BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Reactor Safety: Combating Corrosion

When a nuclear reactor fails, the reactor doesn't explode. Most often, a pipe, a valve, or some such nut and bolt part gives up, the reactor loses pressure, and the plant is automatically shut down.

Those same nuts and bolts, when carefully studied, can reveal the underlying cause of the failure, according to John Weeks, head of the Corrosion Science group in the Department of Nuclear Energy. Weeks, along with Rabindranath Bandy, Roger Newman, Carl Czajkowski and Louis Gerlach, who make up a subunit in the larger group, provides technnical assistance to the Nuclear Regulatory Commission.

Before the NRC will permit a plant to be restarted, the agency must determine if the conditions which caused the malfunction have been eliminated. Week's group does independent failure analyses, which are used by the NRC in determining if a plant can safely return to operation.

At any given time, the group is studying parts from various plants. Most recently, Bandy and Newman have been working on Three Mile Island Unit I.

As Newman explained, Unit I was already shut down in 1979 when Unit II malfunctioned and made headlines across the country. Thirty months later, Unit I's steam generators were tested and found to have several thousand cracked tubes. What had happened in the interim, when the plant wasn't operating? The NRC asked the BNL group to find some answers.

Newman says the cracked tubes were linked to a tank of sodium thiosulfate, one of the plant's emergency back-up systems for cooling the reactor core. The sodium thiosulfate had leaked into the reactor coolant.

Bandy and Newman found that sodium thiosulfate, in a solution as dilute as one part in three million, causes cracking in a few hours when it comes into contact with the material out of which Unit I's steam generator tubes are made. Inside the cracks, the thiosulfate is so concentrated, it becomes very corrosive.

Using basic research done by themselves and others in the corrosion group on this type of cracking, Bandy and Newman concluded that lithium hydroxide should be added to water circulating in the tubes. The lithium hydroxide prevents sulfur from concentrating in any cracks, thereby eliminating the localized corrosive environment. Their suggestion has been implemented, and their work continues to be used in evaluating the start-up of the reactor.

The problem of stress-corrosion cracking occurs in all aspects of energy generation, says Newman. Radiation doesn't enter the picture. Metal structures under stress will crack in particular corrosive environments. And even pure water can be quite corrosive when paired with the right stressed metal.

Earlier this year, the NRC asked the group to do an independent failure analysis of the Ginna power plant in upstate New York. According to Weeks, it was a rather sudden request, with time pressure involved so the plant could quickly return to operation again, but safely. With Carl Czajkowski directing the effort, a team was assembled, including Louis Gerlach, Ken Sutter and Don Becker, technicians in the corrosion group. Thanks to help from Metallurgy, Safety and Environmental Protection Division, and Photography, the analysis was done in two weeks. Czajkowski wrote and submitted a report to the NRC, which was then used in support of their evaluation that the plant was safe to return to operation, which it did in June.

Czajkowski sums up the plant's failure as due to mechanical damage. He says pieces of carbon steel, which were dropped in the steam generator when it was open earlier for routine work, repeatedly hit outer tubes in the generator, tubes that had been capped off and were not functional. The outer tubes severed, leaving stalks that whipped back and forth, rubbing against more tubes, until finally a live tube was broken.

Besides Ginna and Three Mile Island Unit I, the group has also analyzed assorted pieces from other reactors -- bolts from Maine Yankee and Robinson, cracked turbine discs from Yankee-Rowe and Cooper, and cracked feedwater nozzles from steam generators at nine reactors. In all cases, says Weeks, "the component has failed, we now know why, what to do about it, how to reduce the chances that it will happen again, and what steps to take if it does."

Beginning with work on feedwater nozzle problems, the group has been doing failure analysis for the past four years. Other researchers in Corrosion Science study more fundamental aspects of corrosion failure and also materials performance.

Weeks says materials in existing reactors are not ideal, and better materials can be used today. But there are virtually no new plants being designed, and the existing plants have many years left to run.

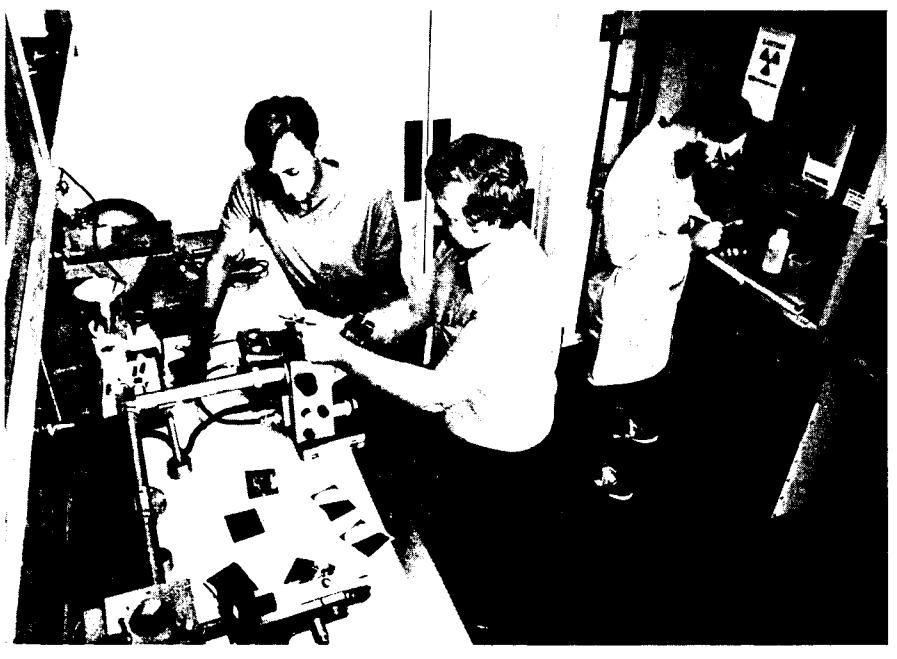
Weeks believes these reactors can be kept running safely "if we continue to work on improving our understanding of the phenomena that have caused past problems.

"Our experience shows that a cracked pipe leaks long before it ruptures, and these kinds of failures are often found in routine inspections. Even if leaks do develop in service, the resulting problems are more operational than safety, provided corrective actions are taken before degradation becomes too widespread."

Cross sectional photomicrograph showing extent of damage to a collapsed tube from the Ginna power plant. The insert shows the section of the tube which was photomicrographed.

Mort Rosen

Rabindranath Bandy (left) and Roger Newman, who are working on a stress-corrosion cracking problem at Three Mile Island Unit I.



Mort Rosen

From left, Louis Gerlach, Carl Czajkowski and Ken Sutter, some members of the team that did failure analysis of the Ginna nuclear power plant.

Soc. Sec. # Required

Connecticut General Insurance Co., the medical insurer for the Laboratory's employees, is now using a new computer system to process medical claims. This system requires that an employee's social security number be included on all claim forms and all bills. If this number is missing, payment will be delayed, so employees are reminded to include their social security number when submitting any future medical bills or forms for payment. Anyone with questions should call Personnel Services, Ext. 2877.

Inside Info

Maurice Goldhaber, AUI Distinguised Scientist, had a good idea last winter and mentioned it to Harold Furth, director of the Princeton Plasma Physics Laboratory. As recounted in the August 1982 issue of Physics Today, Goldhaber, who, in 1934, for the first time considered the role of nuclear spin in the probability of nuclear reactions, wondered whether Furth "had ever considered polarizing the nuclear spins in a magnetically confined reactor plasma." This was the catalyst which led to some team work with Russell Kulsrud and Ernest Valeo of Princeton "to calculate the depolarization rates that would result from various mechanisms in a toroidal or mirror fusion reactor, and to examine the benefits one could expect from various polarization schemes." So far, their conclusions have been surprising, finding that "a polarized D-T, D-D or D-He^3 plasma would maintain its polarization against collisions at better than 95% for about 100 seconds in a magnetic fusion reactor—five times the life expectancy of a plasma nucleus in a tokamak." Commenting on the group's work, Furth told Physics Today, "We don't yet know whether all this will work, but it illustrates that there are still fundamental new ideas to be explored in magnetic-confinement fusion. It's not all just engineering details. This is, I believe, a message of good cheer."

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Joseph Hendrie, BNL senior scientist and former chairman of the U.S. Nuclear Regulatory Commission, was recently selected by the American Nuclear Society to chair a special committee on reactor priorities. Among the issues the 14-member committee will consider are reactor safety and possible improvements in nuclear plant cost reduction and efficiency. The committee will also recommend issues for particular ANS emphasis. Currently, the term of each member runs through June 1983.

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Arthur Schwarzschild, chairman of the Physics Department, has been elected a Fellow of the New York Academy of Sciences. Election to Fellowship is a distinction conferred by the Academy's Board of Governors on a limited number of members who have attained outstanding recognition for scientific achievements or for the promotion of science. An experimental nuclear physicist, Schwarzschild has been on the staff of the Physics Department since 1957, and has enjoyed a long association with the Tandem Van de Graaff facility, both in its assembly and subsequent research.

Doug Humphrey

The Subcommittee for Assessment of Isotopic Composition (SAIC) of the International Union of Pure and Applied Chemistry (IUPAC) met at Brookhaven last week. The subcommittee met to prepare an element by element review of all data on isotopic composition and atomic weight for all the chemical elements. Their findings will be presented next summer at the 32nd Biennial General Assembly of IUPAC in Lyngby, Denmark. Above, Lab Director Nicholas Samios (left) chats with conference participants Paul DeBievre (Belgium), who chaired the meeting, DNE chairman Herbert Kouts and DNE staff member Norman Holden who is president of the International Commission on Atomic Weights and Isotopic Abundances.

Metropolitan Opera Tickets

Tickets for the 1982-83 Metropolitan Opera season will go on sale at the BERA Sales Office in Berkner Hall starting at 8 a.m. on Wednesday, September 1.

An employee may purchase as many pairs of tickets as desired. Ticket prices (including 50¢/ticket service charge) are as follows: Monday through Thursday performances, $11.50, Friday and Saturday performances, $12.50

All sales will be final — no tickets will be accepted for refunds or exchanges after a purchase is made.

Copies of the schedule, including a listing of the Family Circle seat numbers available for each performance, are now ready for distribution at the Film Service Office.

Schedule
(All evening performances)

September		**January**	
Tue. 21	Boris Godunov	Tue. 18	Pelléas et Mélisande
Fri. 24	Boris Godunov	Fri. 21	Les Contes d'Hoffmann
Sat. 25	La Gioconda	Sat. 22	Adriana Lecouvreur
October		Sat. 29	Les Contes d'Hoffmann
Fri. 8	La Forza del Destino	**February**	
Tue. 12	Der Rosenkavalier	Fri. 4	La Bohème
Fri. 22	La Gioconda	Sat. 12	La Bohème
Sat. 23	Idomeneo	Tue. 15	Les Contes d'Hoffmann
Tue. 26	Un Ballo in Meschera	Tue. 22	Arabella
November		**March**	
Fri. 5	Lucia di Lammermoor	Sat. 12	Don Carlo
Sat. 6	Un Ballo in Meschera	Tue. 15	Don Carlo
Tue. 16	Idomeneo	Fri. 18	Don Carlo
December		Mon. 21	Die Walküre
Sat. 4	Macbeth	Fri. 25	Die Walküre
Tue. 7	Macbeth	Tue. 29	Madam Butterfly
Tue. 14	Parade	**April**	
Fri. 24	Macbeth	Sat. 9	Il Trovatore
Tue. 28	Tannhäuser	Tue. 12	Il Trovatore

Service Awards

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

Thirty-Five Years

Robert J. Allen ..... Plant Eng.
Walter C. Buckes ... Supply & Materiel
Robert Lehn ..... Central Shops
Gerald Strickland .... Energy & Env.
William A. Tuttle ..... Accelerator

Twenty-Five Years

Leo J. Casey ..... P.&G. Arts
Paul G. Edwards ..... S.&E. Prot.
George Kuzmack ..... Accelerator
Viola N. McKenzie ..... S.&E. Prot.
Wesley G. Ripperger .. Energy & Env.
Frank J. Thornhill ..... Accelerator

Twenty Years

Morris Beller ..... Energy & Env.
Edward G. Divis ..... Energy & Env.
George Korhut ..... Accelerator
Anthony F. LoMonte ..... Medical
Victoria L. McLane ... Nuclear Energy
James G. Nekerman ..... Plant Eng.
Elaine Rowland ..... Chemistry
Mary A. Simack ..... Physics
Serafin R. Vargas ..... S.&E. Prot.

Ten Years

Alexander F. Pendzick .... Accelerator
Charles V. Robinson ..... S.&E. Prot.
Daniel A. Visconti ..... Physics
Charles F. Vogel ..... Central Shops
David O. Welch ..... Energy & Env.

Cabaret Cast Call

Get your act together! The 5th Annual BERA Vaudeville Show is scheduled for Friday and Saturday nights, September 17 and 18. This popular event offers an opportunity for all interested performers to "show their stuff" to a lively and supportive audience in a cabaret setting at the Brookhaven Center's north room.

All kinds of acts are welcome: comedians, acrobats, jugglers, magicians, singers, dancers, musicians, trained seals, ... Acts should be five minutes or less.

No experience is necessary. Auditions will be held in the north room of the Center, starting at 7:30 p.m., on Tuesday, August 31 and Wednesday, September 8. A piano accompanist will be available on September 8; people who do not require an accompanist are requested to attend the August 31 audition if possible.

For more information, contact the show's organizer Jane Love (286-1136), or the publicity chairman Penny Baggett (Ext. 5154).

BERA Concert Series

The Tokyo String Quartet will lead off the 32nd season of the BERA Concert Series with another exciting performance on September 16. To enable you to make your concert-going plans, following is a listing of the artists who will appear at Berkner Hall during the 1982-83 season. Program details will be published in the Bulletin prior to each concert. All performances begin at 8:30 p.m.

Thursday, September 16.	**The Tokyo String Quartet** (This will be the Quartet's third appearance at BNL)
Monday, October 18	**Quartetto Beethoven Di Roma** (The quartet was formed by former soloists of the celebrated I Musici during the Beethoven Bicentennial in 1970.)
Wednesday, January 19	**The Folger Consort** (An ensemble of early music specialists in residence at the Folger Shakespeare Library in Washington, D. C.)
Thursday, March 17	**The Music Project** (A mixed chamber group of young musicians who play a variety of chamber pieces that sometimes require unusual combinations of instruments)
Tuesday, April 12	**Minoru Nojima, Pianist** (Since his prize-winning performance at the 1969 Van Cliburn Competition, he has performed with distinction throughout the U. S., the Far East and Europe.)

Series Subscription

A subscription to all five concerts is priced at $25 and may be purchased at the door the night of the first concert, or in advance from the persons listed below. Please note that only one ticket from a subscription series may be used at the Tokyo String Quartet concert.

Single Admission

Adults - $7
Students & Senior Citizens - $4
Under 18 - $3

Ticket Sellers	Ext.	Bldg.
Arnie Aronson, DNE	2606	130
Clemens Auerbach, DNE	2914	197
Howard Gordon, Physics	3740	510
Geoffrey Hind, Biology	3400	463
Richard Holroyd, Chem.	4329	555
Don Lazarus, Accel.	4643	911
Maria Pavlova, Medical	3634	490
Ed Popenoe, Medical	3622	490
Steve Schwartz, DEE	3100	426
Larry Trueman, Physics	3767	510

Conjunto Flamenco

From Spain to Santa Fe, the critics agree that Maria Benitez is one of the world's great Spanish dancers. Here's what some critics have written about her:

"...without a doubt the finest prima ballerina assoluta of the Flamenco dance." (El Diario-La Prensa)

"...dances with everything that she is and produces pure poetry in the process." (Santa Fe Reporter)

Tickets are still available to the performance of the Maria Benitez Estampa Flamenca Spanish Dance Company scheduled for Thursday, September 9 at 8:30 p.m. in Berkner Hall. The Company will dance a variety of all aspects of Spanish dance to the music of guitarist Pedro Cortes.

Tickets, at $6 each, can be purchased from Gail Williams, Bldg. 460, Ext. 3338, or at the BERA Sales Office. Checks should be made payable to BERA. Tickets will not be sold at the door.

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In Appreciation

In a recent letter regarding the dedication of a plaque to him at BNL on his 94th birthday, Irving Berlin wrote "I can't tell you how much this means to me. Camp Upton was a very important part of my life and having this plaque placed on the grounds of Brookhaven touches me deeply. With my best wishes and thanks to you and everyone for this great honor, I am, sincerely, Irving Berlin."

Arrivals & Departures

Arrivals

Frank Amendola ..... Medical
Willie H. Campbell ..... Supply & Mat.
Arnold Levin ..... Energy & Env.
Tex L. Horning ..... Energy & Env.
Tonyia R. Samuel ..... Medical
John R. Savoy ..... Reactor

Departures

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

Donald E. Clark ..... Nuclear Energy
Michael T. Collins ..... Physics
Anthony Gangemella ..... Physics
Angela Garcia ..... Contr. & Proc.
Edgar E. Gooch, III ..... Chemistry
Bettie J. Hicks ..... Medical
Juris E. Kaugerts ..... Accelerator
Michael G. Luban ..... Energy & Env.
Nabil A. Morcos ..... Nuclear Energy
Philip K. Williams ..... Director's Ofc.

Harvesting Hints

There's no question about when a tomato is ripe for the picking, but other vegetables may not be as obvious about their maturity. Here are some guidelines for picking the bounty from your garden:

- Snap beans — Harvest 2-3 weeks after flowering, when pod shows only slight bulges from the developing seed inside. Keep picked to prolong harvest and to prevent beans from becoming tough and seedy.
- Beets — Pull when they are 1½-2" across. Older beets get woody, tend to crack.
- Broccoli — Pick before the dark green blossom cluster opens into yellow flowers.
- Brussels sprouts — Harvest when firm, compact, bright green.
- Cabbage — Heads should be firm, feel heavy for their size. If left on the plant too long, they will split open.
- Cauliflower — Harvest when heads reach a diameter of about 6". Yellowing indicates the heads are too mature or were not blanched properly.
- Cucumbers — Pick when still dark green and firm; letting them mature on the vine will reduce or halt production.
- Onions — For fresh eating, harvest almost any time. For storage, leave in the ground until the tops have fallen over and turned brown.
- Summer squash — Pick when small, 6-8" long, then skin. As they get older and larger, they become tough and the seeds get woody.
- Winter squash — Harvest after cool weather begins; this will increase sugar content and storage life. Should be tough skinned (not easily punctured by a thumbnail) and of good color.

Swimming Pool

Summer season tickets are valid through Sunday, September 5. During the week of August 30 through September 5, only the pool will be open as follows:

Monday through Friday
(Employees only)
11 a.m. to 1:30 p.m.
(Employees/Families/Guests)
1:30 p.m. to 9:30 p.m.
Saturday and Sunday
(Employees/Families/Guests)
1 p.m. to 6 p.m.

The pool will be closed on Monday, **September 6** (Lab holiday).

New Season

Tickets for a new pool season, valid September 7 through December 22, will be sold at the pool starting on opening day.

Fees:

Season Tickets (fees not prorated)	
Individual Membership	$23.00
Family Membership	33.00
Daily Admissions	
Employee/Family Member	1.25
Guest	1.75

Schedule
Monday through Friday
(Employees only)
11 a.m. to 1:30 p.m.
(Employees/Families/Guests)
5 p.m. to 9:30 p.m.
Saturday and Sunday
Employees/Families/Guests
1 p.m. to 6 p.m.

Guest Ruling (Applies to all recreation facilities)

One Guest - An employee is allowed to bring one guest per visit without special permission or prior arrangement. The guest must be accompanied by the employee.

Two to Five Guests - Advance arrangement for two to five guests may be made at the Recreation Office. (No more than five guests per employee is ever permitted.) When such an arrangement is made, the Recreation Office issues an admission card stating the sponsor's name and life number, the number of guests permitted, the date of visit, and the facility to be visited. Guests must be accompanied by the employee, who will be requested to show the admission card at the main gate and at the swimming pool ticket desk.

Sponsoring employees are responsible for their guests during the entire time they are on site.

Football

The BNL Touch Football League Committee announces that play will begin early in September and extend to the end of October. Games will be played at the BERA Recreation Park on Monday and Thursday evenings at 5:20.

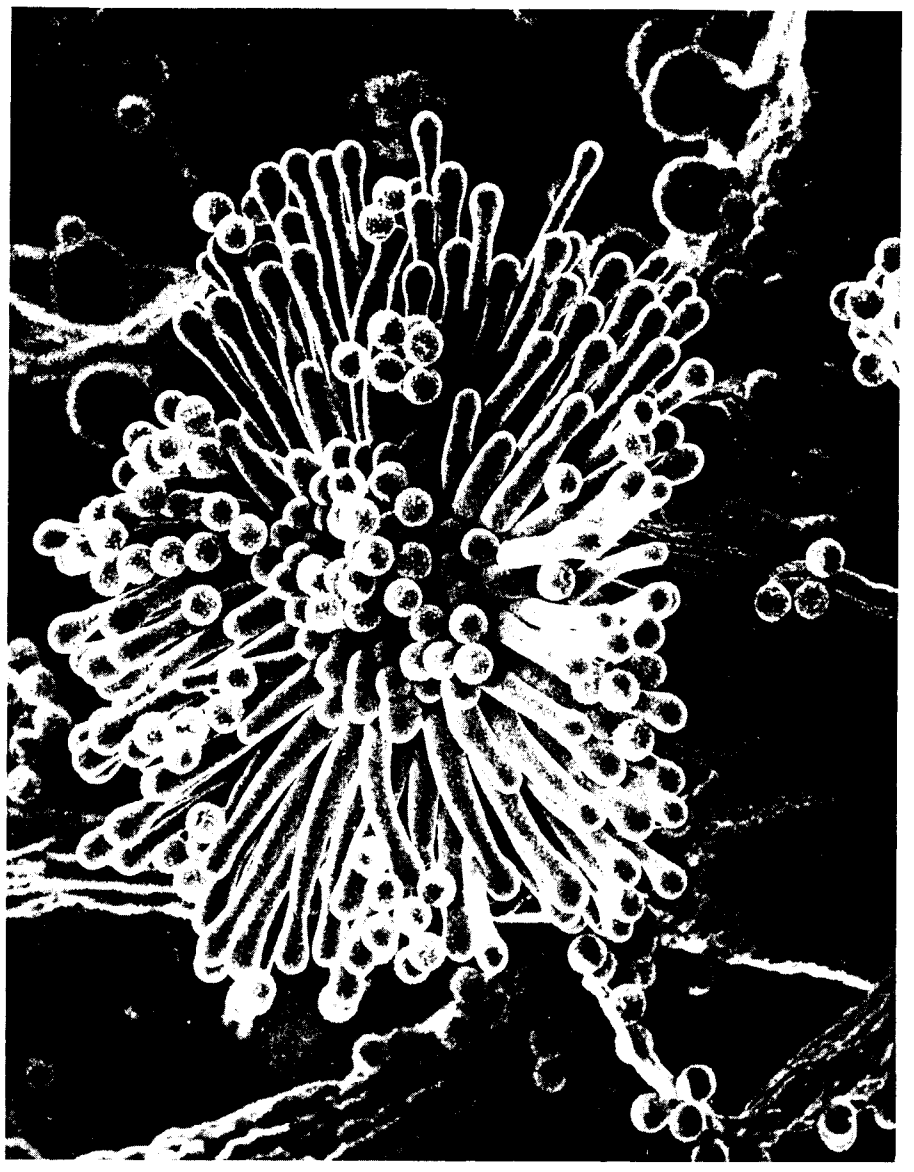
All teams interested may pick up entry blanks and game rules at the BERA Sales Office any weekday between 9 a.m. and 1 p.m. New teams will be welcome. A Players' Pool will accommodate those individuals who would like to play but are not included on an organized team's roster. Since no blocking and limited body contact are part of game rules, players of all ages can take part with little fear of being injured.

Contact Ed Taylor, League Chairman, on Ext. 7589 for further information.

CREF Values

June	51.94	July	51.19
August	48.26	September	45.89
October	47.61	November	49.61
December	48.33	January	47.49
February	44.88	March	44.48
April	46.32	May	44.53
June	43.34		

July $42.41



Pretty, isn't it? Pretty deceptive, that is! This artistic array of shapes is really a 390× magnification of *ambrosia artemisiifolia* — more commonly known as ragweed. The pollen (round particles with spines) and stigma shown here were fresh-frozen for this photograph, taken by a scanning electron microscope in Biology, using a technique developed by Myron Ledbetter. The troublesome allergens that are plaguing so many people right now are found in the walls of the pollen. If it's any comfort, their purpose is *not* to cause an allergic reaction. Their real raison d'etre is to stimulate the growth of sperm-containing pollen tubes. When water-soluble allergens land on a "female" part of a flower, they may release their stimulating proteins within a few seconds. Unfortunately, the same reaction can occur when these allergens come into contact with human mucosa. Then, the proteins stimulate aggravation rather than pollination.

Adult Swim Lessons

A course of swimming lessons, open to on-site employees and their adult dependents, will begin on Wednesday, September 22. The course will consist of one lesson per week for eight consecutive Wednesdays at 5:15.

Registrations are now being accepted at the pool during open hours. A fee of $15 (checks made out to BERA) will be payable at the time of registration.

Lessons will be cancelled if a minimum of ten registrations is not realized by Wednesday, September 15.

Softball

Leagues I and II
Six Pax vs. Roga
Moles vs. Ravens
Phoubars vs. Ice Pops
Games rained out
Blue Jays (won) — Big Sticks (lost)
Leagues III and IV
Titans vs. Medical — game rained out
Electric Co. 14 — Magnuts 9
Walter Annand, Peter Eterno and Jim Boomer were 3 for 4.
AMD 22 — Random Errors 7
Dirty Sox 10 — Lights Out 9
League V
Double-header:
TNT 6 — No Names 5
TNT 11 — No Names 5
Nads 11 — E-Z Riders 8
Survivors 13 — Turkeys 6
Makeup game:
No Names (won) — E-Z Riders (lost)
League VI
No Feedback (win) — Who's On First (forfeit)
The Source 7 — Mudville Sluggers 5
Who Cares 15 — Underalls 11
Mole-Esters 9 — Random Sample 7
Three-run home run by Dave Alexoff.

Cafeteria Menu

Week Ending Sept. 3, 1982

Monday, Aug. 30		
Cream of mushroom soup	(cup)	.65
	(bowl)	.75
Ham & potato au gratin		1.85
Broiled chicken livers & 1 veg.		1.80
Hot Deli: Meatball hero		1.90
Tuesday, Aug. 31		
Lentil soup	(cup)	.60
	(bowl)	.70
Roast turkey w/stuffing & giblet gravy		1.90
Corned beef & cabbage		1.90
Hot Deli: French toasted ham & cheese		1.75
Wednesday, Sept. 1		
Beef noodle soup	(cup)	.60
	(bowl)	.70
Labor Day Special		
Roast top round of beef "sliced to order" w/baked potato & cauliflower au gratin		2.14
Baked ziti w/meat sauce & fresh broccoli		1.85
Hot Deli: Pastrami sandwich	(bread)	1.85
	(roll)	1.95
Thursday, Sept. 2		
Split pea soup	(cup)	.60
	(bowl)	.70
Old fashioned beef stew on egg noodles		1.95
Sauted chicken breast on white rice		1.90
Hot Deli: Roast turkey breast	(bread)	1.85
	(roll)	1.95
Friday, Sept. 3		
Fish chowder	(cup)	.65
	(bowl)	.75
Beef hash & 1 veg		1.80
Breaded fish fillet & 1 veg.		1.85
Hot Deli: Clam boat		1.90

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Salad Bar — Tuesday, Wednesday & Thursday 11:30 a.m. — 12:30 p.m.

Classified Advertisements

Placement Notices

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

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

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

1739. SECRETARIAL POSITION - Requires significant experience working in a diversified office setting. Will be responsible for providing secretarial support for staff members of various groups within Personnel. Excellent clerical, organizational and interpersonal skills are essential. Personnel Division.

1740. RESEARCH ENGINEER - Requires BS in chemistry. Individual will provide support in the area of energy technology including catalysis for synthesis gas conversion, coal cleaning and coal slurry fuel preparation. Department of Energy & Environment.

1741. MEDICAL ASSOCIATE - Requires BS in biology/chemistry. Individual should have a knowledge of basic radiation physics, physiology and bio-chemistry. Ability to work with human subjects is essential. Medical Department.

1742. MEDICAL ASSOCIATE - Requires BS in biology/chemistry. Individual should have a knowledge of clinical hematology, immunological techniques and cell culture. Medical Department.

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

1743. TECHNICAL RECRUITER - Requires a bachelor's degree (preferably in a technical discipline) and pertinent professional experience working with affirmative action principles, plans and programs. Responsibilities will include recruitment for special affirmative action development activities, including our college co-op engineering program as well as for regular, scientific-professional, engineering and technical positions. Personnel Division.

1744. COMPENSATION ANALYST - Requires bachelor's degree in business adminstration or a related field and two years' pertinent professional experience. Will be responsible for conducting job evaluations and salary surveys, writing job descriptions and developing a salary administration program manual. The successful candidate must possess excellent demonstrated analytical and communications skills, both oral and written. Personnel Division.

Autos & Auto Supplies

80 MAZDA SPORT PICKUP - immaculate, stereo w/tape, 22,000 mi., 26 mpg local, 40 mpg hywy., $5,100. 727-7741.

79 HONDA HAWK - motorcycle, 400cc, excel. cond., low mi., $995. 588-0805 eves.

CAR STEREO - am/fm w/2 speakers, $65; Jeep soft-top boot, still in pkg., $20; Jeep tire w/rim, $15. Toni, Ext. 2907.

56 FORD - F-100 truck & parts; 1974 Camaro parts; 1968 GTO body parts; must sell, cheap. Don or Fred Paffrath, 499-1214.

80 PONTIAC - Sunbird, brown, 6 cyl., auto, a/c, am/fm, bucket seats, pwr. steering/brakes, good mpg, excel. cond., $5,000. 744-0742 after 6:30 p.m.

76 AMC PACER - a/c, p/s, good cond., 80,000, $1,500. Kim, Ext. 7679 or 929-3470.

75 CADILLAC - Coup DeVille, 2 dr., blue/white vinyl top, 45,000 orig. mi., new tires, mint cond., $3,000. 289-9368.

63 FORD - F500, 12 ft. basket truck, call for appt. Ext. 4835 or 473-3974.

76 HONDA - Civic CVCC, am/fm stereo, fog lamps, 36+ hywy., 29 city, very clean in & out, dependable, $2,000. 941-4127 eves.

81 CHEVY - Chevette, asking $5,000. 293-7368 after 8 p.m.

HITCH - Class II, for 1978 & newer mid-size GM cars, no drilling required, $60. Ext. 4121.

77 TOYOTA - Corolla, 2 dr., 1200cc eng., 5 sp., 73,000 mi., $2,000. 473-4441.

ROOF RACK - for compact cars, attaches to rain gutter, does not mar roof, $25. Ext. 2799.

SPORT RIMS - Rally, (4) 14", good cond., $20 ea. Joe, Ext. 2022.

74 TORINO - hi-mi., good body, good for parts, $450 negotiable. Ken, Ext. 2350.

75 AMC PACER - 6 cyl., fm-8 trk., new tires, p/s, a/t, mechanically sound, clean, $1,300. 586-2174 until 9 p.m.

80 CHEVETTE - 4 dr/HB, gray/red inter., am/fm, a/t, a/c, 22K mi., excel., $4,850. 286-8119.

81 CAPRI GS - 20,000 mi., a/t, 4 cyl., sunroof, am/fm-8 trk., excel. cond. & mpg, $6,800 negotiable. Ken, Ext. 2350.

78 HONDA - 550K, 4 cyl., good cond., asking $1,200. Danny, 331-1411 after 6 p.m.

78 HONDA - CB550K, black, 4 cyl., excel. cond., 4,600 mi., $1,400. Rich, Ext. 4662.

67 TRIUMPH - Tiger, stock, excel. cond., new top end & pipes, must sell, $750. Ext. 5385 or 654-2076.

80 FIAT - Strada, excel. cond., am/fm stereo, new radials, Rusty Jones undercoating, $3,850. Ext. 2231 or 369-1829.

80 KAWASAKI - KL250, good cond., asking $750. Ken, 924-4398 after 6 p.m.

79 HOND - CM400T, 2,000 mi., garaged, must sell, $1,000. 981-0181.

71 DODGE DART - high mi., reliable runner, $300. Newcombe, Ext. 2864 or 929-3150.

75 BUICK STATION WAGON - very good cond., runs smoothly, air cond., best offer, leaving soon. Ext. 4881.

TIRE - Goodrich Lifesaver, steel belted radial, GR78-15, new, $50, mounted on new Ford rim, $65. Ext. 4482.

78 PLYMOUTH - Horixon Deluxe, 4 dr., a/t, a/c, p/s, p/b, am/fm, all new brakes, new S/B radials, roof rack, CB-side band, red, 55K mi., $3,295. Ext. 4028 or 654-5888.

76 PLYMOUTH 360 ENGINE - & transmission, still on car, take all for $250. 698-6585 or 924-0960.

72 CHEVY - good transportation, good cond., reg. gas, clean. Dom, Ext. 4851 or 732-6995.

73 OLDS CUTLASS SUPREME - a/c, a/t, p/b, p/s, good running, 120K. Joseph, Ext. 4789 or 878-1426.

69 FORD CORTINA - good for parts, body fair. 286-0638 after 5:30.

79 MGB - convertible, 31,000 mi., 2 tops & hood cover, new tires, am/fm stereo, excel. cond. 878-0516.

79 HONDA - mini dirt bike, model Z50R, 50cc, excel. cond., hardly used, $325. Ext. 3604 or 878-0516.

75 TOYOTA PICKUP - 59,000 mi., rebuilt 77 eng., 6' bed, needs muffler, good cond., $1,700. 286-0263 eves & weekends.

ALUMINUM MAGS - (4), 7"x15" Ford with lugs and locks, $80 set; rims (2) pairs, 14" & 15" Ford, $ per pr. 878-9534.

77 KAWASKAI - 650cc, very good running, Kerker exhaust, elec. ignition, new tires, green, asking $1,200. 289-5744.

CHEVY TRANSMISSION - 4 spd., clutch & Bell housing assy., asking $100. Artie, Ext. 2674 or 325-0743.

DUNEBUGGY - many new parts, new paint, real sharp, best offer. Ext. 5385 or 744-0290.

71 CHEVELLE - Hugar orange, white stripes, new engine, body excel., needs some work. Ed, Ext. 2674.

77 MOPED - Batavus, excel. cond., only 600 mi., 160 mpg. $275. 924-6835.

Boats & Marine Supplies

12' SAILBOAT - Lockley Sea Witch, used one season, with main and jib, $900. 588-1671.

KAYAK - paddle & airbags, $180. Ext. 2521 or 928-8379.

16' SILVERLINE - Deep V, 1979, 55 hp Johnson, low hrs, $1,700. Kevin, 567-6651.

13' SAILBOAT - fiberglass, with main and jib, good cond., $500. Ext. 4482 or 277-1129.

20' SAILING DORY - sprit-rigged wooden classic, Dacron sails, trailer, 3 hp o/b, in water. Ext. 3778 or 689-8685.

18' GARVEY - and 40 hp outboard, needs minor work, $749. John, Ext. 3292 or 286-1348.

18' CANOE - Grumman Sportsman, square stern, $325. 399-2312.

Yard Sales

YARD SALE - Sept. 2-4, 10-4. 198 Carman St., Patch., guitar, $50; maple dinette, $50. 289-8212.

MOVING SALE - furniture, toys, etc., Longview Rd., Wading River, Sat. Aug. 28. J. Kaugerts, 929-4923.

BARN SALE - Aug. 27 & 28, Pipe Stave Hollow Rd. N., Miller Place. Look for signs. Lots of interesting things.

Free

REFRIGERATOR - & top freezer, good beer & soda refrigerator for basement, Philco, you take. Sue, Ext. 3675.

KITTENS - can you save a kitten by giving it a good home? Ext. 2980 or 289-0532.

Miscellaneous

COAL STOVE - Haas & Sohn 121.12, 38,000 BTU, used 3 wks., sells for $725, asking $625; speakers, Avid 105, 3-way acoustic suspension w/2 side firing tweeter, list $750/pr., asking $550. Al, Ext. 2072.

CONSOLE - mahagony, large, good, $25; (2) 55 gal. drums, $7 ea. Dan, Ext. 3631.

CHROME TABLE - air conditioner, dehumidifier, fixtures, flexing exerciser. Ed, 585-2088 after 4 p.m.

LADY'S BIKE - Raleigh, 3-sp., Sturmey Archer shift, excel. cond., less than 1/2 price, $95 firm. 727-3608.

COLOR TV - $100; stereo record player, $50; electric mixer, other assorted items. Evelyn, Ext. 3395 or 282-3231.

EXERCISE BIKE - like new, w/odometer & tension knob, asking $75; tummy trimmer, $10. Gina, Ext. 3646 or 727-3167 eves.

CEMENT MIXER - 2-1/2 cu. ft. capacity w/1/4 hp elec. motor, like new, $200. Joe, Ext. 2575.

FISH TANK - 20 gal., complete starter set, incl. pump, filter, cover w/light, extras, $50. Chuck, Ext. 4483 or 567-1272 eves.

CAMERA - Vivitar 35EE, practically new, $50. Janet, Ext. 2345 or 929-8152.

SLIDE PROJECTOR SYSTEM - Airquipt, remote (needs bulb), screen, (16) 100 slide reels. Jack, Ext. 4411 or 929-8287.

ATTIC FAN - 46" w/motor, $100. Paul, Ext. 4665 or 727-4859.

LENS' - Vivitar 28mm F2.8, $50; Sun 80-240 Macro, $135; Soligor 35-105mm Macro, $125; all Nikon mounts. 929-4326.

HUNTING BOW - Bear Kodiak, left hand, excel. cond., incl. arrow quiver, $50; G.E. stereo receiver, BSR turntable, no speakers, walnut finish, very good, $140 or best offer. B. Mele, Ext. 2514 or 757-3178.

CURTAINS - Cape Cod, white, 4 pr., 45"; red calico, 4 pr., 45" w/bed spread; used one season, $30. 286-0259.

LADIES BIKE - Schwinn, 26", $20; men's Roadmaster bike, 26", $100; Skil elec. edger & trimmer, $25. J. Candiano, Ext. 4144.

CASSETTE TAPES - blank, BASF PRO II, CrO^2, C-90, $2.75/ea. Ext. 2521 or 928-8379 eves.

BASKETBALL GOAL - regulation size, w/hoop & braces, $25. Ext. 2733 or

878-8491 after 6 p.m.

FREEZER - GE, 19.3 cu. ft., upright, 6 mos. old, used only 1-1/2 mos., sacrificing for $440 or better offer, Ext. 3060.

KEROSENE HEATERS - (2); leather jacket, size 10; 4 prs. of pants, never worn, made in France, size 10. Chris, Ext. 2907.

KITCHEN/PATIO SET - wrought iron, 4 chairs, lucite top, excel. cond., $175; (2) black naugahyde love seats, plus recliner to match, ideal for den, excel. cond, $300. JU4-6019.

GOLD LAVOBO - excel. cond, $15; ironstone flower arrangement, natural & silk, $10; paintings, lamps. 589-5126.

STRING ART KIT - 3-D, large ship, never used, cost $40, sell for $15. Irene, 589-5126.

POOL - Coleco, 15x30, steel wall w/all equip., good cond., new pool cover, must see. 281-8118.

LOVESEAT - Duncan Phyfe, velvet; English velvet sectional. 727-0933.

ORGAN - Yamaha D-80, 48 key manuals, solo synthesizer, percussion, Leslie, sustain, reverb, accomp. hythm, $2,500. George, Ext. 7748.

TICKETS - (2) for Met. Opera, Sept. 29, der Rosenkavalier, rear orchestra, $27.50 ea. Tony, Ext. 4024.

MATTRESS - & box spring, twin size, $45. 475-4394.

STEREO CASSETTE DECK - Sony TC186 SD; amplifier, 25W channel; speakers, excel. cond. Saha, Ext. 4339 or 924-6139.

GOLD RETRIEVER PUPS - male & female, champion sire, gorgeous, AKC shots, reasonable. 281-0629 eves.

SWIMMING POOL - 24 ft., 1 mo. old, w/10x15 deck, excel. cond. Ext. 3679 or 744-3315.

TYPEWRITER TABLE - like new; Bell & Howell 8 mm projector w/auto. load, excel. cond. Al Campbell, Ext. 3354.

ATARI CARTRIDGES - assorted, in orig. boxes, $10 to $18. Ext. 4213 or 734-7342 after 6 p.m.

NUTS & DRIED FRUIT - at wholesale prices, free delivery to BNL. 727-4859.

LAWNMOWER - 18" reel, manual, $40; lawn gage, eik, beach, 15 spreader, 24", $20; electric hedge trimmer, 16", $10. J. Olsor, 289-8627 after 7 p.m.

CHANDELIERS - several, beautiful crystal, and others; Danish modern dresser or buffet, 5'x18"x36", walnut, $85. Jake, Ext. 4532.

BRONZE PROPELLER - Michigan, 10x12, $20; Spencer scientific microscope, 3 objectives, 2 eyepieces, substage cond., $350. Ext. 4058 or 286-0436.

AIR CONDITIONER - Welbilt, 6400 BTU, large window or wall unit, $55. Ext. 4051 or 286-0436.

ROTOTILLER - 36" wide, for yard tractor, never used, was $350, asking $200; rotary spreader, 1/2 bu. with PTO shaft for tractor use, used 2 hrs., $50; Wright 19" reciprocating saw, very good cond., needs carb. adj., orig. $319, asking $75. 929-4522 after 5 p.m.

COLLECTOR DISHES - B&G and Royal Copenhagen Christmas editions. 286-0422 eves.

WASHER & DRYER - Kenmore portable, good working cond., dryer hardly used, $250; baby crib, excel. cond., with mattress, $40. Krishna, Ext. 4025.

DOUBLE OVEN - & range top, G.E., sensi-temp. burner, pink, everything works, $75. Sue, Ext. 3675.

ELECTRIC TYPEWRITER - Smith Corona, portable, dust cover, case, $100. Newcombe, Ext. 2864 or 929-3150.

ELECTRIC DRYER - Frigidaire, large capacity, free delivery, $100. Ext. 3913 or 475-8099.

GM CAR SEAT - infant, $10; Presto hot air corn popper, used once, $20; baby stroller, little rust, $10; Salton 6 cup yogurt maker, hardly used, $10. 924-6835.

LADY'S BIKE - Ross, new 10-speed, with rack & generator, $190. Ext. 3890.

QUARTZ HEATER - new, very reasonable, personal heating, excel. for saving energy. Miriam, Ext. 4881.

BLACK & WHITE TV - Admiral, plus stand, works well, $15; 3-speed 16" oscillator fan, brand new, cost $34, will sell for $25. Ext. 3798 or 3111.

BATHTUB - authentic ball & claw, mf'd. Oct. 18, 1914, needs refinishing, $200. 286-2265 after 7 p.m.

ATARI GAME - with cartridges. Adventure, Pac Man, Asteroids, Skiing, Air & Sea Battle, Grand Prix, etc., excel. buy, complete pkg. for $260. Ext. 3604 or 878-0516.

LAWN MOWER - Scarlo commercial, 5 hp, heavy duty, used 3 times, $200. Dick, Ext. 3499 or 589-9103.

REFRIGERATOR - Frigidaire, good, $150; portable washer & dryer, Sears Best, 4 yrs., $150 ea. Jeff, Ext. 3296 or 286-8099.

STEREO AMPLIFIER - Bogen, excel. cond., like new, 35 watts per channel, $60; upright organ, Magnus, model #535, 42 watts, $60; Siltronix 0-1500 watt meter, 2-50 MHZ, $50. 751-6418.

DINING SET - chrome, table oval, white formica, 4 chairs, white upholstery, protective plastic cover, 1 yr. old, excel. cond., orig. $650, asking $200. Ext. 3589.

Real Estate

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

For Sale

YAPHANK - 3 bdrm. ranch, full bsmt., 2 lrg. rms. on back 1/2 acre, oil hot water heater, ($13,700 7-1/2% assum. mort.). $41,700. 924-6895.

MEDFORD - condo, Birchwood at Blue Ridge, 15 min. from Lab, 3 bdrms., many extras, facing golf course, $50's. 698-7213.

OLD STONY BROOK NORTH - 100 yrds. to beach, energy efficient, totally restored, 2-3 bdrms., 1-1/2 baths, bsmt., brick patio, 2 car garage, fence, $1,100 taxes, $86,900. Ext. 2145.

MASTIC BEACH - 4 bdrm. cape, large l/r, d/r, eik, util. room, gas hot water & cooking, full porch, low taxes, near stores & bay, Farmer's 8-1/2% mortgage, 80x100 prop., (adjacent 80x100 avail., reasonable), $24,000. 281-0360 after 6 p.m.

WADING RIVER - custom built 4 bdrm. colonial, 2 baths, d/r, den, f/p, 2 car garage, full basement, private beach. Ext. 7727 or 929-4631.

For Rent

SHIRLEY - furnished 1 bdrm. apt., walk to beach, laundry facilities, working individuals only, $400/mo., all util. incl. 399-0327 days & weekends.

MASTIC BEACH - furn. 3 bdrm. ranch, lovely location near bay, well insulated, prefer Sept.-June, will consider longer term, $450 + util. Ext. 3761 or 399-3609.

Lost & Found

LOST - motorcycle helmet, candy apple red, extra large, lost from on top of my bike. Jack, Ext. 4411.

Car Pools

ELWOOD - E. Northport area, one driver needed for 5 man pool. Fred, Ext. 4407.

LAUREL/MATTITUCK - Carmen, Ext. 2663 or 298-4931 after 6 p.m.

N. PATCHOGUE - would like to join car pool, near Brookhaven Hospital, driver or rider. Ext. 3954.

E. ISLIP - 3 man pool desires other riders/drivers. Jake, Ext. 4532.

SOUTH PATCHOGUE - on time car pool in operation 10 yrs., opening for 1 paying rider now, add'l. in Oct. Alyce, Ext. 2902.

BELLPORT - existing 3 person car pool looking for new members. George, Ext. 7654.

Wanted

UTILITY TRAILER - home made, with 4' wide bed, will spend approx. $100. 924-6751 eves.

TIRES - C78-13, good to fair cond. Susan. Ext. 4267.

MOTORCYCLES - bent or broken, any age or condition. Kevin, 281-8031.

EXERCISE BIKE - good cond., moderately priced. Jake, Ext. 4532.

OLD COMFORTERS - blankets or remnants for animal shelter. Lois, Ext. 2959 or 751-0023.

WOMEN'S BIKE - 24", single speed, good cond. Dan, Ext. 3867 or 698-6120.

FRONT NOSE - for 1969 Pontiac Firebird, in good cond. Sue, Ext. 3709.

GRE STUDY BOOK - to buy or trade for GMAT study book. Paige, Ext. 3263.

HOUSE - &/or housemate for winter rental, starting Sept./Oct., commuting distance to Lab. Paige, Ext. 3263.

MOTORCYCLE - bumper carrier. Ext. 3926.

ENCYCLOPEDIA - World Book, mid 60's or later; bookcases, filing cabinet. 751-4522.

BABYSITTER - live-in or out, free room & board plus small salary. 981-4626 eves & weekends.

BOOKCASES - (2 or 3), and desks (2), youth size. Hovi, Ext. 2923 or Ext. 3102 anytime.

CAR SEAT - for baby, reasonable price, good cond. John, Ext. 3292 or 286-1348.

BELGIAN BLOCKS - any amount, will pick up, must be reasonable. Dick, Ext. 3499 or 589-9103.

CAR SEAT - for young child, prefer GM toddler. Artie, Ext. 2697 or 325-0743.

ENGINE DOOR - for 1973 Super Beetle. If you called last wk., please call again, lost your extensions. Toni, Ext. 2907.

Services

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

PAINTING - wall papering, panelling, carpentry, free estimates. John, 924-5012.

LEARN GERMAN - Barbara, Ext. 3018.

CARPETS INSTALLED - repaired, quick, dependable service, free estimates. Jim, 821-0187 after 5 p.m.

GENERAL CONTRACTOR - carpenter, extensions, dormers, garages, conversions, basements, decks, kitchens, licensed. Jim, 698-2501.

CLEANING SERVICE - office, home, apt., work by owners, free estimates, references. Ray, 732-4885 eves.

FIRESIDE CHIMNEY SWEEPS - pre-season special thru Sept. 15, fireplaces, wood, coal & oil flues, fully insured. Bill, 584-6425.

SECRETARIAL SERVICES - business and personal correspondence, forms, manuscripts, telephone dictation, fast service. Colette, 744-2816.

SPACKLING - & sheetrocking, free estimates. Kevin, 567-6651.

LIMO SERVICE - luxury chauffered, airport $60 ur to 6 persons, proms, weddings, evenings out. Ro. Ext. 4664 or 744-8779.

CHILD CARE - in my home, full/part time, 10 min. from Lab, any age. 929-8331.

INSTALLER - car stereos, trouble shoot, free estimate. Lou, 698-6585 or 924-0960.

CHILD CARE - my home in Bellport, lots of TLC, any age, infants welcome. 286-2435.

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

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