BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Peter Horton

The organizers of the Seminar on Wetting and Growth: (from left) Michael Schick, University of Washington; Jean Suzanne, Université d'Aix-Marseille; Gregory Dash, University of Washington; and Laurence Passell, BNL.

A Visitor's View

Gregory Dash Condensed Matter Physicist

An ever-growing community of condensed matter physicists, physical chemists and engineers are interested in the subject of wetting and growth. Gregory Dash is an important member of that community and a leader in the field.

A professor at the University of Washington in Seattle, Dash was also one of the organizers of the "Seminar on Wetting and Growth" held in Berkner Hall, October 2-4. Wetting and growth are related phenomena that deal with the nature of thin films on foreign surfaces and the way in which they grow as more material is added. "Wetting" is a term used by specialists to describe thin films of simple molecules, such as noble gases adsorbed on clean substrates, while "crystal growth" is the usual description for films such as metals on semiconductor surfaces. Both involve similar fundamental mechanisms, and the seminar brought together active researchers from each branch. Said Dash, "This is an old field in the production of metallic crystals and films, and a very new field to those working in adsorption."

Adsorption takes place when an extremely thin layer of molecules contacts and adheres to a surface. If layer after layer of molecules adhere to the surface, complete wetting has occurred. But in circumstances where molecules are not absorbed, such as when water beads on a newly waxed car, non-wetting has taken place. If molecules cease to be adsorbed after a few layers have adhered to the surface, that is called incomplete wetting.

Understanding adsorption, growth and the various kinds of wetting has importance for such practical applications as the production of microcircuits, and to processes that include lubrication and fracture, adhesion and the formation of anti-corrosion coatings. Last week, the 45 seminar attendees focused primarily on the fundamental aspects of the problem.

Dash has been involved with surface science research throughout his career, and, in the last ten years, he has become a leader in the field of wetting and growth. For instance, in 1977, he introduced a classification scheme for describing various types of wetting processes that is widely used in the field today.

After earning his Ph.D. in physics at Columbia University in 1951, Dash began his career at Los Alamos National Laboratory, leaving in 1960 for the University of Washington, where he divides his time between teaching physics and doing research. Though he loves his adopted home of Seattle, Dash has left when special duties and/or far-away research facilities beckoned. In 1974, he became the Louis Susman visiting professor at the Israeli Institute of Technology. From 1977-78 he was an exchange professor at the Université d'Aix-Marseille, France. He was a member of the advisory committee to the National Science Foundation (NSF) from 1976-1980, and, in 1979, directed a NATO Advanced Study Institute on adsorption and phase transitions.

Earlier this year, Dash received the Davisson-Germer Prize of the American Physical Society for "his pioneering studies of the structure and thermodynamic properties of two-dimensional matter." Most of Dash's research now deals with such areas as the physics of monolayer films, many-layered films and the evolution of bulk behavior.

A great deal of work on adsorption is currently being done in the U.S. and France. It was fitting then, that the NSF in the U.S. and France's Centre National de la Researche Scientifique should team up to sponsor last week's Seminar on Wetting and Growth, as part of a program of seminars for fostering collaborative research between the U.S. and France. Dash, together with Michael Schick at the University of Washington, organized the American end of things, while Jean Suzanne of the Universite d'Aix-Marseille headed the French effort.

It all came together at BNL, where Physicist Laurence Passell was the local organizer. BNL, which had first hosted a conference on adsorption nine years ago, was again the logical conference choice, said Dash, "because it's on the East Coast, which makes it convenient to Europe. And there's so much active work going on here, with many good facilities for our type of work, such as the HFBR and the NSLS."

For helping the seminar go smoothly, the organizers thanked Marie Grahn and Nancy White of Physics, as well as Staff Services personnel. But despite the fact that the meetings went without a hitch, they confessed to being a little apprehensive about holding a third conference at BNL. Noting that the first meeting in 1976 was heralded by Hurricane Belle and the second in 1985 by the even more devastating Gloria, they said, "We're not sure Long Island could take another seminar!"

Researching the Air Over Rio

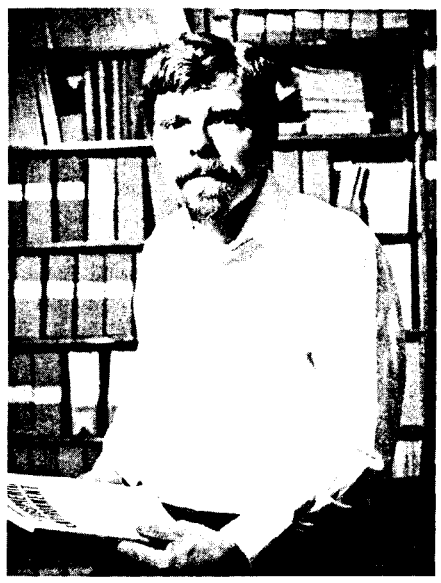
Often, the views from a particular hillside in Rio de Janeiro are a study in contrasts. To the north, barely discernible under a heavy blanket of dirty air, sprawls the industrial hub of that Brazilian city of over five million people and one million automobiles. To the south, on the shores of the south Atlantic Ocean, the spacious campus of Rio's Pontifical Catholic University lies under pristine skies.

Why does this happen? What is the composition of the air in each locale? What is contributing to that composition? These are the kinds of questions Roger Tanner, a chemist in the Environmental Chemistry Division of the Department of Applied Science (DAS) intended to address when he carefully packed his test equipment last June for the 5,000-mile journey to Rio. Over the next three weeks, those instruments collected and measured air samples at two sites in Rio, one in the downtown industrial area, the other by the University.

Tanner's field study grew out of his longstanding association with Antonio Miguel, an associate professor of chemistry at the University. In 1972, when Tanner was a postdoctoral fellow at the University of Illinois and Miguel was a graduate student there, they first worked together on a project in atmospheric chemistry with David Natusch. Though Tanner moved on to BNL and Miguel later returned to his native Brazil, both maintained their common interests and their contact with each other.

As Tanner explained it, rapid industrial development since the 1950's, combined with the apathy of the previous military government, allowed pollution in Brazil's major industrialized regions to go unchecked and unmonitored. Now, however, scientists like Miguel are beginning to assess the damage. And they are doing it with some support from Brazil's new government, as evidenced by the fact that Tanner's visit was primarily paid for by the Brazilian National Research Council.

This was actually Tanner's second association with aerosol studies in Rio. In 1984, he collaborated with Miguel and Joan Daisey of New York University Medical Center to trace sources of aerosols in the city. An aerosol is a gaseous suspension of fine



Roger Tanner

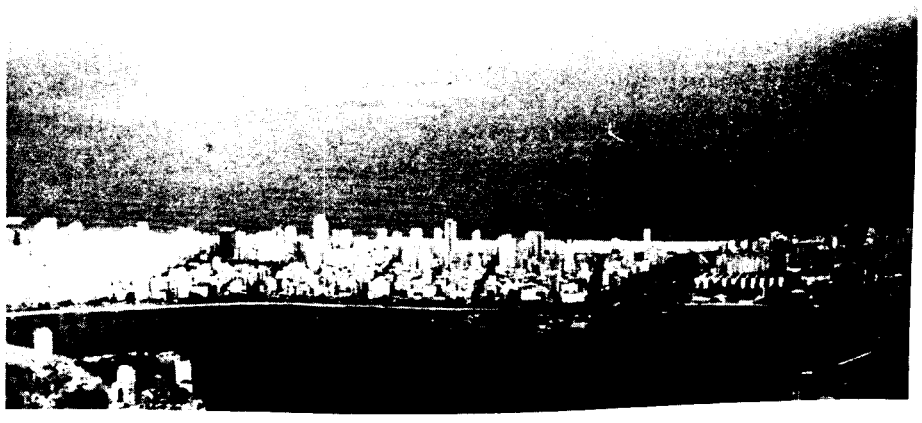
solid or liquid particles. These atmospheric particles contain carbon in each of its atomic variations (isotopes such as ^{12}C and ^{13}C) and radiocarbon (^{14}C). For this first study, aerosol samples from Rio were brought to BNL for measurements of organic and elemental carbon by Mary Phillips. In addition, Joseph Forrest did $^{13}C/^{12}C$ isotopic ratio measurements in a mass spectrometer, which were particularly revealing.

^{13}C is present in biomass associated with both woody (C-3) and grain-type (C-4) plants, though more abundant in C-4 plants. In Brazil, explained Tanner, one of the most prolific crops is sugar cane, a C-4 plant, which can be used to make alcohol fuels. Because the country is rich in sugar cane and poor in petroleum, the thrust has been to convert its automobiles to alcohol power. Today, about 6% of the total fuel consumed in Rio is alcohol-based, and the proportion is increasing. This may have started to show up in Rio's air samples. "Already," said Tanner, "our mass spectrometer shows that carbon-13 is marginally more abundant than what you would expect from fossil fuels and C-3 plants."

How can they determine the extent to which "contemporary" carbon found in newly prepared alcohol fuels is to blame, rather than the "old" carbon in fossil fuels? A miniature proportional counter to measure ^{14}C, developed by BNL chemists Garman

(Continued on page 2)

The view of industrial Rio de Janeiro (top) is often clouded by pollution. But when Roger Tanner turned 180 degrees to take a second photo, he found the air clear over Ipanema, just east of the Pontifical Catholic University.



Air Over Rio (Cont'd)

Harbottle and Raymond Stoenner for dating purposes, was also able to help Tanner differentiate sources of aerosol carbons.

"From other studies," Tanner said, "we know that, close to emission sources, you tend to get a larger proportion of aerosol carbon in the form of soot. The 1984 results, including ^{14}C measured with the proportional counter, confirmed that, clearly, the aerosol levels [haze] in Rio are strongly affected by local sources of soot, mostly from diesel and other mobile sources."

Of equal significance to the high elemental carbon content in aerosols is the fact that hydrocarbons in fuel combine with oxygen to form gaseous aldehydes — highly reactive organic chemical compounds. The two most abundant of such compounds are acetaldehyde and formaldehyde. In a separate study, Miguel determined that, in moving to alcohol fuels, Rio was getting combustion products containing about 85% acetaldehyde and 15% formaldehyde, a far larger proportion of the former than found from gasoline fuels.

The problem here is that acetaldehyde is a precursor to another substance — peroxyacetylnitrate — commonly called PAN. In animals, PAN is an eye irritant and affects the bronchial tract; in plants, it is a phytotoxicant, reacting with waxy surfaces to destroy leaves. "At levels greater than ten parts per billion, it's cause for concern," said Tanner, who has been interested in PAN for some time. He shared that interest with Jeff Gaffney, a former DAS chemist, now at Los Alamos National Laboratory. While at BNL, Gaffney developed an automated gas chromatograph for measuring PAN and related compounds. This was the major piece of equipment Tanner took to Rio in June, and, with it, he made what are believed to be the first surface measurements of PAN compounds in the southern hemisphere.

He also brought a partially automated, high volume sampler, containing the BNL filter pack, to measure nitric acid, as well as sulfur dioxide and aerosols. PAN buildup is directly related to amounts of nitrogen oxides: nitric oxide tends to destroy PAN; nitrogen dioxide contributes to its formation. The amount of nitric oxide and nitrogen dioxide present in the atmosphere depends on the proximity of emission sources and the meteorological dispersion conditions.

As a control, Tanner spent the last few days in Brazil taking measurements at the University site near the coast. "PAN concentrations there were quite low with on-shore winds," he said, "and it will be interesting to compare them to other marine locations."

Previous measurement of PAN concentrations in Los Angeles, California, another emission-rich area with restricted air dispersion, showed peaks in the afternoon, many miles from the source. But the combination of acetaldehydes and nitrogen dioxides yielded different results in industrial Rio. While much data is still being analyzed, Tanner said, "We found several parts per billion concentration of PAN built up in the nitric oxide source area itself. And the buildup was not only significant, but came earlier than in L.A., we think because of the direct emission of acetaldehyde from the alcohol-containing fuel. Acetaldehyde concentrations were found to be about ten times higher than in measurements made at BNL."

Tanner is anticipating the need to do some modeling exercises, to see where measurements should next be taken. "By analogy to L.A.," he said, "we should probably go downwind from Rio, to see if there are dangerously high concentrations of PAN in outlying areas. Our measurements of several parts per billion in the city show that 40 to 50 parts per billion may be there under stagnant conditions."

Whether Tanner will make these measurements himself or, perhaps, serve as a consultant as Brazilian scientists develop their own equipment, is yet to be determined. In the meantime, he said, "We already have two major plusses from our experiments in Rio. We have gathered further information on carbonaceous aerosols and will be relating them to sources in an area where emissions from plants and fuels are quite different from here. And we have established a definite link between aldehyde emissions from alcohol sources and the formation of PAN." — Anita Cohen

Bringing In The Houseplants

As the cool evenings of autumn set in, the Cooperative Extension Association of Suffolk County offers a few tips on bringing houseplants back in:

- Many tropical plants can be damaged at temperatures below 40°F. Start bringing them in before the night temperatures dip that low.
- Just as plants benefit from a gradual change from shade to bright sun when moved outdoors in the spring, they need a gradual reversal to a reduced light situation to avoid shock.
- Plants need much less water indoors in the winter with low light, cooler temperatures and shorter days than during the summer, so avoid the temptation to over water them.
- If plants become potbound, either repot in a larger pot, or prune the top and roots in equal proportion and repot into the same pot with fresh soil.
- Clean the windows while the plants are still outside for a significant difference in available light.
- Consider building a wide shelf lined with waterproof material, in front of the window. Fill it with gravel and set on it more delicate plants that require high humidity.
- Make cuttings from annual flowers, such as coleus, impatiens and begonia. They root readily in water and make colorful houseplants.

Coming Up

The next BNL Lecture will be given by Associate Director of High Energy Physics Research Robert Palmer, on Wednesday, October 23, at 4:30 p.m. in Berkner Hall. His lecture is titled, "Bubbles and Bosons — A Romp Through Memory Lane."

UNIX Course

The Applied Math Department's Central Scientific Computing Facility will offer a UNIX course, "Acquiring at Taste for UNIX," in eight, two-hour sessions. They are scheduled for 10 a.m. to noon, Tuesday, October 22, and Wednesdays from October 30 through December 11. The course will be given in Applied Math's Seminar Room, Building 515.

For more information or to register, call Ronald Wittlock, Ext. 4112.

Arrivals & Departures

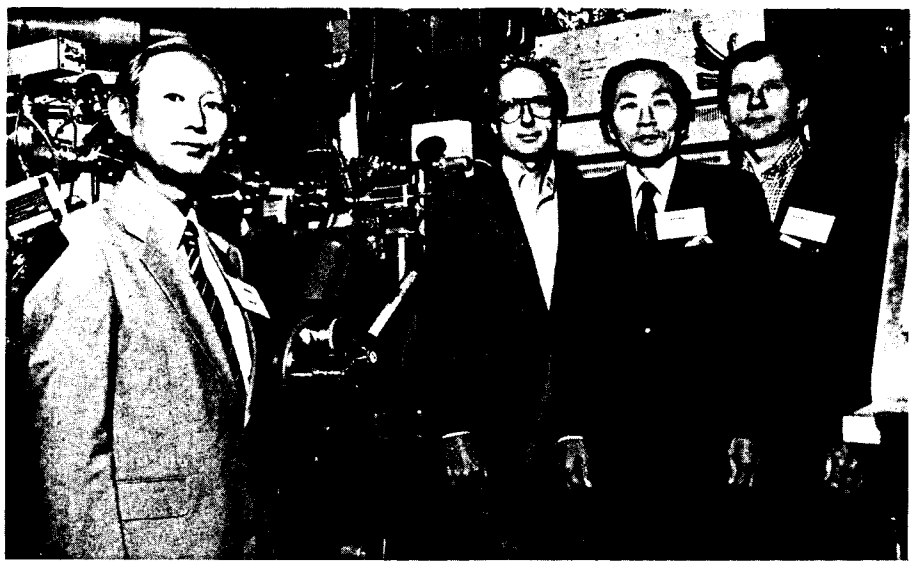
Arrivals

Leesa B. Allen	Physics
Guyla Faigel	Chemistry
Charles Formosa	Plant Eng.
Deborah A. Kerry	S&EP
Shen Li Qiu	Physics
Ann Sutton	Biology

Departures

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

Martin Fallier	Plant Eng.
Paul Fernyhough	Biology
Jose L. Martinez	Physics



Peter Horton

From left, Takashi Namioka, Tohoku University; John Sutherland, BNL Biology Department; Takashi Ito, University of Tokyo; and Eugene Stevens, SUNY at Binghamton.

Japan-U.S. Seminar on VUV Radiation

On October 2-5, the Japan-U.S. Seminar on Ultraviolet Photobiology and Spectroscopy Using Synchrotron Radiation was held at the National Synchrotron Light Source. John Sutherland, BNL Biology Department, and Takashi Ito, University of Tokyo, were the conference organizers.

The seminar drew about 30 scientists from both countries, who shared their research on biological applications of vacuum ultraviolet radiation. Papers were presented during specific sessions on vacuum ultraviolet and soft x-ray instrumentation, radiation effects and spectroscopy. Of the scientists pictured above, Sutherland specializes in spectroscopy of biological molecules, Stevens uses Sutherland's beam line at the Light Source, Ito studies ultraviolet radiation damage, and Namioka develops instrumentation.

In the photograph, between Namioka and Sutherland, is a Seya-Namioka monochromator, an instrument that Namioka co-invented. Such a tool is used in experiments as the means of selecting one wavelength band from a broad spectrum of radiation.

Gregorian Lecture:

The Library in a New Age

Vartan Gregorian

Vartan Gregorian told the guests at the opening of the new Gottesman Hall at The New York Public Library, last May, that he was determined to "reinvigorate the entire New York Public Library system, to endow our collections, to introduce modern technology and to cope with the monumental task of conservation and preservation of mankind's record."

When he was appointed President and Chief Executive Officer of the Library, in 1981, that venerable institution was ailing. Since then, Gregorian has been credited with energizing supporters, restoring the Library structure and tirelessly promoting the Library as a cultural center and one of the City's most important institutions.

On Friday, October 18, at 3:30 p.m. in a special lecture at Berkner Hall, employees will have an opportunity to hear Gregorian talk about "The Library in the Age of Information." The public is also invited. Coffee will be served at 3 p.m.

Vartan Gregorian was born in Iran and educated in Beirut, Lebanon. He immigrated to the United States in 1955 and received a scholarship from Stanford University where he received his B.A. and a Ph.D. in history and the humanities.

Gregorian is a teacher. His teaching experience began at San Francisco State College in 1960 and continued at the University of Texas at Austin. In 1972 he joined the faculty of the University of Pennsylvania where he was a professor until 1984. He taught history and south Asian history and held the Tarzian Chair for Armenian and Caucasian History. At the University, he was provost from 1978 to 1980. Even though Library commitments are heavy, Gregorian still leaves some time for teaching. Currently, he is professor of history at The New School for Social Research and a professor of history and near eastern studies at New York University.

He holds 13 honorary degrees from colleges and universities including Brown University, The Jewish Theological Seminary and Boston University.

Gregorian has many Board and Committee memberships. Among them: Trustee of Boston University; chairman of the Board of Visitors of the Graduate School and University Center of the City University of New York; and The New York City Mayor's Commission on the Year 2000.

Dance of India At Stony Brook

In celebration of the nationwide 1985-86 Festival of India, Hema Rajagopalan, one of India's renowned Barathanatyam dancers, will perform at the Union Auditorium, SUNY at Stony Brook, on Sunday, October 13, at 3 p.m. Tickets will be sold at the door: $10 or $5 for general admission, and $3 for students.

Barathanatyam, a classical dance of South India, is a complex and highly developed art form involving three main aspects: pure dance, facial expression and dramatization. Hema Rajagopalan is one of the foremost experts of this dance and has performed all over the world.

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Early Music Concert Oct. 16

"Sensuous Renaissance" is the title of the musical program to be presented at Berkner Hall at 8:30 p.m. on Wednesday, October 16, by the Ensemble For Early Music.

The Ensemble is noted for its vibrant performances of music from the medieval to the early classic periods, including everything from bawdy ballads of worldly brilliance to the mystical glories of sacred motets. Founded in 1974, the Ensemble recreates the ambience of a particular era through the use of authentic instruments and voices, together with techniques of performance that blend imaginative insight with sound scholarship.

Tickets for the concert will be sold at the door. Prices are $9 for general admission, $6 for students and those over 65, and $5 for those under 18. The Ensemble will be presenting the same "Sensuous Renaissance" program at Alice Tully Hall in New York City a week after their engagement at the Laboratory, so the October 16 concert is a good opportunity to hear a top-notch group at less than top prices.

Winners' Circle

Pat Andrisani was awarded $25 for developing a packing list for use by the Supply and Materiel Division. Use of the form is expected to improve communication and record keeping.

WIS Reception

Brookhaven Women in Science is having a wine and cheese reception for its new members on Tuesday, October 15, from 4-6 p.m. at the Recreation Bldg. Everyone is invited, and refreshments are free. Come and bring a friend.

Murder is Profitable

"Murder in the Laboratory," the dramatic presentation of actual Victorian murder cases by crime historian and story teller E.J. Wagner last Saturday night, netted $1,300 for the Renate W. Chasman Scholarship fund. According to Mary Kinsley of the scholarship committee of Brookhaven Women in Science, this third fundraiser was attended by 300 people, and they brought the total in the fund up to $3,900.

The purpose of the Chasman Scholarship is to encourage women to resume their education full-time in scientific and technical fields. Women who are residents of Long Island and are returning to school after an interruption are eligibile, and selection will be based on merit. One-time awards of $1,000 will be made, to be applied to college and university expenses.

The scholarship was established by Brookhaven WIS in memory of Renate Chasman (1932-1977), a BNL accelerator theorist who developed a new design of electron storage rings optimized for synchrotron radiation research. The design of the storage rings at the National Synchrotron Light Source is based on her work.

Those who wish to make a tax-deductible contribution may forward their checks, made out to the Chasman Scholarship Fund, to Mary Kinsley, Bldg. 426.

NYC Train Trip

Long Island Rail Road trips to New York City are sponsored by BNL and organized by Adrienne Usher, a member of the Hospitality Committee. By having a minimum of 30 people per trip, tickets can be purchased at a discounted group rate. Going to the city, those on the train trip travel as a group from the Patchogue LIRR station. On the train, return-trip tickets are distributed and may be used on any returning train the same day, including the midnight train.

Tickets are sold on a first-come, first-served basis. The fare for the Wednesday trips is $5/ticket; Saturday trips are $6.50/ticket. Children under five years of age ride free.

To make a reservation, send a check via the U.S. mail to BNL, P.O. Box 322, Upton, NY 11973. The check should be made out to BNL or cash, and include your telephone number and date of the trip on the back of the check. Please send a separate check for each trip.

For Wednesday trips, checks must be received by the Friday preceding the trip. For the Saturday trips, the checks must be received by the Thursday preceding the trip. Your reservation is made when your check is received. If you would like to have confirmation of receipt of your check, please enclose a self-addressed, stamped envelope.

The train trips leave from the Patchogue LIRR Station at 7:55 a.m on Wednesdays and at 8:31 a.m on Saturdays. Be at the train station 15 minutes before departure time.

Trips for the remainder of 1985 are:

	Wednesday	Saturday
October	2, 16, 30	19
November	6, 20	9, 30
December	4, 18	7, 14, 28

Diners Note

The Cafeteria will be closed on Saturday, October 12. On that day, Snack Bar Service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

Cafeteria Menu

Week of October 14

Monday, October 14		
Cream of chicken soup	(cup)	.65
	(bowl)	.85
Potted Swiss steak & 1 veg.		2.40
Italian sausages rissoto		2.35
Hot Deli: Smoked turkey breast	(bread)	2.35
	(roll)	2.40
Tuesday, October 15		
Mulligatawny soup	(cup)	.65
	(bowl)	.85
London broil au jus & 1 veg.		2.45
Turkey vegetable oriental w/rice		2.40
Hot Deli: Veal pattie Parmesan on roll		2.45
Wednesday, October 16		
Cream of tomato soup	(cup)	.65
	(bowl)	.85
Ham & broccoli roll & 1 veg		2.40
Baked meatloaf/mushroom gravy & 1 veg.		2.40
Hot Deli: Garden club roast beef		2.40
Thursday, October 17		
Cream of mushroom soup	(cup)	.65
	(bowl)	.85
Roast turkey w/bread stuffing		2.40
Baked ziti w/garlic bread		2.40
Hot Deli: Breast of chicken	(bread)	2.20
	(roll)	2.35
Friday, October 18		
Clam bisque	(cup)	.65
	(bowl)	.85
Seafood Newburg over rice		2.40
Fried seafood platter		2.40
Hot Deli: Monte Cristo sandwich		2.35

BERA News

Swim Club

The BNL Swim Club will meet at the pool on Thursday, October 17, at 5:15 p.m. for a ½ mile to one mile graduated workout. An optional time trial will be held afterwards. All those who can swim at least two laps of the pool without stopping are welcome.

Members interested in competing on a BNL swim team are invited to practices on Thursday, October 24, and October 31, at 5:30 p.m. at the pool. For more information, contact Marsha Belford, Ext. 3327, or Mark Catan, Ext. 5060.

Volleyball

A referee clinic will be held on Monday, October 14, at 5:30 p.m. in the gym, with volleyball practice afterwards. Volleyball Leagues 1 and 2 will begin their season on Monday, October 21; League 3 and the Open League will begin their season on Wednesday, October 23. Team captains should send their team fee, payable to BERA, to Pat Carr, Bldg. 510A, no later than October 14.

Theater Group

The BERA Theater Group will hold its October meeting in the theater at Berkner Hall, on Thursday, October 17. Socializing begins at 7:30 p.m.; the business meeting starts at 8 p.m.

The program will include a discussion of possible productions during the holiday season and selected readings from possible presentations. Interested persons from the Lab community, as well as regular group members, are encouraged to attend. Those with suggestions or information requests should contact Karl Swyler at Ext. 7171.

Motorcycle Club

A meeting will be held on Monday, October 14, at 5:15 p.m. at the Recreation Building. Everyone is welcome.

Golf

The final BGA tournament and end-of-the-year awards dinner will be held at the Fox Hill Country Club in Baiting Hollow, Friday, October 25. Tee off will be at noon. The tournament costs $14 for BGA members and $27 for non-members. It includes greens fee, tournament fee and cost of the dinner. The deadline for signing up is Friday, October 18, and entry fees must be paid by that date. Checks should be made payable to the BERA Golf Association. Entry fees should be sent to Bob Mills, Bldg. 901, Ext. 5043.

Singles Club

The next meeting of the BNL Singles Club will be held in the Berkner Hall Lobby on Tuesday, October 16, from 12:20 to 12:40 p.m. Because of Hurricane Gloria, the Murder Mystery night was changed to Saturday, October 19. Two tickets are still available. For more information, contact Doris Terry, Ext. 2228.

Astronomical Society

The public night at the observatory this month is scheduled for Friday, October 11, beginning about 7:30 p.m., with the following Friday as the rain date.

For the next few months, Halley's Comet will be the most frequently observed object, and the number of viewers is expected to increase. Those planning to attend should call Bob Mills, Ext. 5043, or Rick Jackimowicz, Ext. 3803, during the afternoon in question.

Bowling

Red/Green League

High games were bowled by C. Neuls 233, F. Griswold 219, S. Dimaiuta 208, R. Larsen 202, W. Kristiansen 202, H. Marshall 201.

White League

Paul Callegari rolled a 235, Vito Manzella 219/199, Carl Jacobs 196, Karen Vogel 178, Kathy Griffin 168/164, Pat Manzella 168, Nancy Erickson 167.

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.

2337 CHAUFFEUR - Must have valid New York State driver's license. Staff Services Division.

2338. RESIDENCE CUSTODIAN - Staff Services Division

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2339. SCIENTIFIC ASSOCIATE - Requires a BS/MS degree or equivalent in physics or health physics plus several years' experience at a high-energy accelerator. Duties will include supporting the AGS general safety program with specific responsibilities for evaluation of radiation exposure control practices, radiation monitoring and dosimetry, shielding of transport and target areas and experimental beam line safety. Safety and Environmental Protection Division.

2340. NUCLEAR REACTOR OPERATOR TRAINEE - (two positions) AAS degree or equivalent plus previous experience in reactor operations required. Must have good mechanical ability and aptitude and be able to work rotating shifts. "Q" clearance required. Prior Naval experience desired. Reactor Division.

2341. REACTOR SUPPORT ENGINEER - Requires a BS degree or equivalent in nuclear, mechanical or electrical engineering for eventual qualification as HFBR Shift Supervisor. High mechanical aptitude and previous reactor operations, design or maintaining background desired. Previous Naval experience a plus, "Q" clearance required. Reactor Division

2342. TECHNICAL POSITION - Requires AAS degree in mechanical technology or equivalent and a minimum of three years' experience in construction of experimental equipment. Experience with machine tools necessary. Will participate in the development of new instrumentation for Heavy Ion Research Group. Some familiarity with basic electronics desirable. Physics Department.

Autos & Auto Supplies

80 POP-UP CAMPER - sleeps 6, sink, stove, heater, icebox, excel. cond., $2,000. 399-0828.

TOW BAR - heavy duty, 5000 lb. cap., frame/bumber mount, new, $125. 289-0413.

53 HARLEY DAVIDSON 1200 - needs some work, $4,000 neg; 79 Triumph motorcycle, 750cc, 9,400 mi., $1,600. Mark, Ext. 2043 or 698-5748.

75 CHEVY NOVA - 2 dr., V8, a/t, a/c, p/s, $200. 475-7107 eves.

80 CHEVY MONZA - hatchback, new clutch, tires, brakes, rebuilt eng., excel. cond., $1,495. 751-4822.

78 KZ400 - low mi., very good cond., dealer maintained, recent inspection and parts, $650. 281-0360.

80 OMEGA - 2 dr. hard top, excel. cond., a/c, 6 cyl., $3,800. Ext. 2050 or 473-6432.

79 MERCURY COUGAR XR-7 - a/t, p/s, p/w, p/b, a/c, am/fm, leather int., tilt wheel. Tony, 698-9274.

82 TOYOTA TERCEL - 2 dr. sedan, 4 spd., a/c, am/fm stereo cassette, low mi., excel. cond., $3,950. Ext. 4153 or 732-5829.

73 CHEVY IMPALA - p/s, a/c, runs well, $400. Jim, Ext. 3372.

83 CAMARO Z28 - 31k, T-top, 8 cyl., full power, loaded w/extras, must sell, $9,300. Tom, 757-2178.

61 CJ5 - Buick V6, rebuilt trans. and transfer case, new exhaust, top. Bill S., Ext. 4434 or 399-6168.

RACING GO-KART - 2 cycle, Yamaha eng. and chassis w/many extras, spares, $1,000. 878-6469.

81 BUICK SKYLARK - 6 cyl., am/fm, black, mint cond., best offer. Mike, Ext. 7698 or 581-8891 eves.

AUTO PARTS - steering wheel, 15", $10; Penske timing light, $20; tires, (1) L78-15, (2) G78-14 snow, $10, (1) space saver G78-14, $30. Tony, Ext. 7772.

76 HONDA DIRT BIKE - 125CC, good cond., $250. Ext. 5371 or 286-0126 eves.

83 CHEVY PICKUP - 4 WD, low mi., self-cont., truck camper, excel. cond., $11,500 firm. 399-1868.

79 CAMARO - 85k mi., a/t, 305 V8, maroon, am/fm, mint cond., $3,500. John, Ext. 4636 or 732-7568 after 6 p.m.

76 FORD SHOW VAN - V8, a/t, customized. Ray, Ext. 3536 or 289-7615.

TIRES - (3), A-78-13" snows, (1) A-78-14" w/rim, good cond., make offer. Janet, Ext. 2345 or 929-8152.

74 NOVA - rebuilt, 6 cyl., a/t, good rubber, body clean, runs excel., $1,000. Mike, Ext. 3464.

81 PLYMOUTH HORIZON - 4 dr., 3 spd., good cond., $2,000; '73 MG, runs well, needs some body work, best offer. 325-1298.

80 OLDS OMEGA - 4 dr., a/t, p/s, p/b, orig. owner, $2,400; '74 Ford pickup, 1/2 ton, $1,500. Ext. 7130 or 929-8323.

80 DATSUN 200SX - 30 mpg, 5 spd., 70k mi., $2,750. 473-2014.

73 CHEVY MALIBU - 2 dr., 8 cyl., p/s, p/b, a/t, 76k mi., mint cond., $700. Helen, Ext. 2601.

74 CORVETTE - 65k mi., needs cosmetic work in & out, $6,000. Ralph, Ext. 2539.

78 CHEVY MONZA - hatchback, a/t, sunroof, new tires & brakes, am/fm cassette, excel. cond. 751-7140.

76 CHEVY MALIBU WAGON - 8 pass., roof rack, new brakes & tires, excel. mech., reliable, $500 or best offer. Ext. 2830 or 543-0487.

74 PINTO WAGON - 56k mi., inspected 7/85, $700. Raul, Ext. 4331 or 924-1421.

78 ASPEN - special edition, 4 dr., a/c, am/fm radio, good tires, new starter & alt., clean, runs well, $1,100. Ext. 2945 or 744-4594.

83 FORD ECONOLINE 150 - 17k mi., sunroof, (2) Aviator windows, running boards, Mitsabishi stereo, excel., $7,500. Bob, 588-0677.

73 MERCURY COUGAR XR7 - p/s, p/b, a/c, a/t, p/w, am/fm stereo cass. w/equal., new custom wheels & tires, excel. body & int., $1,950. Barry, Ext. 5624.

71 BUICK LESABRE - a/t, p/s, p/b, a/c, $400. 584-7750 after 6 p.m.

80 TRANS AM - a/c, new brakes, shocks & tires, am/fm stereo, 43k mi., $5,800 neg. 929-4957.

STEERING WHEEL - 15", $10; Penske timing light, $20. Ext. 7772.

Boats & Marine Supplies

19' SPORT CRAFT - glass, cuddy cabin, 115 HP Mercury, best offer. Mike, Ext. 7698 or 273-7977 eves.

26' SAILBOAT - 1972, Peason, 15 HP eng., 5 sails, d/f. Ext. 3921 or 689-9214.

20' CLAMBOAT - Coombs Garvy, all fiberglass on wood, can be seen in water, Brookhaven Hamlet, $300. Ext. 5371 or 286-0126 eves.

28' OWENS - sleeps 4, stove, sink, standup head, new canvas and hardtop, fully equiped, $2,000 firm. 281-0360.

16' SAILBOAT - 420 racing, trailer, fiberglass, $600. Jim, Ext. 3372.

25' CHRIS CRAFT - sleeps 4, in water, storm damaged, $750 or best offer. Ext. 3928 or 924-0651.

16' V HULL BOWRIDER - 1983 4 Winns, 120 HP Merc. cruiser, 15 hrs., full canvases, galv. trailer, power winch, garaged, $7,800 firm. 286-8797.

15' MFG - 1959 fiberglass, good cond., extras, $300. Bob, Ext. 4562 or 744-2913.

CRUISERS INC. - 1970, I/O, 165 HP Chevy, 6 cyl., with trailer, fully equipped, cabin, head, full canvas, $4,700. 929-3234.

Miscellaneous

TELESCOPE - 3" Unitron, Equatorial mount, drive motor, tripod, carrying cases, new cost $1,300, sell for $595. 589-3608.

WOMEN'S TENNIS SHOES - Nike, 7-1/2, leather, $20. Chris, Ext. 2907.

FURNITURE - end tables, lamps, gas grill, no tank, reasonably priced. 475-8162 eves.

Ticket sales reached the half way mark this week, but 200 tickets are still available for BERA's Special Event — a Dinner-Theater evening. The gala includes a cash bar and fashion show during the cocktail hour; a five-course gourmet dinner with your choice of prime rib of beef or chicken cordon bleu; the musical "Two-by-Two," starring the Broad Hollow Players; a Viennese Table of pasteries for dessert after the show; and dancing to a band and records until the wee hours of the morning. All this in one evening for only $22.50 per person.

70 DODGE DART - runs, needs engine work, new tires, body good, $100; '70 Cadillac, good running cond., new tires, $250. 589-6803 after 6 p.m.

70 NOVA - a/t, p/s, reliable eng. & trans., new suspension & exhaust system, $400. Walt, Ext. 2907 or 698-0576.

78 CHEVETTE - 2 dr., 4 spd., 30 mpg, good cond., $1,200. Ext. 2610 or 924-5272.

80 CITATION PARTS - collision, 2 dr., hatchback, 4 spd., p/s, p/b, a/c, best offer. Erik, Ext. 2609 or 4603.

78 CADILLAC - Fleetwood Brougham, like new, $4,900. 475-4596.

84 KTM MOTORCYCLE - 125cc, $975. Ext. 3499 or 325-9580 after 6 p.m.

60 CORVAIR SEDAN - good cond., new batt. & tires, $250. 363-9527.

73 FORD LTD - wagon, new tires, exhaust & brakes, $750 neg. Neil, Ext. 2023.

78 VW RABBIT - very depend., no rust, 4 spd., reg. gas. Allen, 286-2265 after 7 p.m.

74 DODGE DART - 56k mi., orig. owner, very good running. Dan, Ext. 2319.

83 MERCURY MARQUIS - Brougham, fully loaded, like new, $6,700. Debra, Ext. 2896 after 3 p.m.

77 HONDA CIVIC - hatchback, 4 spd., new trans. & clutch, 38 mpg, 42k, good mech., $775. Ext. 3164.

SOFT TOP - for CJ5 Jeep, new, incl. all hardware, $150; hardtop for CJ5 Jeep, very good cond., $200. Joe Bush, Ext. 4638 or beeper 572.

WINTER JACKET - new, sheeplined, bomber type, beige suede, $45; back issues of Reader's Digest, Health Prevention book; old antique vise, heavy duty, $50. 732-3388.

FURNITURE - black naugahyde, 88" couch, $150; club chair and ottoman, $50; hi-back recliner, good cond., $50. 751-6076.

WASHING MACHINE - GE, rust, very good cond., $50; triple dresser, 9-drawers, 72" long, $45; kitchen table, yellow formica, chrome legs, 35"x40", $25; old winepress, $25. 281-7844.

STORM SCREEN DOOR - wooden extension ladders, good cond., any offer. Kanuga, 475-1254.

COLOR TV - 13", almost new, $85; 2-spd. fan, $15. Sandy, Ext. 3369.

TENNIS RACQUET - Borg, midsize, graphite ash nylon strings, excel. cond., $45. 751-4822.

FIREWOOD - split, seasoned oak 4'x16'x20-22" pieces, delivered, $110. 732-2849.

SKIS - Elan 160's, Tyrolia bindings, men's Caber boots, 8-1/2, good beginner/intermediate set, $150. Ext. 4530 or 261-2719.

TI-99 COMPUTER - with cassette storage device, plus 911 accessories, still in boxes, $50. Ken, Ext. 3263.

TRUMPET - for beginner, case, $50. Jim, Ext. 3372.

ATARI COMPUTER SYSTEM - (4) games, (2) sets, controllers, new, $50; Timex personal computer, new, $20; Underwood portable typewriter, $95; (2) Royal stds, all excel. cond., $35 and $50. 265-0501.

WOOD STOVE - Jotul Combi Fire, No. 4, chimney avail., $200; fireplace enclosure, quality brass Glassmaster w/screen, good cond., $100. 744-4611 after 6 p.m.

GE DISHWASHER - portable, good cond., $75. Gerry, Ext. 3694 or 281-8296 after 6 p.m.

CLOCK RADIO - Monika #3117, $10. Ext. 3422.

DOBERMAN PUPS - 10 wks., akc, male, suitable for show or obedience, $300. 751-0182.

JAPANESE YEWS - Taxus Cuspidata Capitata, 2 ft. transplants, field grown, $12 ea.; hemlocks (Tsuga Canadesis), 3 ft., field grown, $10 ea. 589-4363 after 6 p.m.

TURNTABLE - linear tracking, programmable, plays both sides, Audio-Technica cartridges, almost new, still under warranty, $170. Hans, Ext. 4584 or 281-5563.

OPERA TICKETS - (2), Khovanschina, BERA seats, October 29. Weeks, Ext. 2617 or 751-1149 after 6 p.m.

ANSWERING MACHINE - duel tape, $50. 878-6528.

SLIDING PATIO DOOR - 6 ft., alum., double insulated glass, screen incl., $50. 473-6546.

SIAMESE CATS - kittens & adults. Ramona, 928-3088.

SHINGLES - hand split, 15 bundles, $100. Andy, Ext. 2907.

KEROSENE HEATER - Sears, 19,000 btu, used one season, $50. Dick, Ext. 3273.

LAWN CHAIRS - (2), with cushions, $5 ea. Frank, 981-2529.

GE RANGE - countertop style, $30. Ext. 4192.

SNOW PLOW - 7 ft., new, with truck mount frame, but without lifting mechanism, $75. Tom, Ext. 4084 or 878-1060.

FIREPLACE HOOD - elegant, dramatic, matte black, easily installed, value $600, sell for $150. Muller, Ext. 2747 or 563-3840.

SNOW PLOW - 6' blade, with motor & hydraulics, $75. 289-0413.

Yard Sales

BELLPORT - 16 2nd St. between N. Brewster & Jersey Ave., 10/12-10/13, 9:30 a.m.-4:00 p.m.

Free

FIRE WOOD - oak. 744-2218.

FREEZER - chest type, old, GE, works o.k., you pick up. Ext. 4475.

Lost & Found

TAKEN BY MISTAKE - women's trench coat, Saturday night at Berkner Hall, you might have mine. Mary Phillips, Ext. 3080.

Car Pool

BABYLON/W. ISLIP - driver needed for on-time car pool, 8:30 a.m. - 5:00 p.m. M. Tesla, Ext. 3284.

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

WADING RIVER - 1 bdrm. house, 10 min. to Lab., near beach and Wildwood Park, modern, coal stove, $500 mo. plus util., 2 mo. deposit. 929-8588 or 212-320-2369 eves.

SHIRLEY - small studio. Manhattan kitchen, priv. ent., security lighting, w/w, cable, near shopping, incl. util., $390 mo. 399-3910.

N. SHIRLEY - large furn. apt. w/kitchen, priv. ent., util. incl., 1 person only, non-smoker, no pets, security, $400 mo. pays all, 5 min. from Lab., avail. Oct. 1. 281-8044.

E. MORICHES - small house, 3 bdrms., 2 baths, wood stove, garage, 1/2 block to Bay, 1 yr. lease, $680 mo. plus util. Michael, Ext. 2081 or 878-9384 after 6 p.m.

WESTBURY - 3 bdrm. split level, 2-1/2 baths, all appl., avail. immed., quiet neighborhood. (718) 629-2720.

MASTIC BEACH - walk to water, 3 bdrm. ranch, garage, Florida room w/fireplace, private, pretty, economical, $650. 399-1736 after 6 p.m.

STRATHMORE RIDGE - 2 bdrms., 1-1/2 baths, central a/c, all appl., available 11/1/85, $650 mo. plus util. Ext. 3541 or 924-4070.

For Sale

S. JAMESPORT - 1/2 acre, priv. wooded bldg. lot, short walk to beach, $38,500. 727-7741 after 6 p.m.

ROCKY POINT - 4 bdrm. ranch, 2-baths, gas heat, fenced yard, central a/c, priv. beach, $127,500. Ext. 3123 or 821-1039.

MIDDLE ISLAND - nature lover's delight, Colonial, on 4 acres w/private pond, 1 bdrm., spacious l/r with f/p, eik, d/r, 1-1/2 baths, basement, garage, greenhouse, open house. Monday 10/14/85. Skip, Ext. 2665.

Wanted

PAINTER - for inside house, hallway and (2) bdrms., reasonable prices. 751-4822.

APARTMENT - needed for 26 yr. old man and dog, within 15 mi. of Lab. Ext. 4496.

PERSONS - to have house parties, no investment, high commission, leather goods, jewelry, novelties. Reggie, 472-3236.

CHILD CARE - for 17 mo. old boy, near or on site preferred. Ext. 3341 or 399-4552 eves.

BABYSITTER - for 2 children in my home, 8:30-6:00 p.m., Monday-Friday. Ellie, 360-5182 or 689-7943.

HEATER - for small greenhouse. 281-7330.

EDIBLE WILD MUSHROOMS - Nick. Ext. 2490.

PEOPLE - for group order of generators. Specs: 400 watts, 8 HP, 1800 rpm, 2 cyl., 4 cycles, elec. & recoil starter, volt & amp meters, 1 gal. fuel tank for gasoline or LP, direct from manufacturer, priced between $400-$500 for a $1,000 machine. Ray LoPresti, Ext. 5042 at lunchtime.

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

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