BROOKHAVEN BULLETIN
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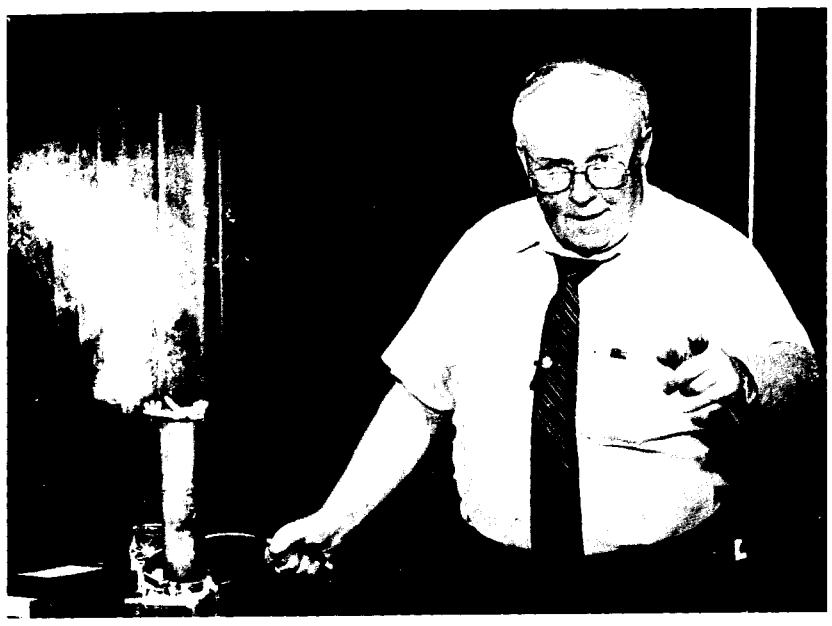
BROOKHAVEN NATIONAL LABORATORY



Roger Stoutenburgh

Forewarned Is Informed About Electrical Safety

Nearly 1,000 BNL'ers learned about the "dos and don'ts" of using electricity on August 25-26, from electrical safety expert and wizard showman Edward Eagan. Eagan, who is with the Boston office of the U.S. Department of Labor's Occupational Safety & Health Administration (OSHA), presented three 1½-hour, one-man shows — full of anecdotes as well as information — about electrical hazards and safety, especially in the everyday use of power tools and appliances, and in surprising situations. For instance, in this picture Eagan is seen making the point that any particulate — including corn starch — can become an explosive in the presence of an electrical spark.

Portraits of Chaos on Display

Science becomes art in an exhibit called "Portraits of Chaos," which the BERA Art Committee will present in Berkner Hall on September 6, 7 and 8.

The portraits are actually original drawings and computer plots from the early days of chaos research by Japanese scientist Yoshisuke Ueda. Ueda, who is on the Faculty of Engineering at Japan's Kyoto University, first became interested in chaotic motions in the early 1960's. He will be at the exhibit to answer questions about the drawings and computer plots that illustrate his work.

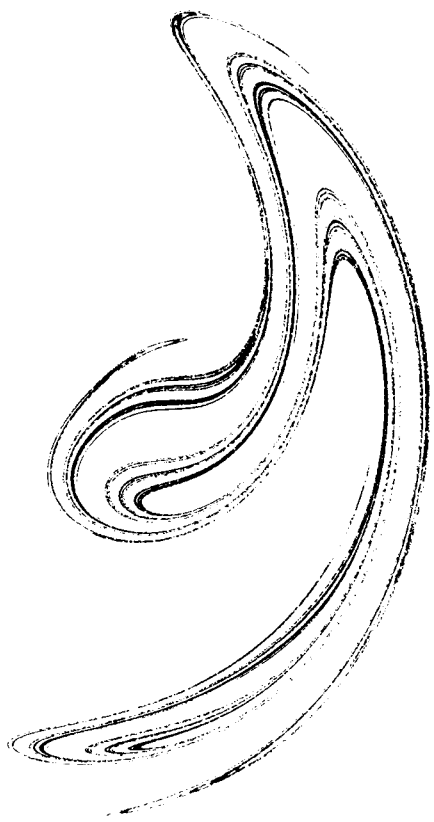
To help increase viewers' understanding and appreciation of these fascinating portraits, Bruce Stewart of the Applied Mathematics Department will give an introductory talk on "Portraits of Chaos: How to Read Them."

Stewart's talk is scheduled for 4:30 p.m., on Tuesday, September 6, in Room B, Berkner Hall, to coincide with the opening of the exhibit, from 4:30 to 7 p.m., in Room C. On Wednesday and Thursday, the exhibit will be open from 11:30 a.m. to 1:30 p.m.

In its mathematical sense, chaos is something produced by a dynamical system that doesn't seem to have anything random about it, but which behaves in a random way when it settles to a rhythmic pattern called a strange attractor.

One example is a dripping water faucet, which may either drip steadily, at regular intervals, or erratically, at random intervals. Such complex dynamical systems can also include the weather, the stock market and the national economy.

Ueda was one of the world's first scientists to recognize the significance of such complicated behavior in dynamical systems described by simple mathematical equations. In an article in the *International Journal of Non-Linear Mechanics*, he recalled, "It was on 27 November 1961 when I met with chaotic motions in an analog computer simulating a forced self-oscillatory system. Since then my interest has been held by the phenomenon . . ."



The computer painted this portrait of the strange attractor resulting from the Duffing oscillator studied by Yoshisuke Ueda: $dx/dt = y$, $dy/dt = -ky - x^3 + B \cos t$: where $k = 0.1$, $B = 12.0$; 100,000 points were plotted.

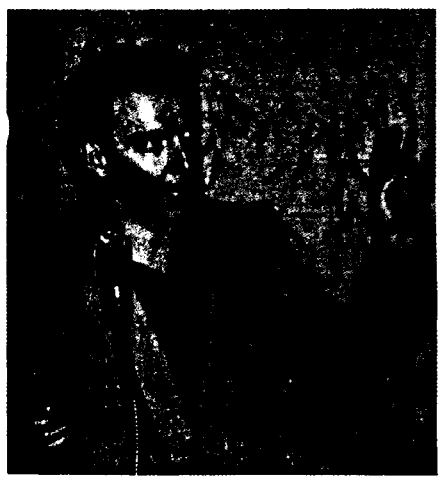
Thanks to the continuing work of chaos pioneers like Ueda, and with the help of ever more powerful computers, researchers are now applying the science of chaos to such complex systems as electrical circuit theory and sleep/wake cycles, with the hope of making the unpredictable understandable and, possibly, even predictable.

Ueda's portraits beautifully illustrate how unchaotic chaos can appear, hen one knows how to look. Included in this exhibition will be his plots from simulations of chaotic dynamics done as early as 1961; drawings of invariant manifold structures in forced nonlinear oscillators; and the spectacular large strange attractors made at the request of the National Museum of Sciences, Techniques and Industries, which opened in Paris in 1986.

Shroud of Turin Talk Next Week

It surfaced in approximately 1350, in the little town of Lirey, France — a linen burial cloth bearing an image. Was that cloth, known today as the Shroud of Turin, used to wrap the body of Jesus? Was the image of Jesus miraculously imprinted in the cloth?

The answers to these long-debated questions are now being sought by both theologians and scientists. One chemist who has already grappled with them is Robert Villarreal, Manager of the Analytical Laboratory at Argonne National Laboratory, West, in Idaho Falls, Idaho. Villarreal consulted on analyses of the Shroud of Turin done in 1978 and reviewed some of the proposals for the carbon-14 dating studies that are now drawing to a conclusion.



Robert Villarreal

Villarreal will draw on this experience in an afternoon colloquium he will give on the "Scientific Investigation of the Shroud of Turin." Sponsored by the AUI Lecture Committee, the talk will take place on Thursday, September 8, at 3:30 p.m., in Berkner Hall, while Villarreal is at BNL for a meeting of Department of Energy's Analytical Managers, being held September 6-9. All are invited to attend the lecture. A reception will follow.

In 1978, using x-ray and chemical techniques, scientists could not con-

(Continued on page 2)

Summer Science Draws to a Close

The Office of Educational Programs introduced a new Community Summer Science Program at the Lab this summer, and most of the 25 Suffolk County high school students who participated were on hand for this end-of-session photo. All of them attended the morning lectures given by Laboratory scientists throughout the six-week program, and about half also had afternoon internships, which gave them the opportunity to work in a research environment with a sponsoring BNL scientist.

—photo by Stoutenburgh

Inside Info

In attendance at the 19th National Training Program on July 28-30 in Baltimore, which was sponsored by Federally Employed Women, were BNL's Supervising Librarian **Carol Beckner,** Technical Information Division, and Senior Administrative Services Assistant **Bette Morgan,** Applied Mathematics Department.

Representing BNL, Beckner and Morgan were among 5,000 women employed by the federal government and its contractors at this three-day series of workshops. From the hundreds of seminars offered, they each attended five, on such topics as assertiveness training, effective communication and leadership dynamics.

Shroud of Turin (cont'd)

clusively answer the questions about the Shroud. Though they are more definitive, carbon-14 dating techniques were not used at that time because a handkerchief-sized piece of the 14 x3½-foot cloth would have been required.

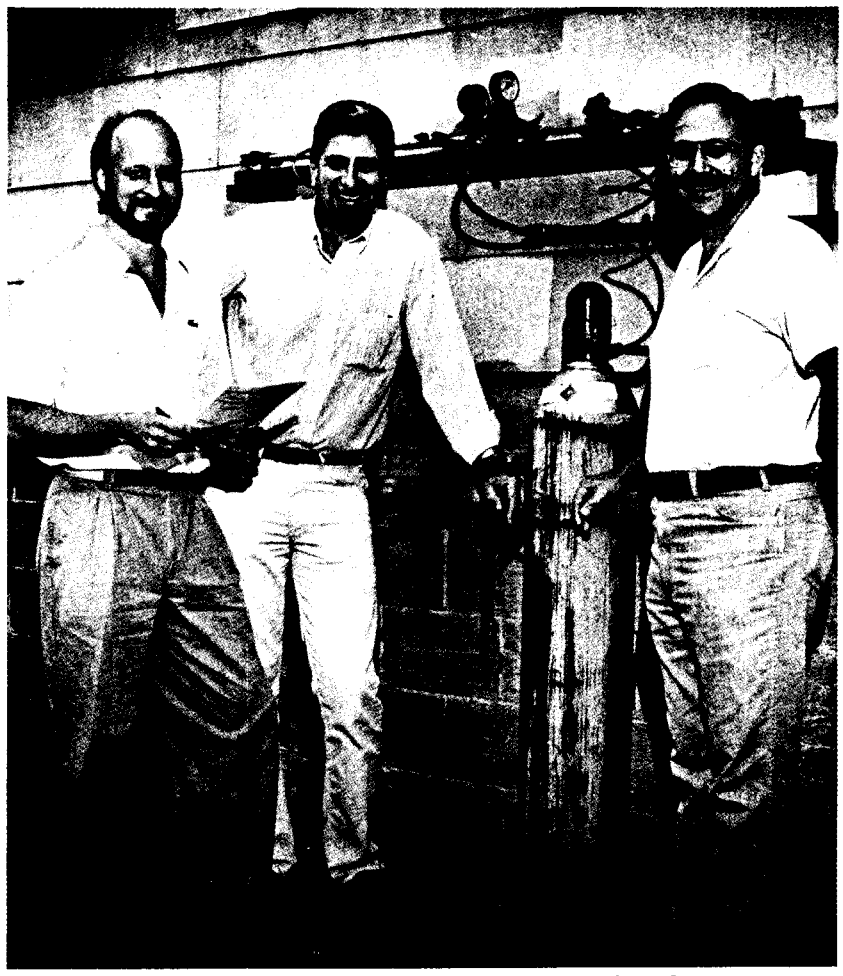
The dorsal and frontal image of the Shroud of Turin.

In carbon-14 dating, carbon atoms are separated within a sample. A count of the individual carbon-14 nuclei tells how much carbon-14 has been lost from the sample. The fact that carbon-14 decays at a known rate makes it possible to date the sample.

By 1986, new carbon-14 dating techniques had made it possible to test pieces about the size of a postage stamp. Under a Roman Catholic Church protocol, such testing was at first to be done by seven laboratories, including BNL. In a controversial move, however, the Archbishop of Turin eliminated four labs, including BNL. The remaining three laboratories have completed their tests, and the official results are expected to be released shortly.

"Carbon-14 dating can only determine the age of the Shroud, but it cannot determine whether it was the actual burial shroud of Jesus," Villarreal said in a phone interview. "There's no conclusive way to resolve the questions. The tests can only point in one direction or another."

In addition to discussing the known results of the many studies that have been conducted up to this time, Villarreal will present the historical background of the Shroud of Turin, recount legends and myths associated with the cloth's history, and explain the Old and New Testament symbolism involved.



Roger Stoutenburgh

Their Good Ideas Pay Off

Over the past few years, these three Department of Applied Science employees have used the Employee Suggestion Program (ESP) to provide the Laboratory with ideas that have aided in resolving the problem of costly deposits and monthly charges on compressed gas cylinders no longer in use. For their suggestions, (from left) Richard Wilke, Oceanography Associate; James Hurst, Senior Materials Science Associate; and Neal Carciello, Chemistry Associate, each received $100 from the ESP.

Original, cost-saving suggestions for the Lab are always welcome, and employees who submit new ideas will receive a "thank you" mug from the ESP.

Service Awards

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

Forty Years

Murray J. Klein	Reactor

Thirty Years

Benon H.J. Bielski	Chemistry
Leon Green	Nuc. Energy
Benjamin Magurno	Nuc. Energy
Paul A. Michael	App. Science

Twenty-Five Years

Richard Lehmann	AGS
Erno A. Ostheimer	Accel. Dev.
Robert L. Schuman	AGS
Robert J. Warkentien	AGS
George C. Warner	AGS

Twenty Years

Mary Doroski	MIS

Ten Years

Clement Auguste	Light Source
Roy A. Barone	S&EP
Eva S. Bozoki	Light Source
Robert A. Chmiel	Physics
Jan M. Collinson	App. Science
Walter DeBoer	App. Science
Pamela A. Esposito	Chemistry
Dennis Hall	DCP
Raymond C. Karol	Reactor
Ronald S. Longacre	Physics
Stephen V. Musolino	S&EP
Ronald J. Orsini	Central Shops
Charles Trabocchi	AGS
Neil A. Wade	AGS
Arlene Wolochuk	Director's Office
Martin H. Woodle	Light Source
John J. Woods	AGS

Arrivals & Departures

Arrivals

Ludwid Kowalski	Director's Ofc.
Janene L. Morrow	S&EP
Mary E. Riddick	S&MD

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

Departures

Nanette J. Connor	DAS
Hubert Frank	Central Shops
Deborah A. Spikes	Biology

Addled Addresses

- Maintenance Sueprintendent
  City of Upton
- Brookhaven Water Lab
- Brook Hawen Nat. Lab
- Brookhaven Lake
- Broodhaven National Lab
- Brookhaven Maximal Lab
- Borrkhaven Hat Lab
- BrookHaven Color Lab
- Brookhaven Natural Laboratory
- Breakhaven National Lab
- TV Viewer
  475 Brookhaven National Laboratory
- Brookhaven Not Sale
- Brookhaven National Cab
- U.S. Energy
  Brookhaven Natl Labs
- Life Source
  Brookhaven National Labs
- Brookhaven Natl Lab
  or Current Resident
- Brookhaven Mail Lab
- City of Upton
  Director of Data Processing
  City Hall
  Upton, NY
- Blue Caven
  National Laboratories
  Uptown, NY
- Stanford Linear Accelerator Co.
  20 Pennsylvania St.
  Upton, NY 11973

Also received were letters addressed to BNL at Troy, NY; Upjohn, NY; and Upper Yonkers, NY.

The Holiday Created by the States

You know that the Lab will be closed on Monday, September 5, for the Labor Day holiday, but maybe you weren't aware that:

- No federal legislature created the holiday.
- No Senator or Congressman sitting in Congress ever proposed that Labor Day should be a holiday in the States.
- Labor Day came into being through city and state action.

It's true that, on a June day in 1894, Congress passed, without discussion, an act making the first Monday in September of each year a legal holiday in the District of Columbia and the Territories. But no mention was made of a holiday in the states. By that time, however, 31 states had, on their own, designated the first Monday in September as a holiday.

How did it start? In May 1882, New York City union official Peter McQuire proposed the date for honoring "those who from rude nature have delved and carved all the grandeur we behold." He recommended observing Labor Day on the first Monday in September because "it would come at the most pleasant season of the year, nearly midway between the Fourth of July and Thanksgiving, and would fill a wide gap in the chronology of legal holidays."

McQuire's suggestion was adopted by the Central Labor Union of New York, and the first, unofficial Labor Day was held September 5, 1882.

The first state bill to set up the legal holiday was introduced in the New York legislature. But the state of Oregon moved faster and passed the first such bill into law in February 1887. During the same year, New York, Colorado, Massachusetts and New Jersey legislatures also created the holiday. By 1894, 26 more states followed suit, before the Congressional action.

The 48th state to pass a Labor Day law was Wyoming, in 1923; and Alaska and Hawaii honor it as a result of the Act of Congress, 94 years ago, when they were still territories.

team safety

Holy cow! Week seven in the Team Safety program* is here and the home teams had a full sweep of the games. As of the date of this report, there have been no field losses, although one player lost additional time but was still on restricted duty from the original injury.

Three Plant Engineering teams — Heavy Equipment Shop, Grounds and Roads and Steam Shop — may be the first pennant winners on September 12. Keep up the safe work!

The Supply & Materiel teams all remain undefeated, and their first winners could be on September 26. Central Shops, with three undefeated teams, is also looking for its first pennants that day.

Big rumor on the field is that another Division will soon join the league. Negotiations have begun for additional field space, and word is that their hitters are big guns.

Let's keep up the safe record of play!

**Twenty-five teams are participating in the Lab's Team Safety program. As five teams have incurred lost-time injuries, 20 are now in the running to be the first to be rewarded for their safe practices with a pizza or deli luncheon. Time goals ranging from 8 to 12 weeks have been established for the teams based on their previous lost-time frequency.*

Coming Up

"Ozone Depletion at the Ends of the Earth" will be discussed in a lecture by chemist Susan Solomon of the National Oceanographic & Atmospheric Administration, on Friday, September 16, at 3:30 p.m., in the Hamilton Seminar Room in the Chemistry Department, Bldg. 555. A reception will precede the lecture at 3 p.m.

All are invited to attend this talk, sponsored by Brookhaven Women in Science, which will be followed by a dinner at a local restaurant. For reservations, at $23 per person, call Joyce Tichler, Ext. 3801.

To Your Health

AIDS: Facts and Myths

AIDS, acquired immune deficiency syndrome, is one of the most serious health problems in the world today, and, unfortunately, BNL employees are not immune to this health threat.

However, AIDS is preventable. As it is not a casually transmitted disease, BNL employees cannot get AIDS from the usual workplace activities, and BNL employees with AIDS do not present a health risk to other employees in the workplace under usual work conditions.

Physician Laura Sbarra, head of the Occupational Medicine Clinic (OMC), will present these and other facts during the seminar "AIDS: Facts and Myths," on Wednesday, September 7, from noon to 1 p.m., in Berkner Hall. Sponsored by the OMC's Health Promotion Program, the seminar is open to the Lab community.

In addition, Sbarra will discuss the Lab's recently issued policy on this disease and answer any questions.

Sbarra will emphasize that BNL does not discriminate against employees or prospective employees with AIDS, that employees with AIDS are entitled to the same Lab benefits as other BNL employees and that employees with AIDS or those concerned about working with a coworker with AIDS may receive information and counseling at the Occupational Medicine Clinic.

Weight Watchers

A few spaces remain in the fall Weight Watchers class. If you wish to register, come to the first of the eight sessions, to be held on Wednesdays, starting September 7, from 5:15-6:30 p.m., in the Safety & Environmental Protection Division conference room, Bldg. 535. Fees are $50 for continuing members and $25 for new ones, as the Lab is splitting the cost with them. For more information, contact Health Promotion Specialist Elaine Friedman, Ext. 2699, Tuesdays and Thursdays.

To the Editor

It was good to see Virginia Pond [in the August 19th Bulletin] reminding us that there was indeed a Lindenmere before Imelda [Marcos]. However, the story would not be complete without taking note of what happened immediately after the early post-WWII period.

The Lindenmere became, and remained for many years, a cozy, old-fashioned resort hotel; the first-class restaurant, run by the Amendes as chefs and bakers, was open to the public. I put up both my parents and several friends at the Lindenmere on several occasions in the late 50's and early 60's, and I also remember having dinner there quite often.

One day, Mr. Amende showed me the guest book, which dated back to the BNL-housing days and included such signatures as Dwight D. Eisenhower, Robert Oppenheimer and I.I. Rabi, among others.

— Clemens Auerbach
Department of Nuclear Energy

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Tickets Going on Sale For Metropolitan Opera

On Wednesday, September 7, family circle tickets for certain performances of the 1988-89 Metropolitan Opera season will go on sale at the BERA Sales Office in Berkner Hall. Office hours are from 9 a.m. to 2 p.m. Employees may purchase as many *pairs* of tickets as they wish. All sales will be final; no refunds or exchanges.

Ticket Prices:

Tuesday and Friday evenings	$17.50
Saturday evening	$18.50

Schedule:

Date	Opera
Saturday, Oct. 1	*Giulio Cesare*
Friday, Oct. 7	*Giulio Cesare*
Saturday, Oct. 22	*Il Trovatore*
Tuesday, Oct. 25	*Gotterdammerung*
Friday, Nov. 4	*Cavelleria Rusticana* *Pagliacci*
Saturday, Nov. 5	*Gotterdammerung*
Tuesday, Nov. 15	*Il Barbiere di Siviglia*
Friday, Nov. 18	*Il Barbiere di Siviglia*
Saturday, Dec. 3	*Carmen*
Friday, Dec. 9	*Carmen*
Tuesday, Dec. 13	*Cavelleria Rusticana* *Pagliacci*
Saturday, Dec. 17	*Madama Butterfly*
Tuesday, Jan. 3	*Aida*
Friday, Jan. 13	*Le Nozze di Figaro*
Saturday, Jan. 14	*Hansel and Gretel*
Tuesday, Jan. 17	*Il Trovatore*
Saturday, Feb. 18	*Don Carlo*
Friday, Mar. 3	*Idomeneo*
Saturday, Mar. 4	*Salome*
Tuesday, Mar. 14	*Werther*
Friday, Mar.17	*Salome*
Tuesday, Mar. 28	*Rigoletto*
Saturday, Apr. 1	*Eugene Onegin*
Tuesday, Apr. 11	*Billy Budd*
Friday, Apr. 14	*Billy Budd*
Friday, Apr. 21	*L'Elisir d'Amore*

Golf Tournament

The sixth BGA golf tournament will be held on Monday, September 19, at the Indian Island, Suffolk County golf course. The tournament will be conducted as a two-person scramble. Contact John Usher, Ext. 2096, for starting times. Please call with at least your scramble twosome; tee-time priority will go to completed foursomes. Tee times are reserved for 10 a.m. through 12:30 p.m., so sign up as soon as you can. Deadline for sign-up is September 16.

Greens fees are $9 for Suffolk residents, $20 for nonresidents and $4 for senior citizens. Tournament entry fees are $1 for BGA members and $2 for nonmembers. All fees can be paid to the starter. Riding carts can be rented for $18 each, pull carts for $2 each.

Cafeteria Menu

Week of September 5

Monday, September 5
Labor Day
Snack bar service only — 9 a.m to 2 p.m.

Tuesday, September 6

Cream of zucchini soup	(cup)	.75
	(bowl)	.95
Pork chop chasseur w/1 veg.		3.10
Chicken chimichanga w/1 veg.		2.95
Baked fresh fish w/1 veg.		2.95
Hot deli: Pastrami	(bread or roll)	2.85
	(hero)	2.95

Wednesday, September 7

Chunky tomato soup	(cup)	.75
	(bowl)	.95
Southern-fried chicken w/1 veg.		3.05
Stir-fried beef Oriental		3.10
Hot deli: Corned beef	(bread or roll)	2.85
	(hero)	2.95

Thursday, September 8

French onion soup	(cup)	.75
	(bowl)	.95
BBQ brisket of beef w/1 veg.		3.10
Crabmeat cakes w/spaghetti		3.10
Meat cakes w/onions and 1 veg.		3.10
Hot deli: Breast of turkey	(bread or roll)	2.85
	(hero)	2.95

Friday, September 9

Fish chowder	(cup)	.75
	(bowl)	.95
Veal Parmesan w/spaghetti & garlic bread		3.10
Seafood Newburg over noodles		3.10
Hot deli: Fried fish on a bun		2.85

Going, going, gone!

If you missed the first one two years ago, here's a second chance to attend an Art Expo and Auction, where you can view and purchase artworks such as the one show here by Irving Amen. Other well-known artists to be represented will include Pablo Picasso, Salvador Dali, Norman Rockwell and Mary Vickers.

This entertaining and informative art event will be held on Saturday, September 17, in Berkner Hall. The artwork can be previewed beginning at 7:30 p.m., and the auction will begin at 8:30 p.m. It is sponsored by Brookhaven Women in Science (BWIS), as their sixth fund-raiser for the Renate W. Chasman Scholarship for Women.

The auction will be conducted by Marlin Art of Deer Park. The works on the auction block will include lithographs, oils, watercolors and enamels — all by established artists. The bidding will start as low as $40. Payment by check is preferred, though American Express, Master Charge and VISA will be accepted.

If you wish to browse instead of buy, your presence is more than welcome, as the Scholarship Fund's commission and its miminum take will be determined by the number of people at the auction.

The event is open to the public, and admission is a $5, tax-deductible contribution to the Scholarship Fund. Wine and cheese, soft drinks, coffee, tea and cookies will be served free of charge. And, after the last work is sold, a door prize donated by Marlin Art will be awarded.

Tickets may be purchased in advance from the following BWIS ticket sellers:

	Bldg.	Ext.
Penny Baggett	902B	5154
Nicole Bernholc	535A	2027
Eva Bozoki	725C	3701
Pat Carr	179A	7192
Harriet Castro	134D	5152
Maryann Castrogivanni	535A	3898
Alyce Daly	197D	5203
Rae Greenberg	510A	5564
Louise Hanson	815	7709
Mary Kinsley	426	5232
Ruth Ann Lutz	460	7774
Harriet Martin	477A	3487
Flo O'Brien	475	4953
Cindy Pohlig	459	3301
Sharon Spark	515	4111
Jean Stafford	185A	3336
Pat Webster	1005	4628
Bonnie Wesolowski	555A	4301

Note to Diners

The Lab will be closed on Monday, September 5 for the Labor Day holiday, and food services will be affected as follows:

The Cafeteria snack bar will be open from 9 a.m. to 2 p.m. on Saturday, Sunday and Monday, September 3-5.

The Tap Room at the Brookhaven Center will be closed Saturday, Sunday and Monday, but will reopen at 5 p.m. on Tuesday, September 6.

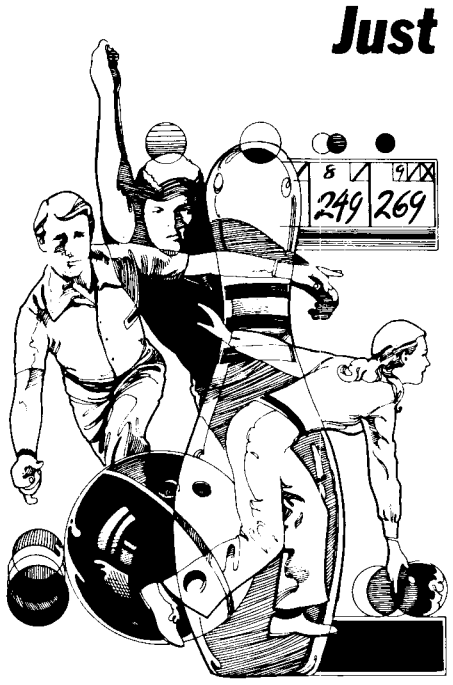
The vended food service in Bldg. 912 will be in operation throughout the Labor Day weekend.

Hospitality News

The next Hospitality Committee get-together will be held Tuesday, September 6, at 9:30 a.m., in the Brookhaven Center. Plans and suggestions for upcoming Hospitality Committee activities will be discussed. If you have any ideas, this will be a good opportunity to discuss them.

Spouses of Lab employees and guests are invited to join us. Please come and bring the children. Coffee, tea and danish will be served. Juice and cookies will be provided for the children.

Just Down Your Alley?



If you would enjoy getting together with coworkers to add some fun and excitement to your Thursday evenings — then you'll want to organize a team to play in the Mixed League of the BERA Bowling League. The season begins on Thursday, September 8, at 6:30 p.m., at the bowling alley in Shirley.

At this writing, the Mixed League can accommodate two more teams, each with a minimum of two women and two men. The Women's and Men's Leagues are both full, but all the leagues are always in need of substitutes.

For information or to sign up, call Maria Apelskog, Ext. 3138, or Fern Simes, Ext. 3969, by Tuesday, September 6.

Stockroom Closings

All Supply & Materiel Divsion (S&MD) stockrooms will be closed for inventory on Thursday and Friday, September 15 and 16. To give S&MD sufficient time to prepare for the inventory, all necessary stock withdrawals should be made prior to 5 p.m. on Wednesday, September 14. Emergency requirements should be processed through John Scharpeger, Ext. 2974.

Equipment Demo

Representative products from all divisions of Tektronix, Inc., will be shown at an equipment demonstration in Berkner Hall on Friday, September 9, from 10 a.m. to 3 p.m. Among the many products on display will be the company's latest offerings in digitizing oscilloscopes, spectrum analyzers, logic analyzers and color graphics terminals.

Classified Advertisements

Placement Notices

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

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

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

For further information regarding a placement listing, contact the Employment Manager, Ext. 2882.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

2935. ASSISTANT BUYER POSITION - Requires a bachelor's degree in business administration or equivalent experience. Will be responsible for the economical and efficient procurement of tangible commodities with low monetary value. Will coordinate procurement from requisition to delivery in accordance with standard operating procedures. Contracts and Procurement Division.

2936. OFFICE SERVICES POSITION - Requires excellent communication skills as well as some knowledge of scientific vocabulary and BNL programs. Will provide general information and assist scientific staff in locating library materials. Additional duties will include checking and shelving materials and photocopying for users and division. Knowledge of catalog use and arrangements helpful. Technical Information Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2937. SCIENTIFIC ASSOCIATE - Requires BS or MS in chemistry, environmental chemistry or oceanography, or equivalent experience. Responsibilities will include development of gas chromatographic separations for a wide variety of natural and anthropogenic volatile halocarbons in seawater. Must be able to spend limited periods at sea. Previous gas chromatography experience required. Department of Applied Science.

2938. ENGINEERING POSITION - Requires a BS in mechanical engineering and a minimum of five years experience in the design of HVAC systems, process piping, fire protection, and underground utilities. Duties will include the preparation of engineering drawings and specifications for bidding and construction purposes, and the development of project scope through direct user contact. Plant Engineering Division.

Motor Vehicles & Supplies

87 CHEVY SPRINT - stick shift, am/fm stereo cass., 2-dr., good cond. Walter, Ext. 3499 or 757-6392.

87 HONDA REBEL - must sell, low miles, $1,500 or take over payments. Jim, 874-4159.

87 MAZDA RX-7 - power sunroof, 21k mi., asking $12,500. Ext. 4837 or 289-4980.

87 IROC-Z - 350 cu. in., a/t, o.d., tinted glass, fully loaded. 286-9456.

86 SUBARU GL-10 WAGON - turbo, 4wd, 5-spd., 48k mi., loaded, mint, 4-yr. warr., asking $10,950. Henry. Ext. 4547 or 727-7227.

86 AUDI 4000S - 4-dr. sedan, black, a/c, p/s, p/w, sunroof, 5-spd., am/fm cass., alum. wheels, 55k mi., $9,000. 281-5565.

86 HYUNDAI - 5-dr., a/t, a/c, am/fm cass., 17k mi., $5,000. Ext. 3089.

86 VOLVO 240GL WAGON - a/t, full pwr., leather, cruise, am/fm, 18k mi., 70k warr., perfect cond., $16,990. 728-0273 eves.

86 CAMARO - fully loaded, custom woodgrain dash, T-tops, alarmed, red/silver, 26k mi., $8,950. Ext. 4962.

86 KAWASAKI KLR600 - on/off road, 1,500 mi., elec. start, w/2 helmets & cover, immac., $2,000. Bob, 874-2131.

85 FORD RANGER PICKUP - 6 cyl., 5-spd., long bed, low mileage, excel. cond., $5,400. Darrin, 765-5220 after 6 p.m.

85 FORD ESCORT - blue hatchback, 4-spd., 43k mi., am/fm, good cond., $2,500. Mike, Ext. 3855 or 3010.

84 LeSHARO WINNEBAGO - 19' motor home, fully equipped, sleeps 4. 475-0509.

84 FORD F-150 PICKUP TRUCK - 4wd, 4-spd., 351 engine, asking $8,000. 929-8467 after 5 p.m.

84 CADILLAC COUPE DeVILLE - rebuilt engine, all new parts, asking $5,500. 289-4980.

83 TOYOTA CELICA LIFTBACK - a/t, cruise, am/fm, 65k mi., clean, $5,200. Witkover, Ext. 4607 or 368-0452.

83 RENAULT ALLIANCE - am/fm cass., excel. cond., 47k mi., runs well, $1,950. Weber, 744-8655.

83 KAWASAKI 750 LTD - 4-cyl., 2k mi., excel., like new, asking $1,700. 654-0889 or 924-0651.

83 BUICK REGAL - a/c, p/s, p/w, am/fm, champagne landau top, excel. cond., $4,000 neg. Bob, Ext. 7238.

83 CHEVY S-10 - 4-spd., very good cond. 325-0447 after 6 p.m.

82 PLYMOUTH RELIANT STATION WAGON - very economical, excel. cond., 75k mi., $2,500. Yosepha, Ext. 3403 or 3129.

82 VW RABBIT - 4-dr., am/fm stereo, excel. cond., $1,750. Mark, Ext. 4289.

82 DODGE 024 - 2-dr. hatchback, 4-spd., sporty, body excel., $950. 471-4665, 467-2422.

81 CUTLASS SUPREME - black, new engine, 18k mi., mint cond., $3,500 firm. 331-3434 before 3 p.m.

80 BUICK REGAL - needs motor, body in good cond. and new rebuilt trans., $500. 286-1385.

80 CHEVETTE - 4-dr. hatchback, 4-cyl., a/t, am/fm, good tires, good running cond., orig. owner. Ext. 2055.

80 BUICK SKYLARK - excel. cond., 76k mi., rebuilt trans., price negotiable. Ext. 3851.

79 MALIBU CLASSIC - 4-dr., p/s, p/b, a/c am/fm, V-6, 57k mi., $1,700. 758-6919 after 5 p.m.

79 DATSUN 210 - 196k mi., runs well, some rust, damage, asking $300. Joe, Ext. 2214 or 2705.

79 COUGAR XR-7 - fully loaded, must sell, new car arrived, make offer. Tony 698-9274 after 6 p.m.

79 FORD FIESTA - 4-spd., stereo cass., good cond., asking $500. Mark, 286-0407.

79 JEEP CHEROKEE - 4wd, standard trans., good body, engine fair, $1,500. 345-3915 eves.

78 HONDA - good transport, 5-spd. Ext 3569 or 929-8143.

78 HONDA CIVIC - good cond., moving sale, $550. Ext. 3856 or 4896.

78 SUZUKI GS750 - many good parts, $100 as is. Bob, Ext. 5010.

78 OLDS CUTLASS SUPREME - 8-cyl., fully equipped, new trans., excel. cond., orig. owner, $1,900. Ext. 4449 or 751-8403 after 6 p.m.

74 FORD F-350 PICKUP - cap, dual tanks, good work truck. 924-7262 after 6 p.m.

74 MGB GT - very good cond., 72k orig. mi., $3,100 or best offer. John, 286-9334.

73 VOLKS BEETLE - runs, needs body work, asking $300 as is. George, 924-9656.

72 BUICK GS - collectible, 60k mi., new paint & vinyl top, $5,250, excel. Ext. 2198 or 744-4662.

71 FORD TORINO - 2-dr., a/t, p/s, p/b, 76k mi., $450. Pete, Ext. 2498.

70 FURY III - 71k orig. mi., one owner, $250. Miriam, Ext. 3186 or 4581.

67 MUSTANG FASTBACK - new tires, exhaust system, brakes, needs work, $600. 584-6002.

39 PLYMOUTH - 2-dr. sedan, 86k mi., reg. & inspected., needs paint, $1,939. Frank, Ext. 2022 or 399-4480.

SCUFF GAUGE - large size, measures wheel alignment for NYS inspection, checks toe-in/out, $50. Dan, Ext. 4987.

TIRE - Goodyear Wrangler, new 195-75R15, $30. 929-4326.

Boats & Marine Supplies

34' HOUSEBOAT - excel. cond., priced to sell. Ext. 2939.

29' ULRICHSON - wood, excel. cond., f.b, fwc, 327, runs well, sleeps 5, range/oven, elec. head, many extras, must see. 732-2754.

22' GRADY WHITE SEAFARER - w/tandem axle trailer, easy load, brakes, power winch, 2.6 ltr., omc seadrive, like new. 537-3606.

18' MACHI BOWRIDER - 1986, 140 h.p., I/O Mercruiser, seats 9, $7,000, mint cond. 399-0969.

17' SPORTCRAFT BOWRIDER - 1981, deep V, 470 Mercruiser I/O, full canvas, trailer, life jackets, anchor, v.g. cond., $5,000. 878-1580 after 6 p.m.

9' SAILING DINGHY - w/sails, $650, w/optional 2.7 h.p. motor, $850. 366-0021 after 5 p.m.

8' SKIMMER - fiberglass sailing dinghy, oars, oarlocks and sail, $350; Bristol 33 aux. sailboat w/slip in Greenport. Ext. 2405.

OUTBOARD MOTOR - J.C. Higgins, 7½ h.p., $100. John, Ext. 7671 or 765-1299.

OUTBOARD MOTOR - 15 h.p. Evinrude or Johnson short shaft. Joe, beeper 925 or 728-1859.

ANCHOR - Danforth-type, $20; 4 misc.-sized air fenders, $15. Ext. 3794.

WINDSURFER - 4.0m sail and accessories, good cond., $190. Bill, Ext. 7961 or 929-3082.

ACHILLES 4-MAN INFLATABLE - excel., complete, $325; 3 h.p. Seagull o.b., good cond., $400. Ext. 2405.

Miscellaneous

DRESSER - w/mirror, hardwood, pecan finish, good cond., $125. Scott, Ext. 3369 or 758-7114.

DECO BUREAU - chifforobe, $100; ping pong table, $50; sofa w/slip cover, $50; 10-spd. man's bicycle, $60; bench press, weights, $75. 878-6637.

OVAL MIRROR - antique, gold leaf, $75; child's crib, new $45; coffee table, $20. 744-2203.

KITCHEN SET - table, 4 chairs, good cond. 325-0447 after 6 p.m.

BEDROOM SET - maple dresser, chest, 2 night tables, desk, chair, mirror, full headboard, $400. 584-6002.

EARLY AMERICAN SOFA - chair, very good cond., La-Z Boy recliner. 475-0509.

WASHER & DRYER - Speed Queen, contemporary size, 2 yrs., $300. Ext. 3089 or 2312.

REFRIGERATOR - 20.5 cu. ft., white, frost-free, good cond., top freezer, $125. Ernie, Ext. 3357 or Noreen, 878-6921.

REFRIGERATOR - GE side-by-side, avocado, U-haul, $150, good cond. Ellie, Ext. 3395 or 325-1537.

WASHER - Kenmore, heavy duty plus, lightly used, excel. cond. Ext. 2710 or 331-7350.

COLOR TV - Zenith, 19", $80; exercise bike, good cond., $40; desk, $15. Yosepha, Ext. 3403, Ext. 3129 eves.

COLOR TV - 14", good cond., $90. Susanne, Ext. 3118.

LAWN MOWERS - Sunbeam 19" cut, $50; Mastercut 22" cut, 3½ h.p., $80; Huffy lawn tractor, 8 h.p., 32" cut, $250. Dan, Ext. 4987 or 698-7322.

ALUM. STORM & SCREENS - 4, 21"x36"; 4 windows, 21"x36", unassembled, $20 lot, 4 outside frames, 24"x39", free. 281-7844.

WOOD WINDOW - one over one w/storm & screen, opening 38"x41", $30. 924-3565.

TOPSOIL - fine screened, $18 per yd. delivered, also peat moss, sand, gravel, blend. 924-9427.

ACETYLENE WELDING OUTFIT - cyl's cutting & welding torches, cart, regulators, etc., $200. 281-8040.

COLLIE PUPPIES - champ-sired, sable white cuties, health/eye check, shots, raised with kids, $375. 924-3756.

BICYCLE - BMX 24" Huffy, black padded bars, hand & foot brakes, excel. $55. Jerry, Ext. 7427 or 475-5591 eves.

TANDEM BICYCLE - good cond., $60. Ext. 5038.

TREADMILL - w/rails, nonmotorized, good cond., asking $80. You pick up. Ext. 2198 or 744-4662.

EXERCISE BICYCLE - DP, excel. cond., low mileage, $40. Bob, Ext. 4749.

AEROBIC SHOES - Nike Conditioner, woman's size 6, never worn, orig. $32, asking $20. Elaine, Ext. 5329.

POOL COVER - for 18' round pool, asking $25. Bob, Ext. 7238.

VIOLIN - 6 yrs. old, v.g. cond., best offer over $150. Dave, Ext. 3093 days or 281-0062 nights & weekends.

PIANO - console, $800; Panasonic stereo, $50; color TV, 16", $70. Ext. 3089.

SKIS - Blizzard, Salomon bindings, Nordica boots. 758-6892 after 6 p.m.

ELECTRIC TYPEWRITER - Olivetti Editor II, $25; Wilson T2000 tennis racket, $5, bicycle handlebar bag, $10. Ext. 7570.

RECEIVER - new, Akai, very powerful, $200 firm. 874-4159, leave message.

WORD PROCESSOR - Brother with 3.5" disks, $500 neg. 286-0969 after 6 p.m.

PACKING CARTONS - assorted sizes. 286-3911.

AIRLINE TICKET - to Chicago, IL, Austin, TX, Sept. 3 from Islip. 331-7679 after 6 p.m.

UNDERSTANDING PSYCHOLOGY - 24 vol., modern, up-to-date, profusely illustrated, $25. Al, Ext. 2043.

Lost

SILVER RING - w/blue star sapphire, lost at Field 4. Reward. Ext. 3569.

Free

KITTENS - 10 weeks old, litter-trained. 821-6916.

Yard Sales

CENTER MORICHES - corner of Main St. & Railroad Ave., 9 a.m.-4 p.m., Sat. Sept 17, rain date, Sept. 24. 878-2239.

RIDGE - craft sale, Ridge FD, Rt 25, Sept. 10, 10 a.m.-5 p.m., vendors also need. 924-8143.

SHIRLEY - Sept 3-4-5, 9 a.m.-4 p.m., 167 Grand Ave., misc. items, furniture, tools, china, glassware. 281-8118.

Car Pools

COMMACK - want to start or join a car pool. Conrad, Ext. 4754.

PLAINVIEW AREA - 4th driver needed. Elliott, Ext. 2495.

Real Estate

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

For Rent

BELLPORT - 2 rm. studio w/eik and priv. ent., $450 mo., all included/one mo. security. 286-1385 after 6 p.m., or leave message between 8 a.m.-6 p.m.

BELLPORT - very large studio apt., priv. ent., parking, washer/dryer, beautiful yard. Avail. immed., $550/mo. includes all. Paul, Ext. 2361 or 286-7690.

E. SETAUKET - one bdrm., l/r w/fp, gallery, kitchen, furnished, single, non-smoker, $475 plus gas. 473-8588.

MANORVILLE - one bdrm. apt., kitchen, l/r and bath, private and clean, 2 mo. security, $550 incl. util. Annamarie, 728-0869.

MASTIC - 3 rm. apt., avail. Oct. 1. 281-7678 after 6 p.m.

MASTIC BEACH - 3 bdrm. house, quiet neighborhood, fenced yard, 10 min. from Lab, $750 + util. 281-4372 or 212-777-3449.

MT. SINAI - 1 bdrm. apt., waterview w/deck, $850 incl. util., avail. 9/15. 473-1761.

PATCHOGUE - 2 bdrm. ranch, 1 bath, l/r, d/r, eik, full bsmt., fenced property, $750 + util. 475-3406.

PORT JEFFERSON - Harbor Hills, 3 bdrm., 2½ baths, l/r, d/r, eik, fam. room, encl. patio, furnished, starting Oct., $1,000/mo. + util. Ext. 4932 or 928-8993.

SOUND BEACH - new 1 bdrm. apt., priv. ent., parking, full bath, eik, cable, single, non-smoker, $525/mo. all, 1 mo. sec. Ext. 7918 or 744-3068.

S. JAMESPORT - cozy cottage, 1 bdrm., l/r, eik, bath, porch, furn., suit. couple, walk to beach, 20 miles from Lab, no children/pets, $500/mo. + util. Walt, Ext. 2907 or 698-0576.

YAPHANK - 3 bdrm. ranch, den, deck, quiet neighborhood, $950/mo. 924-4872.

CATSKILLS - 3 bdrm. chalet w/sleeping loft, fully furn., near Hunter Mt., Windham, hunting, hiking, fishing, fall foliage. Kay, Ext. 4501.

HILTON HEAD, S.C. - 2 bdrm. condo, sleeps six, pool, tennis, golf, beach, Sept. special 350/wk. 585-9149.

For Sale

BELLPORT - 4 bdrm., 3½ baths, Jacuzzi, in walking distance of schools, bay and village, avail. unfurnished Oct. 1. 363-8936, eves.

MEDFORD - 3 bdrm. Colonial, 1½ bath, center hall, l/r, d/r, den, eik, 1-car gar., ½ acre, fenced backyd., $152,900. 286-1571.

MIDDLE ISLAND - Artist Lake condo, 1 bdrm., l/r, kit., bath, a/c, new w/w, dishwasher, clubhouse, sauna, pool, gas heat, 5 min. to Lab, $82,500. Ext. 3144 or 234-2240, 698-5046 eves.

SHOREHAM - 3 bdrm. ranch, carpeted, pool, eik, wood/coal stove, priv. fenced backyd., 2½-car gar., low taxes, SWR schools, clean, move-in cond., $135,000. 744-9677.

SHOREHAM - 3 bdrm. ranch, gar., a/g pool, ½ acre fenced yd., all appl., patio, 10 min. to Lab, SWR school, $137,000. 821-3373.

WADING RIVER - 3 bdrm. ranch, excel. cond., 2 baths, l/r, d/r, eik, 3-car gar., bsmt., screened rm., 1 acre, fenced, SWR schools, $175,000 neg. 929-3251.

WADING RIVER - large cape on ½ acre + rustic wooded lot, 3-4 bdrm., 2 baths, d/r, l/r, den, fam. rm., w/fp, finished bsmt., 2-car gar., SWR schools, principals only. 929-6748.

WADING RIVER — 3 bdrm. ranch, eik, d/r, l/r, solar, ¼-acre, low taxes, walk to Sound, excel., $135,000. 929-3207.

YAPHANK - 3 bdrm. townhouse condo, priv. ent., end unit, brick front, full bsmt., attached garage, cac, w/w, 5 appl., pools, tennis, clubhouse, many extras, $123,900. 924-0612.

N. PORT RICHEY, FL - 5 bdrms., 5 baths, (1 w/jacuzzi), l/r, d/r, custom kit., all appl., fam. rm., fp, w/w, 3 a/c, 2-car gar., patio, pool, 1-¼ acres, $195,000. 813-862-6262 or 698-0576.

ROCKLEDGE, FL - beautiful 2 bdrm., 2 bath, 2-car gar., fam. rm., porch, w/w, carpet, shades, some drapes, appliances, $64,500. 407-631-2840.

Wanted

ROOMMATE - Mastic Beach, quaint 3 bdrm. house, 10 min. from Lab, reliable, non-smoker, $450. 281-4372 or 777-3449.

BABYSITTER - for 6-yr.-old girl, 2-3 nights, incl. weekend, Holbrook near Sun Vet Mall. 567-7752.

BASEBALL CARDS - will buy cards in good cond. 467-0888.

BOY SCOUT UNIFORMS - sizes 12 up and men's med., W36. Ext. 4105.

COMMODORE 1541 DISK DRIVE - for C-64 computer or color monitor. Paul, Ext. 4665 or 727-4859.

DEHUMIDIFER - John, Ext. 7671.

OLD LAWN MOWERS - complete. Dan, Ext. 4987 or 698-7322.

CEMENT MIXER - Wet Saw/Bobcat, to buy or rent. Tony, 698-9274.

SUBMERSIBLE WELL PUMP - reasonable. Al, Ext. 2043.

COLOR TV - Ext. 2229 or 3073.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommeded by the **Bulletin.**

CALLIGRAPHY - for all occasions, envelopes, invitations, place cards, etc. Andrea, 821-0260.

JEWELRY REPAIR - gold and silver, rings, chains, etc. Dan, Ext. 2319.

RUG SHAMPOOING - very reasonable, Lab discount. 924-6019, leave message.

CHILD CARE - loving mother will care for your child full-time, reasonable rates, 7 min. from Lab. Dawn. 395-5158.

KAYAK LESSONS - Sea Kayak, River Slalom equip. provided, 5 lessons, $70. Tim, 281-7873 or Ernie, Ext. 3357.

MATH TUTORING - NY certification. 821-0686 eves.

RENOVATIONS - house plans, drawings, design, blueprints, permits, custom design your alteration according to your specifications. 475-6981.

SHEETROCKING & SPACKLING - free est., reasonable prices. Kevin, 563-9855.

HOME IMPROVEMENTS - renovations, extensions, decks, windows, skylights, free estimates, references avail., licensed & insured. 744-3068.

BRICKWORK - patios, walks, swimming pools. Belgian block, landscape ties, retaining walls, Lab discount. Tony, 698-9274.

LOCKSMITH - full sales and service, bonded, 10% discount for BNL employees. Pete, 399-2813 after 5 p.m.

TYPING — done on IBM PC using Wordperfect software, 20 years combined experience, rates are reasonable. 286-0969 or 286-3604.

WORD PROCESSING - papers, letters, resumes, quality work, reasonable rates, 12 years secretarial experience. 924-2012 after 6 p.m.

VAN & DRIVER FOR HIRE - will pickup or deliver, very reasonable. 744-5387 after 6 p.m.

PARTY TENTS FOR RENT - we set up & take down. Fred Kuehl, Ext. 7947, beeper 792 or 588-2268.

WELL DRILLING - we install, service & repair wells, pumps & tanks, 10% off. 369-0004 or 751-7492.