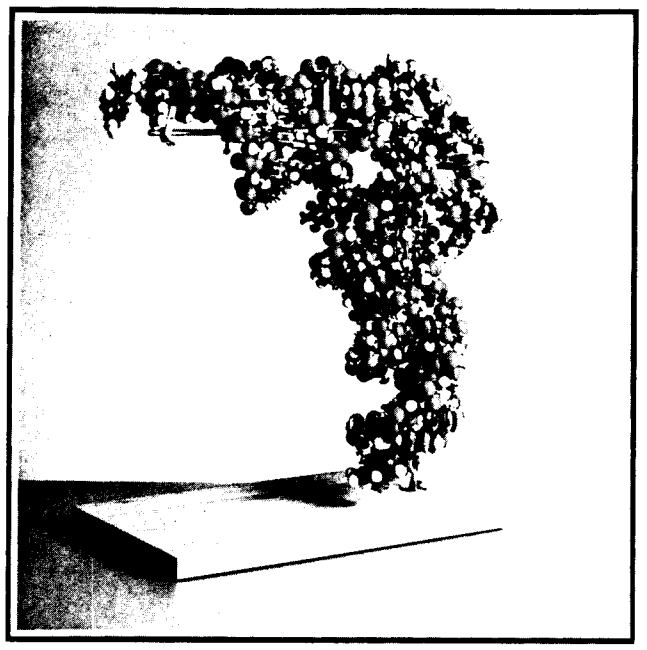
BROOKHAVEN BULLETIN

Vol. 38 - No. 11 March 16, 1984

BROOKHAVEN NATIONAL LABORATORY

Peter Horton

Enrique Abola, Frances Bernstein, and Thomas Koetzle



A space-filled model of transfer RNA built from components of the Academic Press/ Molecular Design Inc. molecular model system, using atomic coordinates obtained from the Protein Data Bank. For the instruction booklets used for step-by-step assembly, the PDB also supplies plots in the model scale showing the backbone and selected atoms, complete lists of torsion angles from the best available data, and lists of possible hydrogen bonds.

Data Bank Increases Assets

You are a scientist studying the structure of biochemical compounds using x-ray diffraction analysis. Recently, you have determined the geometric arrangement of a molecule having over 1,000 atoms. You wrote a paper explaining your interpretation of the x-ray diffraction data and the molecule's structure. A journal will publish your paper, but not the information on which you based your interpretation. They don't have space for the over 1,000 sets of three-dimensional coordinates which describe the location in space of every atom in your macromolecule. What do you do with the data? You deposit it in the Protein Data Bank (PDB).

The Protein Data Bank is a computerized archive for macromolecular structures funded by NSF and NIH. The PDB is located in the Chemistry Department, and the Bank "tellers" who solicit and receive, standardize, verify, and process the data are Enrique Abola, Frances Bernstein, and PDB Director Thomas Koetzle. The PDB has increased its holdings from seven protein structures in 1973, when it was founded, to 247 structures of proteins and other large biological molecules having approximately 1,000 to 10,000 atoms. Eighty-three sets of experimental diffraction data and 72 bibliographic entries are also on magnetic tape at the Bank. Unlike most data banks, which are computer compilations of material abstracted from the literature, the PDB contains data never published in the open literature.

The data is distributed worldwide on magnetic tape or microfiche, and is purchased by crystallographers, biochemists, molecular biologists, among others. Many users are attempting to predict the structure of molecules related to compounds on file at the Bank. "There are a lot more proteins whose amino-acid sequence is known but whose structures have not been solved," says Abola.

If your paper on the geometric structure of a biological macromolecule were to be published by the journal of the International Union of Crystallography, Acta Crystallographica, then you would be required to deposit your data with the PDB. "The IUCr Commission on Journals recommended this arrangement in 1981, and for the 3 1/2 years that it has been in operation, it has been a big help to us in acquiring data," says Koetzle.

Though the availability of data through the Bank is a precondition for publication in Acta Cryst., the judging of a manuscript's suitability does not involve the PDB. "While a manuscript is being considered for publication by Acta Cryst., we process the data," explains Koetzle. "The data set must be acceptable to us and the depositor before it is released. If the paper receives favorable review, then the data must be ready upon publication. If the paper is not approved, then the author has the option to withdraw the data from us, or go ahead with its distribution.

"We hope that other journals will follow Acta Cryst.'s lead in establishing structure deposition in the Bank as a condition for publication," says Koetzle. "We are always involved in discussions with other journals," adds Abola. "Right now the Journal of Biological Chemistry informs its contributors that it 'strongly recommends' that they deposit their data with us."

In addition to obtaining data through Acta Cryst., the PDB gets many structures through informal contacts within the field of crystallography, by scanning the journals and making requests, and from attending conferences. "We haven't received data so far for our bibliographic entries, but we know that the structure of the molecule exists to sufficient accuracy that we would like to have it in our files," says Koetzle.

When the Bank obtains data from an investigator studying structures of biological macromolecules, they first transform the sets of points so they conform to the standard x, y, z coordinate system of the data base. "We developed the format, and switched all of our data to it in 1976," says Koetzle. "Crystallographers are realizing the convenience of using our format for external communication. Our task is becoming easier because we are starting to get data in our format."

Once in standardized form, the information is verified by seven diagnostic computer programs written by Abola, Bernstein, and Agnes Abola, PDB technical collaborator and wife of Enrique Abola. "We do systematic checks of each molecule's geometry," explains Bernstein. "The distances between certain atoms should be within specified limits; we compute those distances, and if they fall out-

(Continued on page 3)

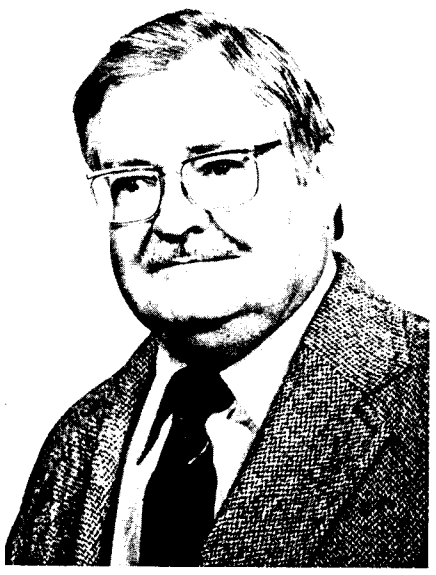
Sayre and Harbottle Receive Hevesy Medal

Garman Harbottle and Edward Sayre, both senior chemists in the Chemistry Department, have been named joint winners of the 1983 George Hevesy Medal. This honor recognizes their pioneering work in the application of nuclear techniques to art and archaeological problems. As recipients of the Hevesy medal, Harbottle and Sayre join about a dozen scientists from around the world who have been so honored.

The George Hevesy Medal was established in 1968 by the Journal of Radioanalytical and Nuclear Chemistry, for outstanding contribution to the field of nuclear analytical chemistry. It has been given to fourteen other scientists since 1968. The award is a tribute to the memory of George Hevesy, a pioneer of radioanalysis. Hevesy, along with Hilde Levi, originated the method of neutron activation analysis in 1935.

The medals will be presented on April 2 at the 5th International Conference on Nuclear Methods in Environmental and Energy Research, in Puerto Rico.

Sayre was the first to apply neutron activation analysis to art and archaeology. He was later joined in this work by Harbottle. The method is useful for determining the origin, date, method of manufacture and authenticity of artwork and archaeological pieces.



Peter Horton

Edward Sayre

More recently, Sayre and Harbottle, along with senior chemist Raymond Stoenner, have developed a small carbon-14 counter, which can be used to date objects with very low carbon content.

Ed Sayre received a Ph.D. from Columbia University in 1949. After three years at the Eastman Kodak Research Laboratories in Rochester, he came to BNL in 1952. Because of his scientific expertise in art and archaeology, his advice is sought around the world. For example, he was a member of the American team sent to Florence, to help rescue works of art after the 1966 flood. From 1969-70, he was at the American University in Cairo, as a distinguished visiting professor. In addition to his research at Brookhaven, Sayre is also Head of the Research Laboratory at the Museum of Fine Arts in Boston.

Gar Harbottle has been on the staff at Brookhaven since 1949, after receiving his Ph.D. from Columbia University in the same year. From 1957-58 he was a Guggenheim Fellow at Cambridge University in England. A year later, he was at the American University in Beirut, to teach radioisotope procedures. In 1965 he went on leave for two years to direct the Division of Research and Laboratories at the International Atomic Energy Agency in Vienna. Locally, Harbottle is a member of the Suffolk County Vanderbilt Museum Commission and a trustee of the William K. Vanderbilt II Museum and Planetarium.

Doug Humphrey

Garman Harbottle

Peter Horton

Last week, the Laboratory administration hosted a party at the Center to mark the first year of the Employee Suggestion System. Award winners, their spouses and co-workers were in attendance. During this first year, 196 suggestions have been received of which 24 have been approved for implementation. To date, the cash awards have amounted to nearly $4,000, with the cash value of six approved awards still to be determined. Above, award winners Ed Iberger (left) and Pat Andrisani (second from right) talk to Associate Director Vincent O'Leary and Mrs. Iberger at the reception.

Equipment Demo

On Monday, March 19, Hewlett-Packard will present a computer hardware and software exhibit in the lobby of Berkner Hall from 10 a.m. to 3 p.m. Featured will be demonstrations of HP workstations (16 and 32 bit HP-UX based systems), mini computers, peripherals and instrumentation. Software in the areas of drafting, circuit simulation, engineering graphics and design and document preparation will be shown.

Lecture Reminder

Computer networking will be surveyed by Graham Campbell, Senior Computer Scientist, Applied Math Department, in the next Brookhaven Lecture. His lecture, "The Computer Connection," will be given at 4:30 p.m. on Wednesday, March 21 in Berkner Hall.

Volunteers Needed

A study of migraine headaches using the PETT (Positron Emission Transaxial Tomograph) methodology for measuring the regional glucose metabolism in the brain will begin soon at BNL. Males, at least 18 years of age who suffer from migraines are needed as volunteers for these studies. For further details and to determine suitability of candidates, contact Dr. Howard Sachs, Department of Neurology, SUNY at Stony Brook, tel. 444-1432.

Missing

A six-volume set of "Comprehensive Organic Chemistry: The Synthesis and Reaction of Organic Compounds," Pergamon Press 1979, is missing from the Research Library. It would be appreciated if the borrower would please return the books as soon as possible.

Tennis Troubles? Get a New Racket!

Howard Brody admits to being a mediocre tennis player. Several years ago, he saw a way to improve his game. It didn't involve hours of practice on the court; instead, he put the time into paper calculations and lab experiments.

Brody is a professor of physics at the University of Pennsylvania in Philadelphia. He has had a long association with BNL, coming here to do experiments first on the Cosmotron and then on the AGS. Recently, Brody was on site to give a talk, not on the physics of particles, but on the physics of tennis.

Brody's advice for all you tennis buffs is simple: get a new racket. While that may sound like a well-worn excuse for a lousy game, Brody backs up his statement with empirical data.

He was first inspired to apply physics to tennis when he saw a Prince racket, which has a head almost 50% bigger than a normal racket. Until this racket came out on the market, the basic shape and size of tennis rackets had not changed in over half a century. There have been a few new ideas, like metal frames instead of wood, but in general, racket manufacturers have been reluctant to make drastic changes which would require a player to relearn the game.

Even the Prince racket, with its larger head, has the same overall length, weight and balance as a conventional racket. An average player can easily switch to a Prince because it feels like a normal racket.

To understand the advantages of such a racket with an oversize head, Brody examined a number of rackets both theoretically and experimentally. He found that a racket has three points, or sweet spots, where the ball should be hit for best results:

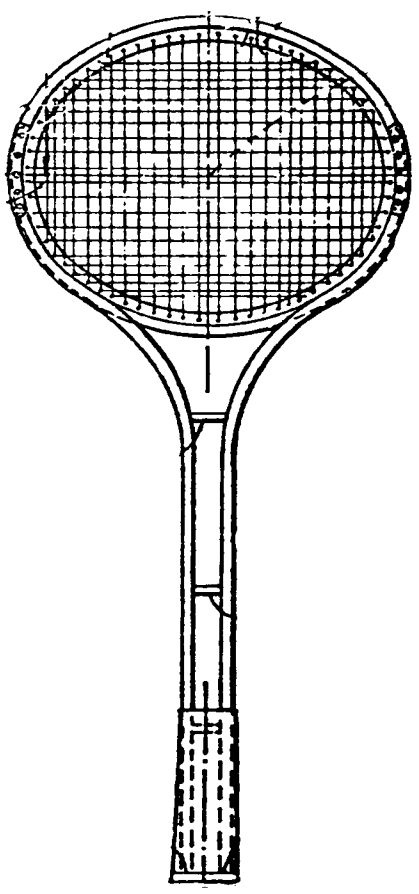
- The center of percussion is the point where the ball is hit and causes no shock to the hand. For a normal racket, held at the handle, this point is five or six centimeters below the center of the head. To hit at the center of percussion, the player must either choke up on the handle five or six centimeters or hit the ball closer to the throat of the racket. Of course, another option is to extend the racket head down toward the handle.
- The coefficient of maximum restitution (COR) is that area on the racket face which maximizes power. Brody found that two factors combined to give the greatest COR — a stiffer frame and lower string tension. The latter goes contrary to the conventional theory of stringing, which starts the beginning player with looser strings to help ball control and later moves the player toward tighter strings for more power. Instead, Brody's analysis found that the higher the string tension the more the ball deforms upon impact, hence the more energy the ball dissipates. As to a stiff frame, less energy is lost to frame deformation. Although there are a number of ways to increase the COR of a racket, one way is extend the head of the racket toward the handle and hit closer to the handle in ground stroke play and higher when serving.
- The node is where there is minimum vibration in the racket. The position of a racket's node is affected by the mass distribution of the frame and the relative flexibility of various parts of the frame (some rackets have stiff heads and flexible shafts, some are just the opposite, and some are uniform).

Generally, rackets have their sweet spots in different places. The ideal racket would have all three spots in the same place, with a power region and a nodal region covering most of the racket face.

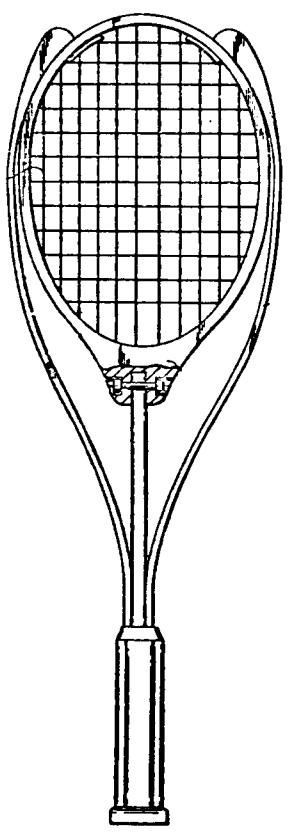
Clearly, though, a racket with a large head does have advantages. Brody says the Prince may not even be big enough, although if a racket of conventional length, weight and balance is desired, then the Prince is a definite improvement.

After all this analysis, did Brody's game improve? He says that had he put in an equal amount of time on the tennis court, he'd be a good player today. — Mona S. Rowe

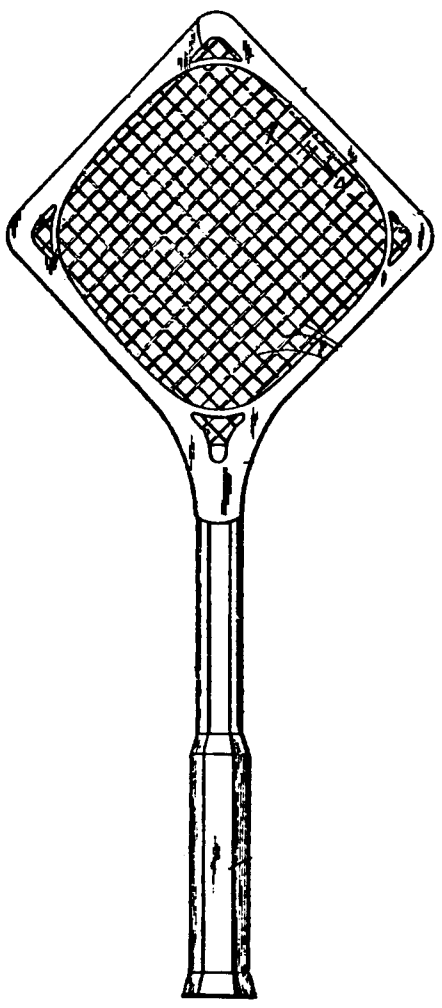
Tennis has been played for almost a hundred years. The standard popular wood racket has an elliptical head formed by wood laminations joined to the end of a handle. Here are some tennis rackets, unique enough to be successfully patented.



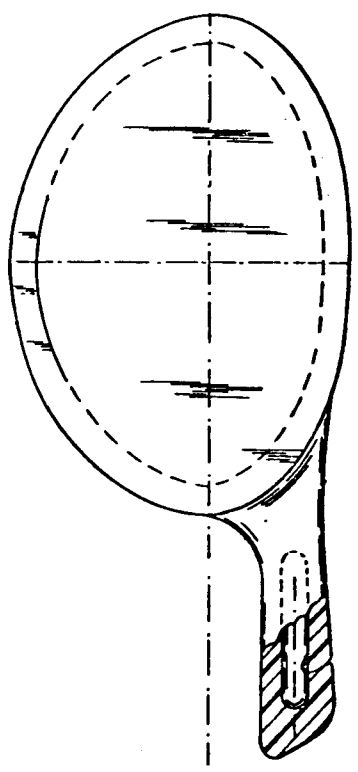
The racket is constructed of magnesium, beryllium or other metal with a low ratio of weight to stiffness and strength. The elliptical head of the racket is arranged so that the long axis of the ellipse is transverse to the axis of the racket handle, thereby increasing the rotational moment of inertia about the longitudinal axis of the racket.



The shaft of the racket is split between the handle and the head into two basic parts, so that the first part cantilevered from the grip supports the head at its inner end, while the second part supports the head at its outer end. The two shaft parts are unconnected so that they will flex independently of each other to maintain the head generally parallel with the axis of the grip.



The frame has a generally square head. The racket is strung so that each string length spanning the head extends perpendicularly from where it is supported. This provides a ball striking matrix of equal length and equally tensioned string reaches.



This is a racket for a game similar to tennis but not employing a net. The racket consists of a main body formed by a rigid ring with thin but resilient panels secured on opposite sides of the ring, defining a sealed air chamber in between. The ring has a handle offset from the center line of the racket, which improves control of the racket and relieves wrist tension. The sealed air chamber adds to the bounce characteristics of the racket by acting as a resiliently compressible gas cell. The impacted panel distorts to a greater degree than the opposite panel, causing compression of the contained air, which then immediately expands and drives the ball.

BROOKHAVEN BULLETIN

Published weekly
for the employees of
BROOKHAVEN NATIONAL LABORATORY

BERNICE PETERSEN, Editor
MONA S. ROWE, Assistant Editor
ANITA COHEN, Reporter
MARSHA BELFORD, Reporter

35 BROOKHAVEN AVE., UPTON, N.Y. 11973
Telephone (516)282-2345

Data Bank (Continued)

side reasonable bounds, we ask the depositor if this is correct. Even though we do all this checking, our official point of view is that the data is what the depositor gave us. It is their responsibility to make corrections." Adds Koetzle, "Once the data is released, if a user informs us of a problem with a data point, we first look for clerical errors, and then inform the depositors of the problem and ask them for a resolution."

New data is released with the old, and sold for about $200 for the tapes and $125 for the fiche. Last year the Bank received 118 orders; it also distributes its product through three centers: Cambridge, England; Victoria, Australia; and Osaka, Japan. The PDB updates its offerings quarterly, adding 12 to 15 new structures, and replacing old with revised data. Eleven hundred users world-wide receive a six page newsletter, with order blank, quarterly.

Beginning this year, users can order just a "yearbook" of new or revised data for the year 1983, 1984, and so on. "Until now, we distributed only the entire data base," says Bernstein. "This new service should make it easier for users who have purchased tapes or fiche from us in the past to stay current. They also will avoid having to reprocess all the still current data that they've already received." "If you think of the Bank as an encyclopedia, it could grow without bounds, and get exorbitantly expensive to totally replace on an annual basis," comments Koetzle.

"We have processed more data than 247 entries because we are willing to take data in an early stage, and encourage the depositor to revise it in time," explains Bernstein. "We have about 100 obsolete versions that have been superseded by better data." "Some of the earlier data doesn't measure up to the data we are now getting," comments Abola. "Protein crystallography is an evolving field, and people are still learning how to get better data."

"The funding agencies support the processing of the data base, and the writing of associated computer programs," says Koetzle. "Because most of our users are interested in only a few entries, and want to do some rather extensive computer manipulations of the data, we have written programs to help them extract information from the file. When the data base goes out to the public, the source code for these programs is included with the data and bibliographic entries. The sale of our product to outside users pays for the distribution costs."

"The scientists who deposit structures in the PDB are protein crystallographers," says Bernstein. "A third of those using our data are also crystallographers; one third are biochemists and molecular biologists studying proteins in a more general fashion; and a third of our users do miscellaneous things with our data, like college professors using it for teaching purposes." The Molecular Design Inc. division of Academic Press, an Orlando, Florida textbook publisher, uses the Bank's data and computer programs to build models of structures using their commercially available kits.

"Pharmaceutical firms interested in receptor studies use the data base to draw pictures of these large biological molecules," explains Koetzle. "These companies may study how drugs fit into the active part of molecules, thus modifying their function. They use this information as a guide in the search for new drugs." According to Koetzle, a trend has been for scientists trained in protein crystallography to move into commercial institutions; as a consequence, the PDB has numerous users from the private sector.

"We are no longer exclusively involved with proteins," adds Koetzle. "We are called the Protein Data Bank because the first structures that were solved and that we held were proteins. Now we have nucleic acids, RNA and DNA, the protein coats of two viruses, and polysaccharides as well. Since these are all biological macromolecules, we considered changing our name to the Biological Macromolecule Data Bank, but that is quite a mouthful, and doesn't have the zip that the name Protein Data Bank has." — Marsha Belford

Peter Horton

Team captains of the 1983 champion teams admire the League's new standing trophy now on display in Berkner Hall. From left are Ken Rogers (League II: Roga); Bob Brown (League III: Survivors); Walt Chornoma (League I: Blue Jays); and Louise Chinn (League IV: Source). Each year the names of the winning teams will be inscribed on a plaque, and photographs of the winning teams will be displayed with the trophy. Planning for the 1984 season has begun and any team wishing to submit a roster should call Sharon Smith, Ext. 3995, for a form. No new teams will be accepted unless a team from the 1983 season drops out of the league, so for newcomers it's first come, first served. For planning purposes, all teams should file an intention-to-participate roster with Smith no later than April 11. No rosters will be accepted without life numbers.

PSI News

Police Officer John Thomas, Suffolk County Police Department, will speak at the next meeting of the Upton Chapter PSI on March 19 at 6 p.m. in Room C, Berkner Hall. He will discuss the prevention of sexual assault. The meeting is open to all employees.

Stony Brook Events

March 20 7 p.m.	"Skydiving: How to Begin," Rory Aylward, U.S. Parachute Assoc., Room 214, Stony Brook Union.
7:30 p.m.	Ousmane Sembene's "Mandabi," a film of Senegal. Lecture Hall 102.
8 p.m.	Lecture by Saunders MacLane, Univ. of Chicago, "Scientific Advice on Government Policy: Can it be Objective?" Room 001, Earth and Space Sciences Bldg.
March 22 8 p.m.	Lecture "Joseph the Rainbow King: Biblical Archaeology and Ecology," Michael Kenny, Simon Fraser University. Room S-528, Social and Behavioral Sciences Bldg.
March 23 8 p.m.	Nickolais Dance Theatre. Main Stage, Fine Arts Center. Tickets $12, $10, $8, $2 discount for students and Sr. Cits.

Walking For Health

Each year the March of Dimes has a Teamwalk to raise money for its program aimed at the prevention of birth defects. In 1983, 168 Long Island companies sponsored a team of their employees to participate in the walkathon.

This year, the Laboratory is considering organizing such a team, and would like to know how many employees would be willing to put on their track shoes and walk, not run, for the March of Dimes.

The walk is 30 kilometres (18 miles) and starts from Eisenhower Park in Nassau; and at Smith Haven Plaza, Lake Grove, in Suffolk. It will get going at 8:30 a.m. on Sunday, April 29. Walkers may go the distance, or as much as they are able.

This is the way it works: walkers find sponsors among their friends and relatives, who agree to pay them so many cents or dollars for each mile they walk. The money thus collected is turned over to the March of Dimes.

Brookhaven employees who wish to participate in Teamwalk are asked to sign up at the BERA Sales Office in Berkner Hall, or at the Recreation Office in Personnel, by March 23.

Cafeteria Menu

Week Ending March 23

Monday, March 19		
Potato leek soup	(cup)	.65
	(bowl)	.85
Chinese pepper steak on rice		2.00
BBQ pork chop w/1 veg. & applesauce		1.95
Hot Deli: Oriental burger	(bread)	1.85
	(roll)	2.00
Tuesday, March 20		
Beef barley soup	(cup)	.65
	(bowl)	.85
Southern fried chicken w/1 veg. & cranberry sauce		1.95
Turbot Florentine & 1 veg.		1.95
Hot Deli: Grilled reuben		1.90
Wednesday, March 21		
Navy bean soup	(cup)	.65
	(bowl)	.85
Spanish pot roast & glazed carrots		2.00
Sweet & sour pork on rice		1.95
Hot Deli: French toasted ham & cheese club		2.15
Thursday, March 22		
Chicken vegetable soup	(cup)	.65
	(bowl)	.85
Veal scallopine on egg noodles		1.95
Tuna noodle casserole & 1 veg.		1.85
Hot Deli: Chili dog		1.90
Friday, March 23		
Seafood chowder	(cup)	.65
	(bowl)	.85
Fish & chips		1.90
Egg & broccoli au gratin & 1 veg.		1.85
Hot Deli: BBQ top round of beef	(bread)	1.95
	(roll)	2.10

MICOM Meeting

The next meeting of the MICOM Users' Group will be on Wednesday, March 21 at 3 p.m. in the conference room of Bldg. 179A (Department of Applied Science). MICOM representatives Ruth Stannish and Eileen Rhiel will be present. Topics to be discussed and demonstrated on the 3000 are records processing, applications set-up, and possibly communications. For further details, call Isabelle Harrity, Ext. 3727, or June Martino, Ext. 2933.

Quilting Club

The Quilting Club will meet on Tuesday, March 20, from 9:30 - 11:30 a.m. in the lobby of the Brookhaven Center. There will be a fabric swap so bring your fabric scraps to exchange and a scrap quilt will be planned. For more information, call Bernie Benz, 928-1068.

Arrivals & Departures

Arrivals

Kenneth J. Buckelman .... Chemistry
Janice DePass ..... DAS
Linda E. Greves ..... Saf. & Env. Prot.
Danny J. Mizesko ..... Plant Eng.

Departures

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

Peter J. Schirmer ..... Mgt. Info. Syst.

Horsemanship Clinic

The Suffolk County 4-H Horse Clubs are holding a Horsemanship Clinic on Saturday, March 24, from 9 a.m. until noon, at the Suffolk Meadows Arena, Coram. The clinic is especially designed for young riders and is open to the public.

The topics to be covered are bandaging, braiding, clipping and first-aid. Admission is 50¢ for children under 14 years and $1 for adults.

Bowling

Pink League

M. Apelskog rolled a 190, S. Asselta 186. The Survivors are in first going into position night but the Squealers are a close second.

Red/Green League

High games were bowled by J. Morris 220, A. Lorentsen 213, A. Pinelli 211, G. Meinken 202, J. Medaris 200.

White League

J. Griffin had games of 237/224 for a 647 scratch series, A. Pinelli 205, R. Eggert 203, V. Manzella converted the 6/7 split, R. Sheehan 211, K. Griffin 191. No Cigar in first place after position night.

Purple League

The Purr Haps are in first after position night. High games were bowled by J. Ferrante 259, K. Asselta 244, G. Hassell 215/221, J. Roesler 212, A. Stonebridge 164.

L.I. Industrial Tournament

Representing BNL in the Hempstead Tournament are R. Larsen, J. Morris, D. Adams, E. Sperry IV, K. Riker, R. Jones.

Runners Corner

The club will meet on Wednesday, March 21, at noon in Room A, Berkner Hall, to discuss plans for the year, including the spring races on May 20. All runners, whether beginner, middle of the pack, or world class, should plan on attending the meeting. Bring your lunch. For information, call Jeanne Penoyar, Ext. 2614.

Classified Advertisements

Placement Notices

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

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

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

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

OPEN RECRUITMENT: Opportunities for Laboratory employees and outside applicants.

2028. DESIGNER POSITIONS (4) - Requires a minimum of 5 years' demonstrated experience in mechanical design fundamentals, including optical, vacuum and mechanical components. An AAS degree in machine design or equivalent background desirable. National Synchotron Light Source Department.

2029. PATROL OFFICER - Requires AAS in criminal justice or equivalent experience performing diverse security duties for a large organization. Excellent communication skills are necessary as well as ability to work shifts. Will participate in comprehensive training program in order to become knowledgeable of site and police procedures. Safeguards and Emergency Services Division.

2030. TECHNICAL POSITION - Requires several years experience performing functions relating to electronic fabrication, assembly and testing as well as experience in drafting and documentation of electronic circuits. Applied Mathematics Department.

LABORATORY RECRUITMENT: Opportunities for Laboratory employees.

2031. OPERATION COORDINATOR - Requires BS degree or equivalent in physics or electrical engineering. Experience with power supplies, computer controls, peripherals and/or RF systems desirable. Responsibilities include troubleshooting, liaison with experimenters, electronics design and/or programming and supervision of AGS shift operations. Rotating shift work. Accelerator Department.

Autos & Auto Supplies

67 VOLVO - runs, many new parts, needs little work, $250. Rose, 744-5069.

GERMAN AUTO PARTS - wholesale prices on new parts for VW, Porsche, Audi, BMW & MB. Augie, 289-4211.

72 DODGE SWINGER - V6, auto., body good, new tires, new brake, needs engine work, $200. Tian, Ext. 4157.

70 IMPALA - runs well, front suspension damaged, barely driveable, best offer. Walter, 4986.

SEARS CAR TOP CARRIER - X-Car-Go, never used, fits any car, $80. Al, Ext. 2075 or 281-6617 eves.

74 TOYOTA P.U. - longbed, 89,000 mi., runs well, rusted, minor collision damage, $500. Ext. 3458, 369-2504

80 KAWASAKI - 650 LTD, red-crash bars, excel. cond., must sell, $1500. Bob Johnson, 475-2305, 283-4741 after 6 p.m.

TIRES - (4) H78-15, $5/ea. (1) new snow, $15 on Jeep rims. Rich, 821-0354 after 7 p.m.

74 CHEVY - V8, runs well, am/fm, p/s, p/b, $650. 821-0758, 6 to 8 p.m.

81 FORD P.U. - F250, auto/overdrive, 30,000 mi., excel., $6,000. Slim, Ext. 3084.

77 VOLARE - 4 dr., a/c, 6 cyl., cruise control, mint cond., $1900. 475-4428.

73 CHEVY IMPALA - runs well, $250. Joe, Ext. 4661.

76 DODGE ASPEN - 6 cyl., red, good cond., $1500. 722-8802.

71 CHEVELLE SS - rebuilt 350 motor, new clutch, headers, turbo mufflers, 4-sp. power steering, a/c, must see. 363-2532 after 6 p.m.

70 OLDS CUTLASS - new heads, timing, chain & exhaust, excel. trans. Joe, 929-4919.

75 VOLVO - 4 speed w/overdrive, runs well. 585-7244.

71 MERCEDES - 220/8 auto, running, excel. for restoration, good body, $3200, neg. 281-4871 eves.

78 FAIRMONT - 6 cyl. a/c, p/s, am/fm/tape, 3 speed stick on floor, $2300. 234-9630.

71 CHRYSLER NEWPORT - runs fine, 3 new tires, best offer, Rich, Ext. 4363, 924-7238 or 286-1183.

56 CHEVY - radiator, sell or trade; 62 Chevy parts, bumpers, windshields, many others. Joe, Ext. 2556.

68 PLYMOUTH VALIANT - 6 cyl., 3 spd. standard, 4 dr. sedan, good cond., $425. Rich, 924-8224 eves.

75 HONDA - red, 400 cc, fairing, sissy bar, and luggage bags, garaged. $625. 467-8563 after 7:30 p.m.

79 HONDA - 750F Super Sport, 3000 mi., profess. maintained, polyglycoat, garaged, $1650. 759-2460, 473-7809 eves.

SNOW TIRE - mounted on Pontiac rim F-78-14, good cond., $5. Morris, Ext. 4986.

78 TOYOTA COROLLA LIFTBACK - a/t, am/fm/cassette, high mi. but good cond. and dealer maintained. Pat, Ext. 4628.

77 CHEVY VAN - small V8, fully customized camper pkg., many extras, $1950. 821-9280.

CHEVROLET SHOP MANUAL - 1949-1953, perfect cond. $8; 1973 Honda Shop Manual, $7. Morris, Ext. 4986.

SNOW TIRES - (2) H78-15, studded on Olds rim, $35/pair. Paul, Ext. 4309.

78 HONDA MOTORCYCLE - 4 cycle, 5 speed, low mi., $850; 1975 Honda Motorcycle, CB, 400F, 6 spd., 4 cycle includes fairing, $650. 467-8563 after 7 p.m.

78 FORD FAIRMONT - 2 dr., auto., a/c, am/fm, excel. cond., 66k mi., $2300. Ext. 2609 or 3009.

MAG WHEELS - (4) silver, 13"x5½", 4-lug. with (4) Goodyear Eagle NCT P185R70 tires mounted, $300. Eric, 289-2352 days.

73 DODGE SWINGER - excel. running cond., $500. 758-6291.

74 VOLVO - 145, auto, stereo, very clean in & out, $2300. Sue, 744-2653 days, Ext. 3305 after 4:40 p.m.

72 VW SQUAREBACK - runs well, good trans., $750. 286-1183 or 924-7238.

82 KAWASAKI MOTORCYCLE - 440, belt drive, blue, mint cond., low mi. Richard, 924-3476 after 6 p.m.

FIRESTONE DELUXE CHAMPION RADIALS - (5), like new, black, P195/75R15, $120. Jack, Ext. 2377, 281-2382.

83 HONDA ACCORD-LX - hatchback, 5 spd., a/c, p/s, p/b, am/fm stereo, 16,000 mi., like new, $8900. Yannis, Ext. 2435 eves., 732-6546 weekends.

77 DODGE COLT - wagon, rebuilt engine, new muffler system, must see cond., asking $2400. 589-5126.

76 DODGE PICKUP - 6 cyl., 8' bed, cruise control, stereo, hi insul. camper cap, air shocks, headers, no dents or rust, mint, many extras, $2750. 281-1933 eves.

73 APACHE - Solid State camper, new axle, beach ready, asking $1350. Joe, 4255, 289-1831.

75 DODGE DART SPORT - 340 c.i., 4 spd., cragers, Dunlop radials, new clutch, stereo, asking $1700. 732-7288.

CADILLAC RIMS - (2) 15", $15. 929-4701 or 8105.

78 BUICK REGAL - V-6, a/c, a/t, new w/w tires, wire wheels, excel., $3650 neg. 588-7989.

80 TOYOTA - 4x4 longbed pickup, fiberglass cap, 55,000 mi., extras, excel, $1400. 878-8255 eves.

71 CHRYSLER NEWPORT - runs well, 3 new tires, asking $350. Rich, Ext. 4363.

68 CHEVELLE - "Oldie but Goodie", 100,000+ mi, $500. Ext. 4207 or 286-0466 eves.

75 MONTE CARLO - good running, a/c, am/fm, 8 track, excel. cond. AT9-4689 after 6 p.m.

78 DATSUN 200SX - recent tires, brakes, shocks, alt. & water pump, 5 spd., sun roof, am/fm/cass., a/c, asking $2650. Ext. 7148.

MOTORCYCLE PARTS - for sale, discount prices; 400x18 ME99 Metzeler motorcycle tire (street), new. 329-9580 after 6 p.m.

82 PLYMOUTH TC3 - turismo, 33,500 mi, black, am/fm/cassette, 25-30 mpg, 4 spd, under warranty, $4800. Larry, 698-7353.

78 HONDA - 750 K, fairing, radio, 11,000 mi, excel., $1500, firm. Ed, 929-6798 after 6 p.m.

TIRES - (2) snow studded H78-15 with Olds rims, $38 for 2. Ext. 4309.

75 TRAILER - 24', sleeps 6, self contained, Ext. 2543, 751-2713.

74 DODGE DART - 318, p/s, p/b, a/c, 2 door, runs great, very dependable, $600. 281-7578.

Boats & Marine Supplies

16' PENN YAN - 40 hp, elec. Merc, certified trailer, extras, $2400 or best offer. Kevin, Ext. 3267.

35 HP EVINRUDE - runs, needs water pump, approx. 1958. Johnson 25 hp for parts. Bob, Ext. 5286.

30' CHRISCRAFT - twin FWC, depth finder, CB radio, and more extras, $3000 neg. 281-4871 eves.

CATALINA 25 - 4 sails, pop top, Honda 9.9 hp, o/b, VHF + many extras, asking $14,500. 473-2473 or 744-7127.

Miscellaneous

EASTER BUNNIES - choice of colors, $10. 363-6292 eves. and weekends.

BROYHILL BEDROOM SET - 5 piece set w/queen size bed, $600; 1981 G.E. 25" console color TV, cable ready, $250. 584-7544.

COLONIAL DRUMS - 3 snare, 3 tenor, 2 base, good cond. Ext. 4867, 472-1302.

SONY TAPE RECORDER - $15; popcorn maker, used twice, $15. Ext. 3701.

ANTIQUE POT BELLY STOVE - burns coal or wood, great shape, $100. 924-8224.

TELEPHONE - Stromberg-Carlson, rotary, black, working order, $5; bassinet, white, good cond., $15. Ext. 2492.

6 DIAMOND TW ENG. SET - 14K, $200; men's 3 diamond wed. ring, 14K, $175. Ext. 2272.

10" MCCULLOCK CHAIN SAW - excel. cond., in wood box, w/extra blade, $60. Morris, Ext. 4986.

MOTORCYCLE HELMET - large, w/shield, $20; 55 gal. kerosene drum w/pump, $20. Rich, 821-0354 after 7 p.m.

CATCHERS FACE MASK - new cond., $6. 727-3608 after 5 p.m.

OXYGEN CONCENTRATOR - Bunn Micro Lightest Best, cost $3000 new, asking $750 plus free extras. Saxon, 929-4701.

ANTIQUE STONE GRINDER - large wheel; Gravely sulky, reasonable. Ext. 3688.

BEDROOM SET - girls, white, db. dresser, chest, desk, chair, night stand, $225. 585-7030 before 2 p.m. or after 6 p.m.

COLD WATER STORAGE TANK - 42 gal., glass lined, 3 mos. old. 286-8751 after 6 p.m.

DOLLS - huggable 16", $18; clothes for cabbage patch dolls, boys or girls, $3.50 up. 737-0246.

COLONIAL LOVESEAT COUCH - rocker, coffee table, end table, lamp, $300. 722-8802.

LEARN RADIO CODE! - 10 lesson record album, like new, $7. Morris, Ext. 4986.

BICYCLE - girls 26" Iverson, blue, 10 spd., very good, $40; 2 cots for camping. $5/ea. Fred, Ext. 4988.

3-PHASE ELECTRIC MOTORS - (2) 5 hp. 289-0967 after 5 p.m.

TENNIS RACKETS - Rosignol Pro, $20; Head Comp, $25. Joe, Ext. 4139.

HAM OPERATORS - HW16 transceiver, VFO, antenna tuner, SWR meter, coax switch, $200. Oster, 589-2648.

STOVE - G.E., 4 burner, 30", w/rotis., free standing, v.g. cond., aqua, asking $100. 281-7720.

BATH FIXTURES - American Standard, porcelain, yellow color toilet, attached tank and sink, $100. 941-4011.

CEILING TILES - used, industrial, white, insulating, 24x48⅝ thick, 65 tiles, $25. Ext. 2981, 473-7809.

LAWN MOWER - 4 hp, self propelled, rear bagging, $125. 744-9677.

ELECTRIC GUITAR - Cortez, solid body, Les Paul style, gold, $150; AMP Hohner, 80 watts, pre amp, reverb, 12" speaker, $225. Ext. 4532.

MOVING - must sell, freezer, washer, dryer, dishwasher, best offer. R. Peck, Ext. 3145.

CALCULATOR - Sharp EL5813, wallet-size, LCD display, programmable, 30 steps, 7 memories, $15. Ext. 3242 or 7192.

RCA COLOR TV - 25" console, working cond., needs new tubes, $25. Joe, Ext. 2575, 281-2767 eves.

HIKING BOOTS - Wolverine, 7½ med., new, sacrifice, $35. Gene, Ext. 3354.

APPLIANCES - new G.E. 14 cu. ft. refrigerator, white, $350; like new Maytag washer & dryer, harvest gold set, $425. Ext. 5139, 348-7884.

ORGAN - Yamaha E-30, double keyboard, ft. pedals, auto, chords, rhythm section, Leslie speaker, mint, $2900. 286-1358.

BLENDER - Waring 7 spd. without glass container, $7; Sanyo rice cooker, keep warm feature, excel., working cond., $20; cane rocker, natural finish, $10. 929-3566.

HUNTING BOW - 45 lbs., $30. 399-1679.

HOT TUB SPA - new, self contained, water jets, bubbling ports, 115V heater, 175 gal. Rob, Ext. 7199.

RACING HANDLE BAR - chrome, ram style, for 10 spd., new cond., $2. 727-3608 after 5 p.m.

LADIES WEDDING RING - 14K gold w/1 pt. diamond, size 4½, very pretty, $65. Ext. 2733.

OIL TANK - 275 gal., $100; lawn mower, 3 hp, 20" cut, $50. 331-2228.

YAHAMA GUITAR - mint cond., asking $135. Joe, Ext. 4255, 289-1831.

STOVE PIPE - 8" dia., triple wall, total length 16 ft., $200; wood stove, $50. 331-2228.

VIC 20 COMPUTER - make a reasonable offer. Joe, Ext. 4255 or 289-1831.

KITCHEN TABLES - white formica, (1) 24" round, $20; (1) 30x48 incl. 8" leaf, $25; both excel. Ext. 4701, 929-8105.

STOVE HOOD - coppertone w/fan filter & light, $10. Victor, Ext. 2395.

KITCHEN DINETTE SET - French Prov., antique white w/leaf, 4 padded cane back chairs, $100. 744-3639.

LAWN MOWER - Sears rear bagger, like new, $100. 744-3639.

FUR JACKET - muskrat, v.g. cond., size M, $90. Sharon, Ext. 3995.

PIANO - upright wood grain finish, refelted strikers, asking $300. Ext. 7148 at nocn.

COLOR TV - 19" Portland, used 11 mos., $150. Ext. 2609 or 3009.

REFRIGERATOR - 12 cu. ft. Frigidaire, white, excel. cond., $100 firm. Roy, Ext. 4664 or 331-2401.

MOTORCYCLE HELMET - green, Snell approved, $30. O'Kula, Ext. 4167.

ROTISSERIE - Farberware, small size, new, asking $25; camel seat, authentic w/leather cushion & bindings, asking $30. 929-4701 or 929-8105.

SHOE RACK STAND - chrome, holds 9 pr. of shoes, new cond., $4. 727-3608 after 5 p.m.

ANTIQUE DRESSER - 4 drawer w/mirror, good cond.; wooden fireplace mantle, colonial styling. Walt, Ext. 7154.

TAPE DECK AKAI - including 20 tapes, $70. Pete, Ext. 4819, 289-7218.

ADMIRAL UPRIGHT FREEZER - 14 cu. ft., excel. cond., asking $200. 878-9582 or 475-7272 after 6 p.m.

CASTRO CONVERTIBLE - needs cover, $35. 475-4394.

ROUND TABLE - 42" dia., 4 chairs, v.g. cond., $75. Ext. 7582, 744-2499.

SAMSONITE SURVIVOR SUITCASE - largest size, maroon, used twice, $80; bassinet, wicker, $8. Ext. 4581.

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

SHOREHAM NORTH - 4 bdrm., 3 baths, 2 car, full brick wall fireplace, 3/4 acre. 821-0080 after 5 p.m.

SHOREHAM - 3 bdrm. ranch, eik, dr, lr w/fp, den, laundry rm., bsmt., shed, 1/3 acre, pool, covered patio, assumable 7½% mtg., five miles to Lab, $65,000. 744-4912.

MIDDLE ISLAND - 2 bdrm. ranch, wooded & landscaped acre, fenced & hedged, garage, fruit trees, quiet dead-end street, $69,000. R. Peck, Ext. 3145.

For Rent

MEDFORD - 1 bdrm. apt., full kit., w/w carpeting, private ent., $400/mo., incl. all util., 1 mo. security. Ext. 3336 or 475-8456 eves and weekends.

CORAM - (La Bonne Vie) 2 bdrm. apt., new lease (or sublet up to 9/30/84), d.w., cent. a.c., avail. April 1 or later, $605/mo., heat incl. Yannis, Ext. 2435 or 732-6546 eves. & weekends.

PORT JEFFERSON VILLAGE - 1 bdrm. apt., private ent., walk to shopping and harbor, June 1st occupancy, $450 + util. 331-4443 after 4 p.m.

MASTIC - near Lab, attractive and well kept 4 bdrm. house w/mod. kit., & garage (w/deck, many extras). Landscaping - charming, quiet location. Discount price is $675 + mo. 281-5605.

Car Pools

NORTHPORT FT. SALOGA - 8:30-5:00, we need one or two more drivers. Walt, Ext. 7154.

EAST HAMPTON - drivers, riders, 8:30-5:00. Rob, Ext. 7199.

RONKONKOMA - 2 drivers to join existing pool, meet near LIE, Exit 59, 8:30-5:00. Victor, Ext. 2395.

Wanted

TRAINS - Lionel, and "0" gauge or "027" gauge cars, track and equip. Frank, Ext. 3120.

EXERCISE BIKE - used, reasonable. Ed, Ext. 3931, 722-4467.

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

OLD BOAT - suitable for sandbox for young children. E. Caiazza (Whitey), Ext. 2913.

OUTBOARD - Chrysler 45 hp. Bill, Ext. 2171.

BRIDAL CRINOLINES - sizes 6, 8, 10, 14, full length, bouffant, borrow or buy. 289-1883.

LOCKSMITH COURSE - w/equipment, reasonable for retired person. George, 589-0819.

ENCYCLOPEDIA BRITTANICA - less than 15 yrs. old, complete. Norene, Ext. 7253, 5514 or 821-9347 eves.

TRAVELLER TO PARIS FRANCE - before May 10, bring empty suitcase to student. S. Lacks, Ext. 3369 or 286-1022.

2 BDRM. HOUSE - or apt. located between BNL and Stony Brook, for couple. Louise, Ext. 3405.

73 or 74 DODGE DART - w/V-8 and disc brakes, need k-frame and suspension parts. Ext. 3869 or 744-3577.

BABY STROLLER - umbrella type. Duke, Ext. 2957 or 289-3586.

A/C CASEMENT - 6K-9K BTU. Pete, Ext. 4819 or 289-7218.

WINDOW VAN - 78 or newer, Dodge or Ford, must have auto. trans. Al, Ext. 4645 or 744-0354.

BATHROOM FIXTURES - also medicine cabinet & vanity, 20x17 max.; circuit breaker panel, G.E. or Westinghouse or compatible. Ext. 3316, 698-1362 after 6 p.m.

CLARINET - used, suitable for beginner. Ext. 3316.

Classified Ad Policy

Deadline is 4:30 p.m. Friday for publication Friday of the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Ads for the sale or trade of firearms will not be accepted.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated. One ad per person per week.
7. **Property for sale or rent cannot be accepted on this form. Special Real Estate Ad Forms are available at the office of the Brookhaven Bulletin, Building 134.**

☐ For Sale: Autos & Auto Supplies ☐ For Sale: Boats & Marine Supplies ☐ For Sale: Miscellaneous ☐ Car Pools ☐ Wanted ☐ Free ☐ Lost & Found

Please print your ad below in 15 words or less using one word per block. Include name and phone number to call.

Note: The following must be completed for your ad to appear.

NAME (Please Print) .....

Employee's Signature ..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 134 (Ext. 2345).

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