For elderly ladies, ambulatory and semiambulatory, qualified personnel, family type environment, 24 hour supervision, lovely north shore home and grounds, seasonal or permanent arrangements, Setauket area. 751-5652.

CAR WAXING