BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Hydrogen Technology: Evaluation Center Opens at BNL

Last month, the Hydrogen Technology Evaluation Center (HTEC) became operational on Rutherford Drive extension. This facility was built to test and analyze more efficient and less expensive methods of producing, storing, transporting and using hydrogen as an energy source. The center is being used initially to study the production of hydrogen from solar energy via advanced water electrolysis, the first in a series of investigations into advanced hydrogen technology. The center was built as an extension of the work done at BNL on the storage of hydrogen using metal hydrides.

"The center will be used to facilitate the exchange of information about advances in hydrogen technology," explains Alessio Mezzina, field manager of BNL's Chemical/Hydrogen Energy Storage Systems Program, which supports the HTEC. "As well, it will be used for the training of engineering students and the transfer of hydrogen technology to the commercial sector." Mezzina's program is funded by the Division of Energy Storage Technology of the DOE Office of Energy Systems Research, which participates with the International Energy Agency in investigating hydrogen technology.

A five kilowatt (kW) flat plate photovoltaic array in combination with utility electricity provides the power to a 15 kW General Electric solid polymer electrolyte water electrolyzer. The electrolyzer dissociates water into hydrogen gas which is 99.995% pure, and oxygen. HTEC project manager Philip Metz is coordinating the testing, computer simulation and economic analysis of the photovoltaic-electrolyzer system, among the largest and most advanced ever tested in the world. The system is operated by Michael Piraino. The computer simulation and economic models were developed by Richard Leigh.

Metz's goal is to determine the optimal design of the photovoltaic-electrolyzer system with and without the use of utility electricity. The future design of photovoltaic-electrolyzer systems will be based on the experimental and simulation results obtained from the HTEC.

Layout

The first room of the 50 foot by 20 foot prefabricated center houses the data acquisition and control computer system. The computer runs the system using real or simulated weather conditions such as external temperature or sunlight. Using simulated weather conditions allows the center to operate at night or during cloudy day conditions, to repeat interesting operational conditions, or to use ambient conditions from other locations.

Room 2 is a small utility room containing a power conditioner, a piece of equipment that changes the alternating current from the electric company to the direct current needed by the electrolyzer, and matches the voltage required by the electrolyzer when both the photovoltaic array and the utility electricity are being used.

The third room contains the electrolyzer, water treatment and hydrogen handling equipment, and gas monitoring and safety devices. Currently, the hydrogen gas is vented to the outside; in the future, the hydrogen gas will be compressed using a heat-actuated metal hydride compressor, and stored. Metz will be willing to provide the hydrogen to on-site users of that gas.

Room 4 is a laboratory for the analysis of the hydrogen gas stream and electrolyte content. Each room has a wall of windows between it and the corridor so visitors can tour the facility without interfering with experimental operation.

Operation

The photovoltaic-electrolyzer system operates five ways. In constant power mode, utility electricity provides the electrolyzer with constant input from 0 to 15 kW.

In one transient power mode, the photovoltaic array is the sole source of electricity for the electrolyzer. However, the 5 kW array provides insufficient power to fully utilize the 15 kW electrolyzer.

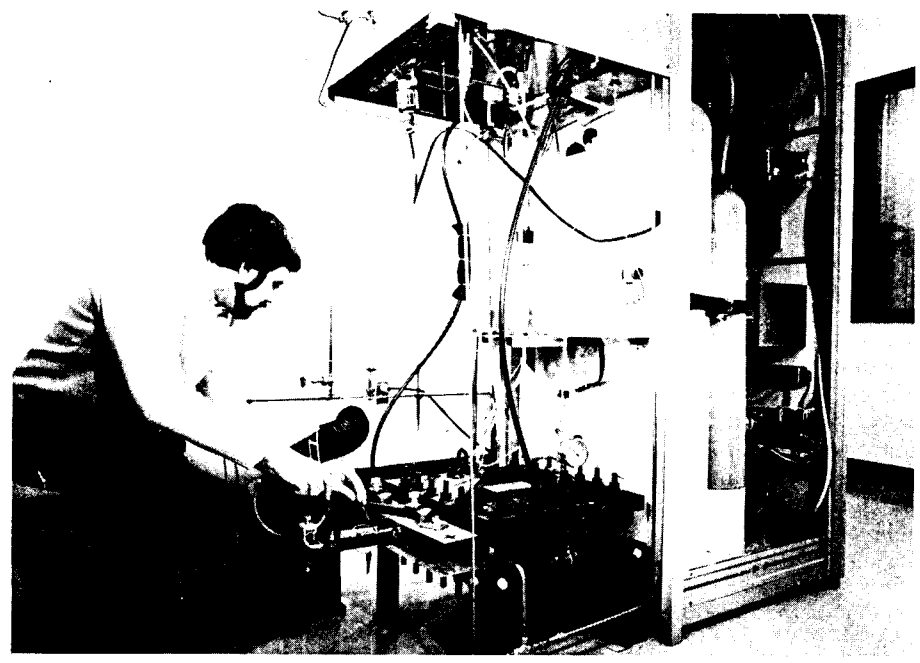
For this reason, the power conditioner draws power from the photovoltaic array and the electric company in another transient power mode. The electrolyzer is supplied with power directly proportional to the photovoltaic array output. "This mode permits realistic electrolyzer operation, and identification of array operating problems without the expense of a full-size array," explains Metz.

In constant hydrogen production mode, the power conditioner draws as much electricity as the photovoltaic array can provide, and makes up the difference by using utility electricity to ensure a constant rate of hydrogen production.

In program operating mode, the computer directs the operation of the photovoltaic-electrolyzer system; a computer operator, written program, or simulation model driver may provide instructions to the computer. "The program operating mode provides the experimental system with a lot of flexibility," says Metz. "For example, the behavior of the electrolyzer can be studied under simulations of extreme weather or transient power conditions. These and other conditions can be repeated at will to investigate how modifying the system will affect performance."

After baseline tests using constant power to characterize electrolyzer behavior, Metz has planned system testing and analysis through September 1985 to optimize the photovoltaic-electrolyzer system. Testing the system will measure component performance and system behavior, and verify analytical component modeling and computer simulation. "The analysis will mainly involve component

(Continued on page 2)



Phil Metz and the electrolyzer.

Standing between the photovoltaic arrays are Philip Metz (left) and engineers from the Kennedy Space Center who toured the Hydrogen Technology Evaluation Center on March 21. Since the space shuttle uses hydrogen for fuel, and since purchasing hydrogen is expensive, NASA is considering various on-site hydrogen production options. Work at the HTEC may provide a basis for evaluating these electrolytic hydrogen-production systems.

—photos by Rosen

Phi Beta Kappa Honors G. Goldhaber

Gertrude Scharff Goldhaber, BNL physics consultant, has been selected by the Phi Beta Kappa society as one of thirteen Visiting Scholars for 1984-85. As a Visiting Scholar, Goldhaber will travel to some of the 100 universities and colleges having Phi Beta Kappa chapters, and spend two days on campus meeting students and faculty, partaking in classroom discussions, and giving one formal public lecture.

Goldhaber, who earned her Ph.D. in 1935 from the University of Munich in her native Germany, discovered that spontaneous fission is associated with the emission of neutrons in 1942 at the University of Illinois; that discovery was classified top secret, and not published in the open literature until 1946. She, together with her husband former Laboratory Director Maurice Goldhaber, established the identity of beta particles with atomic electrons in 1948. Goldhaber joined the BNL staff in 1950, and was named a Senior Physicist in 1962. At BNL, she has been working on the problems of nuclear structure, and parity violation; at present, she works as an adjunct professor at Johns Hopkins University, using the facilities of the Lab.

Mort Rosen

Gertrude Scharff Goldhaber

Goldhaber was elected a fellow of the American Physical Society in 1947, to the National Academy of Sciences in 1972, and a fellow of the American Association for the Advancement of Science in 1980. As a Councillor-at-Large of the American Physical Society from 1978 to 1982, Goldhaber promoted pre-college physics education. In 1982, she introduced youngsters to physics as a career option as an educational advisor of the New York Academy of Sciences.

The Phi Beta Kappa Visiting Scholar program was begun in 1956 to enable undergraduates to meet and talk with distinguished scholars in diverse disciplines. During her campus visits, Goldhaber will discuss band structure and nuclear dynamics. As well, she will address the problems in attracting women to careers in physics and other sciences. "There is no doubt that access for women to all fields of science has opened up enormously since the 19th and early 20th centuries," says Goldhaber. "How-

(Continued on page 2)

Peter Horton

Gathered at Brookhaven March 22-23 to discuss computer modeling of acid rain were (from left) Marvin Olson and Eva Voldner, both from the Atmospheric Environment Service in Canada; Edward Balzer, Carmen Benkovitz and Ronnie Evans, all in BNL's Atmospheric Sciences Division, DAS; and Terry Clark, with the U.S. Environmental Protection Agency. They are members of a core team working on an EPA-funded project called International Sulfur Deposition Model Evaluation, which will be comparing 12 different pollution transport models from the U.S., Canada, Norway, Finland, Denmark and Great Britain. Says BNL's Carmen Benkovitz, "The question of how pollution is transported from source to deposition is still up in the air. The models are being evaluated to assess the differences resulting from different ways of mathematically modeling the real world." The project is currently in its first phase, during which input data on meteorology and pollution sources are being processed at BNL. The input data then will be sent to all project participants, who will run it through their own models to get predictions of sulfur deposition. Results will be sent back to BNL for analysis. "We will do a rigorous comparison of the models," says Benkovitz. "We will also compare model predictions with what actually happened for 1980, the year being modeled." In the study of acid rain, modeling is a vital tool because it could be used to perform assessment of patterns of deposition, given a scenario of emissions, control and/or change. Even more basic, modeling could be useful in better understanding the physics and chemistry associated with pollution transport and deposition.

Inside Info

Edith Thornhill, Sr. Executive Secretary in the Office of Scientific Personnel, has been given the Volunteer of the Year Award by the Terryville Fire Department. The award was presented at Mather Memorial Hospital on March 25, during ceremonies at which the 20 ambulance corps that feed into Mather, honored their volunteers. Edie Thornhill is an Emergency Medical Technician and a member of the Terryville Ambulance Corps and, when she is home, responds to all ambulance calls in her area. This, she says, could mean anything from "a cut finger to a cardiac arrest." Community service seems to run in the family. Her husband, Frank Thornhill (High Energy Facilities), a member of both the Terryville Fire Department and the Ambulance Corps, won the same award in 1982.

Pianist Agustin Anievas will play Bach's Partita No. 1 in B Flat, Beethoven's Appassionata Sonata and Brahms' Variations on a Theme by Paganini for his concert at Berkner Hall, Tuesday, April 3, at 8:30 p.m. Tickets will be sold at the door. General admission is $7; students and senior citizens, $4; and those under 18, $3.

Exploring at BNL

The Suffolk County Council of the Boy Scouts of America would like to establish a Science Explorers Post at the Lab. On Wednesday, April 4, at 10 a.m. in room 300 of Chemistry, the director of Exploring for Suffolk County, Thomas Spruck, Jr., will introduce department heads, and all interested scientists, technicians, and professionals to exploring, and explain how they can introduce explorer scouts to careers in science. According to Donald Metz, DAS, about 30 advisors are needed to each volunteer one night once or twice a year to lead explorer scouts in science related activities.

Exploring is a coeducational program to introduce young adults aged 15 to 20 to activities related to their career or hobby interests through contact with adults in those fields. In the local Exploring Division's 1983 survey of career interests, explorer scouts indicated interest in computing, architecture, engineering, life sciences, oceanography, chemistry, physics, and meteorology. When a science exploring post is established at BNL, it would meet twice a month, have a different advisor lead each meeting, and cover a new scientific topic each time.

Until last November, Terry Whitledge, DAS, ran an Oceanography Post for Explorer Scouts for three years at the Lab. "I tried to make the meetings fun with some golly gee-wiz science," explains Whitledge. His 15 oceanography explorers met for two and a half hours twice a month, learned about oceanography from guest speakers and through handouts, collected samples and examined them under the microscope, and went on field trips to such places as Woods Hole Oceanographic Institute. Though he could not continue leading the Oceanographic Post alone, Whitledge said he would consider participating in a general science post.

Scientists, technicians, and professionals who would like to encourage explorer scouts to consider vocations in science are invited to attend the April 4 meeting. For further information, contact Donald Metz at Ext. 3054 or 4519.

Goldhaber (Cont'd)

ever, girls from a very early age frequently lack the conviction that they are capable of becoming scientists." She blames girls' lack of confidence in their mathematical and scientific ability to the lack of role models and mentors to encourage the girls to go into these fields. "The vicious cycle which was originally created by the overt exclusion of women from mathematics and science must be broken."

In one of her addresses, Goldhaber presents brief biographies of Mary Somerville, Sophia Kovalevsky, Emmy Noether, Marie and Irene Curie, Lise Meitner, Gerty Cori, Maria Mayer, Dorothy Hodgkin, Rosalyn Yalow, and Barbara McClintock. According to Goldhaber, they are a "few highly talented, self-motivated, and intrepid women who managed to overcome formidable barriers" to make significant contributions to science.

"The personalities and circumstances of the last two Nobel Prize winners form an interesting contrast," explains Goldhaber. "Rosalyn Yalow was raised by parents who did not have a high school education and owned no books, but who were determined to send their children to college. An older brother introduced her very early to the joys of reading with the help of a nearby public library. Nothing could prevent her from going on to build a career in science from then on.

"In contrast, Barbara McClintock, a doctor's daughter, was encouraged by her parents to observe nature rather than to bury herself in books. Her mother tried to dissuade her from going to college because she thought it not ladylike. However, with her father's agreement, McClintock went to Cornell.

"What can we learn from our review of the life and work of these outstanding women scientists?," asks Goldhaber. "That it is of the utmost importance to give a girl at a very early age the conviction that girls are capable of becoming scientists. Furthermore, it is of great help to find a mentor who will instill knowledge, and encourage independent work." According to Goldhaber, once a woman is pursuing a science career, she should have the support of her institution regarding maternity leave, child care, and progress toward tenure. "If the older generation of women had had these advantages, the prejudices and awkwardness which isolate and exclude women scientists from exciting, new developments could have been avoided." — Marsha Belford

Hydrogen (Cont'd)

modeling, and computer simulation of the photovoltaic-electrolyzer system, says Metz, "and will answer questions about long-term system operation, and control strategy which would take years to answer experimentally.

"Since the experimental system can operate using simulated external conditions from other locations, visiting researchers can experimentally test the system's operation for their locations," says Metz. "As a user facility, the Hydrogen Technology Evaluation Center will provide opportunities for increased national and international cooperation in this field."

The BARE Facts: News about clubs sponsored by the Brookhaven Association for Recreation of Employees.

Anaerobic Dance Club: is offering a series of classes on holding your breath while dancing. Learn how to turn the shade of blue that will match the ballroom walls or the disco lights. Instruction on how to pass out gracefully in your dance partner's arms.

Astrology Club: urges all to forget the search for the Grand Unification Theory and Supergravity, and accept the four basic elements we all know and love: fire, earth, air, and water. Next meeting at the Cosmotron to draft the horoscope for the week of April 1st.

Computer Dating Club: invites all singles to mingle electronically. Get personal through your pc; networking and teleconferencing available through Applied Math. NOTE: will those looking for love via the electronic billboard please not lie about their age, height and weight. Remember, you can't hide behind your terminal forever.

Tie Flyers Club: will be flying ascots, bow ties, four-in-hands, and Windsor knots by night.

Lack of Exercise Club: will meet over morning coffee (non-dairy creamer and four sugars), after lunch, and over afternoon coffee (half cream and artificial sweetner) to discuss "Lying down before, after, and on the job." Dessert will be served.

Motorcycle Club: will meet to vote on proposal to become a chapter of Hell's Angels.

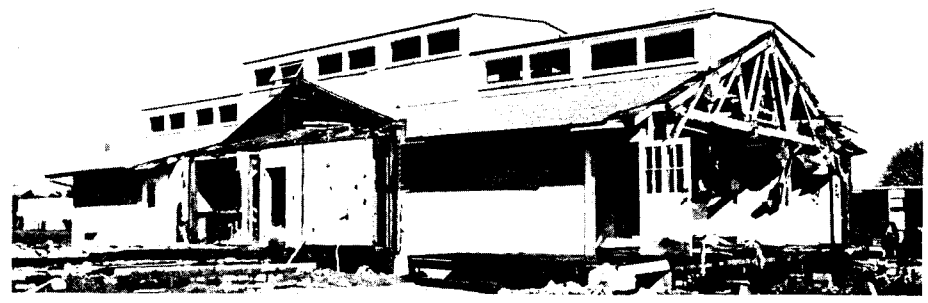
Nutrition Study Group: will sponsor a midmorning talk on "Coffee Break Blues: Sugar-Insulin Reaction" after chocolate tasting session. Coffee (milk and two sugars) will be served.

Racket Club: is showing the movie "The Abscam Tapes." Planning field trips to "Let's Make a Deal" and the DeLorean cocaine conspiracy trial.

Shoot-out Club: BNL will revert to Camp Upton when the National Survival Game will be played on site during weekends. Come to a fun and war games strategy session. First combat: Camp Upton Irregulars versus the New York National Guard.

Corral Group: will gather at the round-up. Calf roping, barrel racing, steer wrestling, and bronco riding will be practiced while singing the latest cowboy, and country & western hits.

Runners-Up Club: tee shirt for sale. "It doesn't matter if you lose" on front, "It only matters if you win" on back. REMINDER: we are not losers, we are also-rans.



The Upton House is the latest model home located at BNL. It utilizes a number of different architectural, engineering and construction concepts in its design, resulting in heating costs not encountered in a typical home. The heating costs are due to passive air infiltration into the house through the north, south, east and west facing windows, and the holes in the walls. However, the problem of indoor air pollution found in air-tight houses has been eliminated. A great summer rental.

April Fool from Marsha Belford

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Clinic Offers Wellness Program

Many organizations have begun to sponsor wellness programs in the workplace which emphasize disease prevention, health education, and medical cost containment. The Laboratory plans to begin an Employee Wellness Program, consisting of regular meetings with short presentations or movies followed by discussion, distribution of printed matter, referral to community resources, or other activities appropriate to the topic under discussion. It is hoped that the information in these programs will supplement that available to employees during examinations and consultations at the Occupational Medicine Clinic.

In most cases, Dr. Laura Sbarra or Dr. Judith Katsin will present the topic, with assistance as needed from others at the Laboratory or off-site groups, such as the American Cancer Society or the Lung Association.

Examples of topics which may be covered include nutrition, smoking and health, vehicular safety, preventive medicine (various topics), physical fitness, lifestyle changes, stress reduction, hypertension, accident prevention, and many others.

The first seminar, "Preventive Health Care: Are Yearly Physical Examinations Effective?" will be presented by Dr. Sbarra on April 11 at noon in Berkner Hall.

The seminar program is open to all employees, provided supervisory approval is obtained beforehand.

A notice will appear in the Bulletin preceding seminars. Employees who would like to suggest a particular topic should contact Dr. Sbarra, Ext. 5665, or Dr. Katsin, Ext. 4567.

Hispanic-American Society

The Society will have blocks of tickets available for Miriam Colón's Puerto Rican Traveling Theatre at Theatre Three, Port Jefferson. Two performances will be given on April 14 of "The Oxcart" by Rene Marques; in Spanish at 2 p.m. and in English at 8 p.m. Tickets for the matinee are $5.50 and for the evening performance $10 and $8. They may be purchased from Jose Medina, Ext. 7636, or Lucy Sanchez, Ext. 4399.

Medical Services

Effective today, medical care will no longer be available after regular working hours. Previously, limited employee health services were available at night, on weekends and during holidays. Now, requests for medical assistance from employees and on-site residents after working hours will be handled only by the Fire/Rescue Group. In case of a medical emergency, call Ext. 2222. For non-emergency health care, consult your personal physician or the nearest hospital. For assistance which is not covered in the above, telephone the BNL police at Ext. 2238.

Service Awards

The following employees received service awards during the month of March:

Thirty Years

James B. Cumming ..... Chemistry
Thomas Holmquist..... Reactor
Harvey J. Thomas .... Nuclear Energy

Twenty-Five Years

Carl L. Goodzeit ..... Accelerator
Richard R. Lorenz ..... Physics
Nicholas P. Samios ... Directors Office
Burton A. Woods ... Plant Engineering
Robert W. Young.....S&EP

Twenty Years

Edgar A. Cote ..... Applied Science
Hardie A. Fuller .....Central Shops
Pierre Stillman ..... Accelerator
Ignatius N. Tang..... Applied Science
Nelson E. Tyler .....Supply & Materiel
John C. Walker ..... Accelerator
Wen-Shi Yu ..... Nuclear Energy

Ten Years

Theodore J. Dahne ..... Plant Eng.
Marshall G. Elzinga ..... Biology
Ruby W. Fajer..... Applied Science
Stanley V. Lekach .... Nuclear Energy
Laurence S. Littenberg ..... Physics
Yasuko Sanborn ..... Nuclear Energy
Peter R. Stolz ..... Plant Engineering

Volleyball

Standings as of 3/26/84

Mixed League

A Division	
Dinkers	8-1
Teddybares	7-2
Up Fagrabs	5-4
EPO's	4-5
Mixed Ups	4-5
Semi Tough	4-5
Nuts and Bolts	3-6
TNT	1-8
B Division	
Phoubars	8-1
Servers	8-1
Bottoms Up	5-4
Excitons	4-5
Screwballs	4-5
Chungas Revenge	3-6
CRAW	3-6
Quirks	1-8

Starting April 1, tickets for the end-of-season party at Rock Hill Country Club on May 11 will be available to team captains from either Barry Karlin, Bldg. 725A, Ext. 5431, or Walt Reams, Bldg. 526, Ext. 3408. Ticket prices are $4 for team members and $8 for guests. There will be a buffet, a cash bar, and a D.J. to supply the music. Interested team members should see their team captains for tickets.

Cafeteria Menu

Week Ending April 6

Monday, April 2		
Beef barley soup	(cup)	.65
	(bowl)	.85
Savory baked chicken quarter & 1 veg.		1.90
Eggplant Parmesan w/1 veg. & garlic bread		1.95
Hot Deli: Pastrami	(bread)	1.85
	(roll)	2.00
Tuesday, April 3		
Cream of chunky vegetable	(cup)	.65
	(bowl)	.85
Beef & broccoli stir fry on rice		2.00
Turkey pot pie & 1 veg.		1.90
Hot Deli: Top round of beef	(bread)	1.95
	(roll)	2.10
Wednesday, April 4		
Split pea soup	(cup)	.65
	(bowl)	.85
Baked meatloaf & 1 veg.		1.90
Shrimp Oriental on rice		1.90
Hot Deli: Ham & cheddar melt	(bread)	1.85
	(roll)	2.00
Special		
Bowl of freshly steamed mussels		.75
Thursday, April 5		
Turkey noodle soup	(cup)	.65
	(bowl)	.85
Old fashioned beef stew on egg noodles		2.00
Sautéd chicken livers w/wine sauce & 1 veg.		1.85
Hot Deli: Italian style sausage hero		2.00
Friday, April 6		
Boston clam chowder	(cup)	.65
	(bowl)	.85
Roast fresh ham & 1 veg.		1.95
Broiled fish fillet & 1 veg.		1.85
Hot Deli: Bratwurst & kraut	(bread)	1.85
	(roll)	2.00

Hospitality News

A discussion and demonstration of the many ways to dye eggs and create designs on them for Easter, will be the theme of the next Hospitality Committee's monthly get-together on Tuesday, April 3, from 9:30 to 11:30 a.m. at the Brookhaven Center. Krystina Zakowicz will demonstrate "Polish Egg Dyeing."

Wives of Laboratory employees, guests, and visitors are welcome. Please come and bring the children. Babysitting is provided free of charge. Coffee, tea and danish will be served.

Bowling

Pink League

B. Jellett 181/202/549 scratch series, D. Johnson 186/189/533 series, M. Apelskog 191, K. Kissel 188.

Red/Green League

R. Larsen 245, W. Kristiansen 242, J. Medaris 213/234/631 series, G. Meinken 210/200, J. Petro 204, A. Lorentsen 202, A. Pinelli 202, E. Meier 201, K. Riker 201, J. Connelly 200.

Purple League

3/15: G. Hassell 223/223/617 series, J. Ferrante 230, J. Petro 221, B. Belligan 203, M. Connelly 194, E. Schwaner 192, S. Smith 201.

3/22: E. Schwaner 206, D. Adams 205, D. Miesell 195, D. Stonebridge 192.

White League

J. Griffin 224, P. Callegari 211, J. Sheehan 206, A. Pinelli 201, M-G Meier 196, P. Manzella 188.

L.I. Industrial Tournament

J. Morris 242/232/634 series, R. Larsen 211.

Arrivals & Departures

Arrivals

Harold J. Heffert ..... Plant Eng.
Johannes C.P. Matthijs..... Biology
E. Seyma Ogut ..... Biology
Arthur N. Otis, Jr...... Accelerator
Stephen M. Perlstein ..... Accelerator
Thomas Russo ..... Accelerator
Christopher Watts ..... Accelerator

Departures

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

William E. Johnston ..... Plant Eng.
Catherine J. Vanderoef .....S&EP

Cricket

As in previous seasons, the Brookhaven International Cricket Club hopes to arrange a few matches with outside teams during the coming season, if there is enough interest. Anyone who wishes to play should call John Millener at Ext. 3853, or Dave Cox at Ext. 3818.

John Connelly

Ed Taylor

BERA Board Election Winners

John Connelly and Ed Taylor were voted winners of the 1984 BERA Board election held last week.

On May 1, they will replace outgoing Board members Janet Sillas and Nelson Tyler, and will be joining incumbents Mickey Haller, Sandi Lane, Jim Roesler and Ken Sutter.

The Board would like to thank all those who contributed to the success of the election: the nominating committee for selecting an admirable slate of candidates; the candidates themselves for accepting the nominations; and the voters for taking time to cast their ballots.

Members of the Board are elected by employees to act as their BERA representatives, and suggestions or complaints relating to BERA activities should be discussed with them.

Basketball

Boxscores — 3/22/84

Game 1

Runaway — 77		Hollywood — 64	
S. Woodsen	2	E. Meier	14
G. Shepherd	16	L. Walcott	22
D. Hedin	2	D. Nordstrom	13
G. Smith	2	L. Lawrence	8
S. Gilbert	15	R. Schuman	2
T. James	20	B. Woodson	3
P. Johnson	20	R. Kowalski	2

Game 2

Longshots — 60		Coasters — 58	
J. Gaffney	18	M. Fulkerson	12
L. James	14	L. Snead	4
B. Johnson	4	B. Orr	27
J. Garrison	4	K. Wyman	3
D. Hall	4	B. Jasper	12
D. Harris	8		
R. Seymore	8		

Team Standings

Hollywood	7-2
Longshots	6-3
Runaways	4-5
Coasters	1-8

Fall Enrollment for Nursery School

The Upton Nursery School is now registering three and four-year old children of BNL employees for the 1984-85 school year. As a convenience to interested parents, some officers of the school will be on hand with information and registration forms in the Berkner Hall lobby, Tuesday, April 10, from noon to 1 p.m.

Mrs. Bloch, teacher for the three-year-old class, helps Emily Weinert, Pam Aiello and Tara Castillo mix chocolate pudding for a snack.

The school is a non-profit corporation and is run as a cooperative. Parents help as teachers' assistants on a rotating basis and manage the school's business. Professional teachers lead each class and help the children discover and explore their environment, capabilities and identity. The aim is to foster the development of the children as they learn to respect themselves and their surroundings, as well as the languages and customs of foreign classmates. No formal academic subjects are taught.

Tuition will be $35 per month for two mornings per week, and $46 per month for three mornings per week. Parents are encouraged to visit the school during classes, which are held at the Recreation Building in the apartment area. To schedule a visit contact Karen Mouzakes, 924-3974 (after 4 p.m.), or Sandy Andrews, 924-0425.

Classified Advertisements

Autos & Auto Supplies

74 DATSUN 280Z - 2+2 excel., $4,000. Peter, 212-746-8156 after 6 p.m.

78 HONDA - 750 K, fairing, radio, 11,000 mi., excel., $1,500 firm. Ed, 929-6798 after 6 p.m.

80 FIAT BRAVA - 32,000 mi., orig. owner, a/c, am/fm stereo cassette, excel. cond. 673-4738 after 4:30 p.m.

75 HONDA - 500 T, very good cond., fairing, ready to go, $375. Frank, Ext. 2022 or 399-4480.

68 VW - engine & trans. excel., needs front end, good for parts, $300. 331-5567.

72 DODGE SWINGER - 318 V8, p/s, auto., clean in & out, needs engine work. Rich, 924-8224 eves.

71 CHRYSLER NEWPORT - runs fine, many new parts, $350. Rich, Ext. 4363 or 924-7238.

73 HONDA - XL250, 6,000 mi., good cond., 4 cycle, for street or trail use, $450. Ext. 3458 or 369-2504.

73 VW SQUAREBACK - good transportation, low mi., $600. 286-9256.

HONDA - 500cc twin motorcycle, good cond., best offer over $550. Irene, 589-5126.

80 PONTIAC GRAND PRIX - 39K mi., V6, auto., am/fm, a/c, p/s, p/b, console, red w/white top, $5,200. 588-7687.

76 KAWASAKI - KZ400, windshield, bags, trunk, $650. 821-0758 6-8 p.m.

DODGE RIM - 15", $5. Al, Ext. 7588.

FORD TIRE & RIM - C78-14, WW, for Ford, good cond., $25. G. Langhorn, Ext. 4986.

VOLVO RIMS - 15", (2), $30. Bill, 929-6442 after 6 p.m.

74 AUDI FOX - good transportation, runs well. Greg, 286-8814 after 6 p.m.

71 FORD LTD - 8 cyl., p/b, p/s, runs well, body good, $350. 265-0117.

MANLEY PISTONS - 043 rings w/l.w. pins, 327+.030, $150; alum. super rods, $100. Bill S., Ext. 4434.

76 SUZUKI - GT550, ram air system w/back rack & windshield, $550. 289-1705.

79 HONDA - 750F Super Sport, 3,000 mi., profess. maintained, polyglycoat, garaged, $1,650. 759-2460 or 473-7809 eves.

79 MERCURY CAPRI - p/b, p/s, a/c, auto., hatchback, am/fm stereo, $3,095. 821-9280.

79 RABBIT - 2 dr., 87K mi., rebuilt engine, many new access., asking $3,500. George, Ext. 3636 or 759-1328 after 6 p.m.

71 VW BUG - 4 spd., new tires, many other new parts, good cond. Bill, Ext. 2422.

GM FACTORY MAGS - (4), 14x16 chrome, $60; Edelbrock C454 manifold w/rectangular parts, fits B.B. Chevy, $80. Ext. 3869 or 744-3577.

72 CONCORD TRAILER - 24 ft., sleeps 5, bathroom, kitchen, 30 gal. water tank, gas & elec., windup jack, good cond., $2,500. 475-4831.

77 LINCOLN - mint cond., low mi. 732-1979.

69 VW BUG - excel. motor, $350. Augie, 289-4211 eves.

75 VOLVO - 4 cyl., good cond., $1,500. Ext. 4970.

78 PUCH MOPED - class B, excel. cond., asking $400. 363-6845.

73 MOBILE HOME - 12x65, like new cond., in Florida, must be moved, $9,500. 281-8031.

79 DODGE STATION WAGON - 66K, clean, a/c, p/b, auto., 6 cyl., slant roof, rack, rear defroster. Ext. 4452 or 543-0079.

83 HONDA ACCORD-LX - hatchback, 5 spd., a/c, p/s, p/b, am/fm stereo, 16,000 miles, like new, $8,900. Yannis, Ext. 2435 or 732-6546 eves & weekends.

71 CHEVY MONTE CARLO - 78 305 engine, p/s, p/b, am/fm stereo cassette, full gauges, $1,500. Ext. 4087.

80 DODGE RAMCHARGER - 4-wheel drive, 318-V8, 27,000 miles, a/c, am/fm stereo, mag wheels. 399-0152 after 5 p.m.

MOTORCYCLE ACCESSORIES & PARTS - discount prices, 400 x 18 Metezler ME99 street tires. 325-9580 after 6 p.m.

73 OLDS CUTLASS - auto., a/c, p/s, p/b, am/fm, some rust, runs well, good cond. Ext. 4464 or 286-8374.

80 TOYOTA 4X4 LONGBED - extras, excel., $7,200. 878-8255 eves.

76 BUICK REGAL - full power, a/c, c/c, am/fm stereo, excel. cond., asking $2,500. Ext. 3843 or 727-2471 after 5 p.m.

73 DODGE DART SWINGER - excel. running cond., $450. 758-6291.

75 DODGE DART SPORT - 340 c.i., 4 spd., Cragers, Dunlop radials, new clutch, stereo, asking $1,700. 732-7288.

TIRES - (4) 7:50 x 16, 8 plys, on 8 hole wheels, $60. Ken, 289-8212.

74 CHEVY NOVA - over 100,000 mi., rebuilt starter, new muffler system, 2 tires, body poor cond., new battery. Saitta, Ext. 2907.

81 CHEV. CHEVETTE - 2 dr., 4 spd., 35,000 mi., am radio, mint $2,700. 281-0374.

71 CHRYSLER NEWPORT - runs fine, many new parts, $350. Ext. 4363 or 924-7238.

78 CHEVY CAPRICE CLASSIC - excel. cond., small 305 V8 engine, p/b, p/s, a/c auto., $2,275. 821-9280.

78 OLDS OMEGA - 2 dr., 62,000 mi., bucket seats, 4 spd., V8, am/fm stereo, $2,500. Jim, Ext. 5025 or 821-1704 eves.

74 CHRYSLER NEWPORT - 4 dr., $500 or best offer. 727-5912.

74 MUSTANG - 4 spd., 6 cyl., am/fm, $900. 744-6668 after 6 p.m.

68 ROVER - restored, many new parts, body very good, classic car, must see. Mario, Ext. 7148 or 363-2522.

70 CHEVY IMPALA - 4 dr., h.t., 305 a.t., for parts, runs well, body fair, front suspension damaged. David, 757-5478.

74 TOYOTA LONGBED PICK UP - 89,000 mi., runs well, rusted, minor collision damage, $500. Ext. 3458 or 369-2504.

TOMOS MOPED - 5,000 mi., 2 baskets, $200. Tony, Ext. 3637.

TRUCK TIRES - (3) Dick Cepek, 14/35-165, off-roaders, excel. cond., $150. Dick, Ext. 3499 or 589-9103.

80 KAWASAKI 650 LTD - red, crash bars, excel. cond., must sell $1,400. Bob Johnson 475-2305 or 283-4741 after 6 p.m.

65 BUICK SKYLARK - good for local trans. or parts $75. 369-2838 after 6 p.m.

68 PONTIAC TEMP. - 2 dr., a/t, p/s, p/b, a/c, excel. int., great eng., good body, 50,000 mi., $1,450. Marge, Ext. 3888 or 727-7075 eves.

74 GREMLIN - auto., a/c, basic transp., am/fm cassette, asking $600. John, Ext. 5515 or 689-8510.

74 CHRYSLER NEWPORT - leather interior, runs well, $250. J. Guthy, 929-8287.

78 TOYOTA COROLLA LIFTBACK - a/t, am/fm cassette, high mi., dealer maintained, must sell. Pat, Ext. 4628 or 286-8470 eves.

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

76 DATSUN B210 - 4 spd., new alt., reg., exhaust, brakes, water pump, battery, $650 firm. Ext. 5110.

VW PARTS - transaxles, swing, C.V. joint & semi auto., front axles, ball joints & king link pin, make offer. Ext. 7518.

TIRES - (4) P185 R75/14, steel belted radials on Peugeot rims, like new, $150. Fran, Ext. 3536.

76 DODGE ASPEN - 6 cyl., auto., p/s, radials, low mi., excel. cond. Bill, 744-8999.

80 SUZUKI MOTORCYCLE - GS450L, excel. cond., $650. 289-8253.

56 MERCURY MONTERAY - 312 c.u. engine, restored, all orig., p/s, p/b, $3,250. 589-6151.

Boats & Marine Supplies

74 CATALINA - 27', diesel, wheel dodger, many extras, excel. cond., $19,000. 785-7195 eves & weekends.

CATALINA-25 - 15', 4 sails, poptop, Honda 9.9 HP, VHF plus many extras, $14,500. 473-2473 or 744-7127.

PENN YAN - 16', 40 HP elec. Mercury, certified trailer, extras, $2,400 or best offer. Kevin, Ext. 3267.

80 CRESTLINER - 17-1/2', every option, V6 Mercury, galvanized trailer, PTT, mint, never moored. Brian, 757-1581.

75 O'DAY MARINER - sails, 4 bunks, head, sink, screens, whisker pole, clean, $4,800. 286-8229.

DYER DINGHY - 9', fiberglass, complete sailing gear, floorboards, bilge runners, raised transom, $950; 14' Whitehall type rowing boat, fiberglass-teak, spoon oars, $850. Paul, Ext. 2177.

68 CORRECT CRAFT - 24', fiberglass, inboard runabout, head, 250 HP Chrysler, excel. cond. $7,500. 325-1855.

JOHNSON - 80 HP with controls, good cond., $250. 581-1993.

Miscellaneous

YOGURT MAKER - mini-bake oven; Clairol nailworks; Dazy-Donut factory, new, in orig. boxes, asking $10/ea. Ext. 8105 or 929-4701.

MAHOGANY LIBRARY TABLE - antique, carved legs, $150; antique aqua water bottle, $35; pewter & tin coffee warmer & server, $25; antique pontiled bowl, $15. Irene, 589-5126.

REFRIGERATOR - for boat or camper, Norcold, under counter, 12 VOC or 110 AC, very good cond., asking $200. J. Bush, Ext. 4638.

ELECTRIC PIANO - Yamaha CP-20, touch sensitive, $400; acoustic 140 bass amp w/106 bottom, (2) 15's, $250. 331-5567.

RACING HANDLEBAR - chrome, ram style, for 10 spd., new cond., $1, Spalding catcher's face mask, new cond., $5; shoe rack stand, chrome, holds 9 pr. of shoes, new cond., $3. 727-3608 after 5 p.m.

IBM-PC - 64K, 2 drives, display, 3 mos. old, best offer over $2,750. Jim, Ext. 3301.

MATTRESS - full size, extra firm, like new, $40. 654-8438.

TRICYCLE - $15; portable TV stand, $15; toys, odds & ends. Debbie, 399-1790.

RIDING MOWER - 1981 Yazo, 42" cut, 16 hrs., commerial, good cond., $1,800. 734-5207.

DOCK SPACE - Center Moriches, private, long season, price neg. 878-8177 after 5:30.

SPRINKLER - self propelling, $20; contemporary glass/slash chrome chandelier, $40. Ext. 3701.

HEADBOARDS - king size, dark pine, Cannonball, excel., cost $300, asking $100; 3/4 Paul McCobb, blonde finish, asking $20. 929-4701 or 929-8105.

BIKES - (2) Huffy, 3 spd., 26", coaster hand brakes, excel. cond., $90/ea. Ext. 3354 or 475-7250.

PIONEER STEREO - SX-636, receiver, amplifier, 25 watts, $80. Ext. 2041.

WEIGHT BENCH - w/100 lbs. of plastic plates, good for beginners, $20. Tom, 878-2233 after 6 p.m.

LAWN MOWERS - Simplicity, 30", ride-on, reel-type, gas, $100; Sears 21" reel type, gas, $85. 286-9256.

COLECOVISION - w/Donkey Kong, needs one joystick, $75 firm; cartridges, Smurf, Donkey Kong Jr., Cosmic Avenger, excel. cond., $20/ea. Nick, Ext. 4406 or 585-2707 after p.m.

PITBULL PUPS - 8 wks. old, w/papers, $350. John, 878-0794.

BEAR LTD BOW - 45-65 lbs., 30' draw w/bow quiver, sights & case, $100. Bill S., Ext. 4434 or 399-6168.

SPINNING WHEELS - decorative indoor planters, 3/$35; vanity bench, $5. Nancy, Ext. 5274 or 281-2767 eves.

CEILING TILES - used, industrial, white, insulating 24x48, 5/8 thick, 65 tiles, $25. Ext. 2981 or 473-7809.

DINETTE SET - 36/54/72 w/leaf, oval, 4 swivel chairs, good cond., $75. Ext. 4219.

BED - queen size, Colonial style w/Sealy Posturepedic mattress & boxspring, $225. 289-3283 after 3:30 p.m.

COLONIAL BEDROOM SET - Cannonball bed, triple dresser, mirrored deck, 2 night stands, $800. 283-0475 after 5 p.m.

BABY ITEMS - dressing table, $5; playpen, $15; swing, $5; strollers, $ & $10. Ext. 5371 or 472-4087 after 6 p.m.

CHAIRS - (2) gold colored, barrel back; four seat floral pattern sofa, excel. cond. 363-2070 eves.

PIANO - Shauniger upright spinet, $700; Chappee coal stove, $100. 589-6151.

CUSTOM SILK FLOWERS - Flora-craft wedding's w/that personal touch. Angel, 878-0106.

FRANKLIN WOOD STOVE - $50. John, Ext. 4312.

EXOTIC SHELLS - uncommon types from around the world. Whitey, Bldg. 197B or Ext. 2913.

VIDEO GAME - Pac Man portable unit by Midway, excel. cond. w/power supply, asking $40. Frank, Ext. 3120.

CONTEMPORARY LIVING ROOM SET - includes couch, loveseat, etagere coffee and end tables, $650. 924-0910.

BASEBALL GLOVE - small, for leftie; Humanic ski boots; Nike training cleats, ladies size 8 (narrow). Jane, 473-0961.

COLOR TV - RCA, 25" console, $200; BSR McDonald turntable, $30. 331-2022 after 6 p.m.

DRESSER - 2 dr., 29" high 28" wide; girl's old vanity table, good cond., $22 all; (4) metal standing kitchen cabinets, $10 ea. 878-6637.

GOWN - size 9, pleated, pale yellow, beautiful, worn once in wedding party, paid $75, now $45. 744-9677.

TROMBONE - 8 yr. old, Bundy beginner model, good cond. best offer over $125. Bob, Ext. 2350 or 475-4382.

DEHYDRATOR - for fruit & vegies, used once, $40; Quartz radiant heater, new, $42. Ext. 3131.

DINING ROOM TABLE - walnut, 58" x 40", with 2 leaves, (4) matching chairs, excel. cond. Ext. 4449 or 751-8403 after 6 p.m.

GE DRYER - heavy duty, electric, excel. cond., 220V. Peter, Ext. 2824 or 727-3218.

VERTICAL BLINDS - miniblinds, wovenwood shades. Jim Griffin, 281-2849.

LOG CABIN - outdoor playhouse with wooden floor, good cond., roof needs repair. Ext. 4449 or 751-8403 after 6 p.m.

CRAFTSMAN 10" RADIAL ARM SAW - with accessories, excel. cond., $275. Bob, Ext. 7772.

EASTER CHOCOLATES - decorated birthday, graduation or any occasion cakes, call for prices. Carol, 289-3917.

ELECTRIC HOT WATER HEATER - 52 gal., $25. Geo., Ext. 2022.

MEN'S 3-PIECE SUITS - size 46R, like new, $25 ea. 821-0080.

R/R TAPE DECK - plus 20 tapes, $70. Pete, Ext. 4819 or 289-7218.

COMFORTER WOOD & COAL STOVE - used one season, asking $395, cost $750.

744-5478.

PORTABLE PLAYPEN - rectangular, adjustable height, wheels, mesh sides, new cond., $35 firm. 929-3251.

ROYAL TYPEWRITER - elec., portable, like new, $80. 363-2736.

WROUGHT IRON RAILINGS - (2) heavy-duty, fancy for 4 foot 3 step stoop, good cond. 744-3792.

EASTER COOKIES - ($5/lb.) and bunny breads ($1.50/ea.) delivered to Lab. Adrienne, 654-4206.

STAMPS - souvenir pages 1976-1981 and internat. first day covers 1976-1977, reasonable. Ext. 3589.

WALNUT BREAKFRONT - china top, buffet bottom, solid brass hardware, 72", will deliver, $700. Carol, 878-0885.

WHITE SPINOLE BASSETT CRIB & CRADLE - playpen, super coup walker, five draw changing table, hi-chair, all like new. 654-3186.

KITCHEN TABLE & (4) CHAIRS - round, colonial maple table with ladderback chairs, $150. Ext. 2145.

BEDROOM SET - "Heritage", full size bed w/dresser, w/mirror, men's dresser,

2-nite tables, $1,000. B. Stars, Ext. 4278 eves. or 298-9648 weekends.

Yard Sale

CENTER MORICHES - Spring Craft Fair, quality workmanship, open Fri., Sat., Sun., 12-5 p.m., 49 Wading River Road. 878-0106.

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 Rent

MILLER PLACE - 1 bdrm. apt., living room/kitchen, private entrance, util. incl., avail. April 1st. Ext. 2537 or 473-1158 after 6 p.m.

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. or weekends.

SMITHTOWN PINES - near highways, beautiful 4 rm. apt., yard, private, avail. May 1, carpool to BNL also avail., $650 incl. all. Ext. 2676 or 543-0487.

WADING RIVER - sublet 4 rm. apt., one person, non-smoker, no pets, Aug. 1 thru Nov. 30, $400/mo. Janet, Ext. 2345 or 929-8152.

WADING RIVER - on the beach, 2-1/2 rm. furn. apt., all included, $350/mo. lease, April 1. 929-8443.

For Sale

SHOREHAM NORTH - 4 bdrm., 2-1/2 baths, full brick wall f.p., 2 car gar., 3/4 acre, low taxes, 8-1/2 assumable mtge. 821-0080 after 5 p.m.

LEISURE VILLAGE "GREENBRIAR" - 2 bdrm., good location, $51,000. 744-7140.

Car Pools

RIVERHEAD - join or start carpool, hours flexible. Peter, Ext. 2824 or 727-3218.

BABYLON/W. ISLIP - driver needed for on-time car pool, 8:30-5:00. M. Tesla, Ext. 2705.

FAR ROCKAWAY - Five Towns, Long Beach individual wishes to joint or start car pool. Aron, Ext. 3397.

COMMACK - 1 or 2 drivers, 8:30-5:00. Ted, Ext. 4030.

Free

OLD ENGLISH SHEEPDOG - w/papers, 2 yrs. old, female, needs good home. 473-5869.

FIREWOOD - you cut down trees and keep wood. John, Ext. 5152 or 281-2471.

PATIO CHAIRS - (4) heavy steel with rocker bottom and arms, and steel wheel barrow. 744-3792.

Wanted

MANIFOLD - alum. high rise for Ford 289-302; also 600CFM Holly carburetor. Rick, Ext. 3803.

WINCH - 1,000 lb. capacity, for boat trailer; seats for small boat, back to back. George, Ext. 5288.

MARINE GEAR - fittings, access., etc.; used lumber, nails o.k., need 2"x10", 2"x12" for header. Bill Sanchez, Ext. 3848 or 281-6498.

TIRES - C78-13 only, reasonable cond. Susan, Ext. 4267.

HOUSE OR APT. - close to Lab, married couple and baby. Ext. 3501 or 924-8722.

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

HOUSE OR CONDO - 2-3 bdrms. Ext. 2879 or 286-3718.

HAND LAWN MOWER - in good cond. W.L. Hughes, 286-3301.

FORMAL GOWNS - pastel, for costumes in school musical, reasonable. 878-9418.

MOTORS - 1976 and newer, Mercury outboards, parts or complete, top dollar paid. 654-0880.

DODGE DART - 1973-74, w/V8 and disc brakes, need k-frame and suspension parts. Ext. 3869 or 744-3577.

TRAVEL COMPANION - to tour the USA between May & July for 5 weeks, share expenses and driving. Marc, Ext. 3867 or 2570.

HOUSE TO SHARE - single professional, from May to Sept. at $250 to $350 1/mo. in the Hampton Bay to East Moriches area. Ext. 3123 or 3184.

80 TERCEL OR COROLLA - 5 spd., low mi. Debbie, Ext. 3420 or 736-4280 eves.

PIANO - Spinet or small upright. 281-7844 after 6 p.m.

DINING ROOM TABLE - dark wood, round or rectangular, good cond. 744-3792.

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
☐ Lost & Found
☐ Wanted
☐ Free
☐ _____

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.