BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Statisticians Meet At BNL

Doug Humphrey

Statisticians from national labs, universities and other organizations across the country gathered at BNL last week to present papers and exchange ideas during a three-day statistical symposium sponsored by DOE. An annual event since 1975, this is the first time the symposium has been held at the Lab. Among the 80 participants were, from left, John Van Ryzin, Professor of Biostatistics and Mathematical Statistics at Columbia University and BNL Senior Mathematician; Ronald Peierls, Chairman of BNL's Applied Math Department; and Richard Barlow, Professor at IEOR and Statistics Operations Research Center, University of California at Berkeley.

Nothing Is Certain But Uncertainty

Herbert Robbins shares an office on the second floor of the Applied Math Department. His nameplate on the door is smaller than his roommate's, but he says that's fair since he works only quarter-time. He also says that when he's at his desk he does nothing but scribble on pieces of paper, most of which end up in the trash.

Actually, Robbins' chief occupation is that of Higgins Professor of Mathematical Statistics at Columbia University. He also directs two government-sponsored research projects for the National Science Foundation and the National Institutes of Health. "That's my professional life, which is perfectly conventional," he says. "My relationship with Brookhaven is a little bit out of the ordinary."

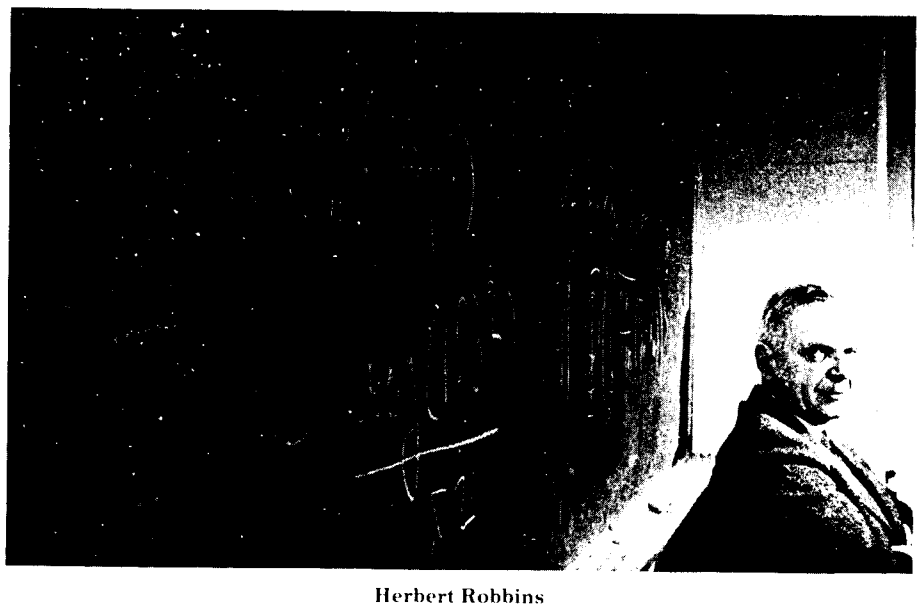
As if to explain, he says he's a mathematician with an interest in random or chance phenomena — things which have many unexplained causes. "I'm interested in answering questions that arise about the interpretation of mass events where there is a lot of noise," says Robbins. "For example, not everybody who gets penicillin recovers from pneumonia, nor do they all drop dead. It's somewhere in between. Why does it work for one and not another? Why do some people get cancer and others don't? Why can some people learn to play the piano like Horowitz and other can't carry a tune?" While these aren't the actual questions he addresses, they are the kinds of problems to which his work has application.

For example, one of the things that interests him is the design of clinical trials to find out whether or not a proposed new treatment for some condition is in fact better than the treatment it is supposed to replace. The New York Times recently carried an article on a new heart drug. It was so successful in preventing deaths of heart patients in a national study that tests were cut short because the doctors in charge felt it unethical to withhold the medication from those patients in the control group taking placebos.

"Was it the right decision to end the study before all the answers were in?" asks Robbins. "How do you balance the possible harm done to the people getting the placebo against the possible harm done to future patients if in fact not enough study was done to be really certain of the drug's effects?

"In principle, to achieve certainty, one has to acquire an infinite amount of information," he continues, "and to acquire that information is not just a question of money or time. In this case, it's also a question of people's lives. Eventually one has to say, 'we are not sure, but we feel it is suffi-

(Continued on page 2)



Doug Humphrey

Herbert Robbins

Drill Date Is November 23

A total evacuation drill of the Laboratory site has been set for Monday, November 23, beginning at 4 p.m. As announced in the Bulletin of October 30, the drill has been scheduled to verify certain procedures in the Laboratory's Emergency Plan. With the exception of essential personnel necessary for continuity of operations, all employees are requested to leave the site in accordance with instructions. Personnel who must remain will be notified in advance.

The instructions for evacuation were distributed last week by the Safety & Environmental Protection Division. Employees should read them carefully and understand them.

The drill will begin with the sounding of the **warbling air horns** at 4 p.m. This is the site alert. If you are in your own office, act as you would at the end of the day — turn out the lights, turn off appliances, etc., and proceed to the designated area in your building. If you don't know where this is, find out now from your department safety coordinator. If you find yourself in unfamiliar surroundings, go to the nearest principal building and ask where the designated area is.

About 4:10 p.m., the three site **sirens** will sound for approximately one minute. This is the signal to leave the site immediately. Proceed quickly but safely to your car and go home. All three gates will be open. Employees going out the north gate with the intention of going south on William Floyd should be aware that there will be no turnaround at that point. They will have to go up to Rte. 25, around the cloverleaf, and south on William Floyd.

Carpools should not attempt to assemble on site by driving from one building to another. As the purpose of this drill is to see how quickly a total evacuation can be accomplished, employees should not spend time waiting for carpool members. If you cannot match up at once with your carpool, take any available ride and have the driver drop you off along the road leading into the Parr Meadows Race Track from William Floyd Parkway. This is the offsite assembly point. There, carpools will wait until they have collected all their passengers, and then proceed home. For the purpose of this drill, carpool members should discuss in advance whether they will be able to assemble on site, or whether they will leave separately and reunite at the assembly point.

At 4 p.m., the incoming light at the gate will be placed on red and no traffic will be allowed to enter until the end of the drill. Suffolk County police will be at strategic locations off-site to keep traffic moving.

Employees, such as shift workers who are not on duty, but who must come back to complete their shifts, may do so at approximately 4:30 p.m. when the drill will be declared completed.

Visitors and contractors are expected to leave the site in the same manner as employees. For purposes of this drill on-site residents **are not expected to evacuate the site.** Apartment dwellers should go to their quarters and stay there until 4:30 p.m. Their families are requested to stay indoors from 4:00 - 4:30 p.m. Those who reside in dormitories will proceed to their dorms and remain indoors until the drill is over.

Before the end of the drill, a sweep of the Lab site will be made by the Laboratory emergency forces to see that only authorized employees remain.

The evacuation proceedings will be video taped, and the tapes reviewed the next day by coordinators and key personnel to see how well the procedures worked, and what modifications might be made.

The Going Gets Tougher

Some major issues now being debated by the Cost Cutting Committee involve some very difficult decisions for the Laboratory.

The first of these has to do with people's pay. Everyone dislikes a general pay cut, or payless work days, but as FY 83 is expected to be as lean a budget year as this one, the committee is looking at an alternative - to delay next year's pay raises. This is the way it would work. There would be no delay for those making under $25,000 per year; for those in the $25,000 - $40,000 per year category, raises would be deferred for three months; and for those making over $40,000 a year the waiting period would be six months. (The salary groups would be based on results of the spring rate review and, hence, on prospective salary rates for FY 83). The committee estimates that the projected savings would be about $1.5 million.

A second possibility is a reduction in the Lab's contribution to retirement funds, at present, an amount equal to 10% of base salary. The only required contribution from employees is 5% from those making over $29,700 (the current social security base). A one percent reduction in the Lab's contribution, from 10% to 9%, would amount to a savings of about $750,000 each year. The committee recognizes the difficulties with this suggestion. Of all the payroll cost reduction measures, this would have the least short-term effect on employees, but there would be a serious long-term effect in the reduction of retirement benefits, which are already suffering from inflation in the cost of living.

Also under consideration by the committee is the general problem of Laboratory activities which are not being supported either by direct program funding, or by funding from other BNL programs which use the specific services. Perhaps the prime example is the Central Scientific Computing Facility (CSCF). With many research groups now possessing small computers and with tight budgets the order of the day, the CSCF is "under distributed " to the tune of about $1 million a year. This undistributed cost then becomes part of the general and administrative overhead

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Doug Humphrey

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Back in 1977, Leo J. Casey (right) and Ray DeMatteo operated the Composition Group's mechanical phototypesetters. Earlier this year, the old equipment was removed and the room was renovated. Now, (from left) Irene Brusca, Dolores Knighton and Dorothy Berg operate the computerized phototypesetter in a bright, modern office environment.

Computerized Composition

Sometimes, in order to cut costs, it's necessary to spend money. Take the case of the Composition Group in the Photography & Graphic Arts Division. About one year ago, the group invested in the electronic age, replacing its 21-year-old mechanical phototypesetting equipment with a computerized phototypesetter. The investment has already paid off. During a start-up year that has included training, debugging, and other distractions, the group's productivity increased by 23%.

Supervisor Leo J. Casey is proud of this statistic and the way typesetters Dorothy Berg, Irene Brusca and Dolores Knighton have adapted to the equipment. "They've become very proficient," he said, noting that the difference between operating the old and new typesetters is dramatic, even though the end product is the same.

The end product of phototypesetting is printer-ready type — composition. Clearer and sharper than typewriter copy, it is the best choice when quality is critical. "At one time, most BNL reports were typeset and we had three shifts on the mechanical phototypesetters," said Ken Boehm, who supervises all graphic arts activities in Bldg. 197B. "But people have wanted increasingly fast turnaround. With the old equipment, we simply couldn't produce that fast."

"The image the mechanical typesetters created was probably as fine as you can get," said Casey, "but the process was cumbersome." Working with the "mechanical monsters," as Casey called them, "you had to be a machinist in order to keep the equipment going, and you had to be a specialist to work the strange, very peculiar keyboard that was not common to anything but typesetting."

When an operator hit a key, corresponding type was released overhead from the magazine — the case that contained the alphabets of type for a particular font, or type style. As the type was set photographically, the operator could neither see it nor correct it. "If you lost it, you couldn't go back. Corrections had to be reset later," said Dolores Knighton, who worked full-time stripping those corrections into positive film.

The computerized equipment changed that. It looks and acts very much like a word processor, with a regular keyboard and CRT, so operators can see their copy as they set it, make corrections to memory with simple commands, and produce perfect copy. With positive stripping a thing of the past, Knighton became one of the three typesetters who now work with Casey producing more type than four people used to in the mechanical era.

"I love the new era — it should have come sooner," said Casey, explaining that the transition to the electronic age has also had other effects on the Composition Group. "We no longer work in a machine environment with soldering irons, oil, mechanical devices and associated hazards. Now it's a clean, safe, office environment."

Typesetter Dorothy Berg characterized the old shop as "grimy. This is so much better," she said, "more convenient, more organized, and a lot safer." Irene Brusca, who has also experienced both phototypesetting worlds, agrees. "Not only is it safer," she said, "but as we have so much more equipment at hand, in one place, we can get a lot more done."

In essence, composition has traded the physical demands of the obsolete equipment for the mental ones of the computerized phototypesetters. While it's no longer necessary to lift 80-pound magazines to change fonts nine or ten times a day, operators do have to remember the commands to use to access each one of the 16 fonts in 138 different sizes that are on-line at any one time.

The ease with which fonts can be changed is one reason why the computerized phototypesetter is more productive, but Casey expects productivity to increase even more as peripheral equipment comes on line. While the bugs are still being worked out, now proving its worth is a device that ties the Composition Group to P&GA's Word Processing Group, headed by Mary Wigger. Any data on file at the Word Processing Center can be transferred to the phototypesetter's files in a matter of minutes. Once it's there, the operator simply keys in commands for type styles, sizes, etc. The connection also enables Composition to take advantage of Word Processing's OCR unit. OCR stands for "Optical Character Recognition," a process where typewritten pages are "read" into the word processor, eliminating the need for a second keyboarding. Now the material a secretary types in an office can be read by OCR and come out of the phototypesetting processor as type-set copy, without ever having been re-keyboarded.

Eventually, Boehm said, "We hope to be able to receive information from almost any computer file." With this kind of accessibility and the faster turnaround it promises, Boehm added, "We're hoping more people will choose typesetting, because it offers publication cost savings and better quality." For example, on the average, typesetting compacts typewritten material by 40%. This, in turn, saves on such items as paper, postage and printing costs. At the same time, the final product is much more attractive. It's also captured in the typesetter's memory for future updating.

With this ability, the group is now typesetting work that previously might have been done elsewhere. "Last year we contracted out about $56,000 in typesetting services," Boehm said. "We expect to do at least $40,000 of that in-house next year. And as these things get on our permanent files, and only need occasional updating, we'll eliminate this need altogether. We strongly feel we can be as competitive and professional as anyone else in this business. Our equipment is as good and our people are as skilled."

The Bulletin crew will vouch for that. There's a very strong relationship between the Composition Group and the Bulletin staff, who work together every week to meet an unyielding deadline. If you're one of the Bulletin's more observant readers, you will have noticed some typestyle changes during the past year. These have tapered off now that we have found the computerized type which seems to best suit the Bulletin style.

Since different applications call for different styles, the computerized phototypesetter can provide almost any typeface desired, in any of four weights: light, medium, italic and bold. They're also available in sizes ranging from 6 to 72 points (1/12 to 1 inch). These samples, which show some of the typestyles available, were set in 12 point, medium weight type:

Megaron	Bookman
Megaron Bold Cond.	Futura
Schoolbook	*Park Ave*
Baskerville	*Helanna*
Avant Garde	Old English
Chelmsford	*Kaylin*

The Composition Group is planning to demonstrate this equipment and its related communications capability on Friday, December 4. To schedule a visit, call Ken Boehm on Ext. 2935 or Leo Casey on Ext. 2952.

— Anita Cohen

Robbins (Cont'd)

ciently probable that this is the best thing to do, and from now on this is what we recommend everybody should do.' " Robbins points out, however, that there is always a risk of making a terrible mistake, of being misled by an insufficient amount of data.

To minimize this uncertainty, he and other mathematical statisticians go through reams of paper scribbling down equations for calculating probabilities and balancing costs with benefits. Robbins says statistical therory tries to quantify methods of thinking about phenomena in which there is a lot of variation which cannot be explained or eliminated. "Nature throws dice," he says, contrary to a famous remark by Einstein. "What one wants to do is arrive at near certainty about the nature of the uncertainty."

Robbins has invented a kind of statistics called "empirical Bayes." (Bayes' theorem, published in the 1700s, was one of the first to deal with probability.) One aspect of Robbins' theory is described in a yet unpublished report numbering a page for every one of the 15 years he's been at BNL scribbling on bits of paper. It concerns estimating many means or variances, and the mathematics applies to many situations.

He gives an example: Suppose we could look at the accident records of all drivers in New York for the year 1981. We would find that a certain number A of them had no accidents, a smaller number B had one each, an even smaller number C had two each, and so on. We now ask: of those A drivers who were accident-free during 1981, what total number of accidents will they account for during 1982, assuming they all continue to drive in the same general manner?

One could argue that on the assumption that the future will be like the past, this group will again have zero accidents in 1982. Clearly, this is an underestimate. At the other extreme, one could multiply the number A by the average number of accidents per driver for all New York drivers during 1981 to arrive at an overestimate of the number in question.

The empirical Bayes theory of Robbins applied to this particular problem yields B, the number of drivers with one accident each in 1981, as the correct estimate of the total accidents the A drivers, accident-free in 1981, will have in 1982. Robbins says it is not surprising that such a theory has as yet few adherents, since it predicts the future behavior of one group of people by the past behavior of a completely different group. Yet at the DOE statistical symposium held at BNL last week, one of the speakers used the empirical Bayes approach to estimate the risk of cancer due to exposure to pollution or radiation in the presence of confounding factors like age, smoking and socioeconomic status. The speaker also predicted that this approach will become the standard methodology for dealing with a wide variety of statistical problems that cannot be treated by conventional methods.

This summer, Robbins encountered a visitor to the department who was working on estimating the total amount of oil in a number of geological formations. "When I told him I was working on the problem of estimating lots of different means and variances, he said, 'My God, that's exactly what I need.' In fact, he triggered me to write it up," recalls Robbins.

"For thirty years, I brooded about this theory. I hope to spend the next thirty doing something else with my government-issue pencil, paper and trash can."

— Mona S. Rowe

Lecture Reminder

Dr. Sheila Blume, director of the New York State Division of Alcoholism and Alcohol Abuse, will talk about "Alcoholism: What Do We Know About It and What Can We Do About It?" on Wednesday, November 18, at 6 p.m., Room A, Berkner Hall. Her lecture is sponsored by Women In Science. Buffet dinner at 5 p.m. For reservations call Betty Heldman, Ext. 3699.

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Cost Cutters (Continued)

of the Lab and, in effect, becomes a tax on all program accounts. The question the committee is struggling with is whether the combination of the small computers now in use around the site, together with contracted large computer services for those who need them, would be a satisfactory lower cost option than operating our own large computer facility.

No decision has been reached on any of these proposals, but they are an indication of the range of cost-cutting possibilities being examined by the committee.

Camera Club

The next meeting of the Camera Club will be on Wednesday, November 18, 1981 at 5:30 p.m. in the Recreation Building. All members are urged to try to attend this important meeting to help formulate a program for 1982.

The program for this meeting will include two slide shows: "Photo Reports Make It Happen" and "Better Pictures by Existing Light." Guests and prospective members are welcome.

Calling All Singers

Recruits are needed for singers to perform in the annual Christmas concert held in the cafeteria during the holiday season. Rehearsals have been scheduled for Tuesday, November 24, Tuesday, December 1 and Friday, December 4 at noon in Berkner Hall.

Call choral director John Weeks, Ext. 2617, or Arnie Feltman, Ext. 4673, if you are interested in joining the group and would like to know more about the program.

Cafeteria Menu

Week Ending November 20

Monday, November 16

Cream of potato soup	(cup)	.60
	(bowl)	.70
Roast beef au jus w/1 veg.		1.70
Baked chicken w/mushroom & wine sauce & 1 veg.		1.65
Hot Deli: Barbecued ham	(on bread)	1.70
	(on roll)	1.80

Tuesday, November 17

Chicken and rice soup	(cup)	.55
	(bowl)	.65
Grilled pork chop w/applesauce & 1 veg.		1.70
Baked lasagna & 1 veg.		1.65
Hot Deli: Texas jumbo chili & cheese dog		1.70

Wednesday, November 18

Old fashioned bean soup	(cup)	.55
	(bowl)	.65
Veal scallopini & noodles		1.70
Ham & broccoli crepes		1.65
Hot Deli: Meatball hero		1.70

Thursday, November 19

Minestrone soup	(cup)	.55
	(bowl)	.65
Beef teriyaki w/rice		1.70
Baked meatloaf & 1 veg.		1.65
Hot Deli: Corned beef	(on bread)	1.70
	(on roll)	1.80

Friday, November 20

Manhattan clam chowder	(cup)	.60
	(bowl)	.70
Old fashioned beef stew on egg noodles		1.70
Macaroni & cheese w/1 veg.		1.65
Hot Deli: Hot Italian beef	(on bread)	1.70
	(on roll)	1.80

Tea & Sherry Time

"Fun and Fitness" is the theme of the Hospitality Committee's next Tea & Sherry Party, to be held on Thursday, November 19. Included will be demonstrations and information about aerobics, gymnastics, jazz, yoga, belly dancing, kung-fu, cosmetic and color counseling, and nutrition.

All women employees and wives of Laboratory employees and guests are invited to come to the party in the Brookhaven Center from 3:30 to 5:30 p.m. Babysitting will be provided free of charge in the gymnasium.

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to the city on Wednesday, December 2. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $3.50, children under six years ride free.

Reserve a ticket by sending your fare through the U.S. mail to P.O. Box 322, Upton, New York 11973, no later than Tuesday, November 24. Make checks payable to "Brookhaven National Laboratory." Your tickets will be given to you on the train. Refunds will be made only if cancellations are received by the Friday preceding the scheduled trip.

Note: Please put the date of the trip on your check.

Afro-American Party

All BNL employees and their guests are invited to attend a festive Pre-Thanksgiving Party sponsored by the Afro-American Culture Club on Friday, November 20 from 5:30 to 11 p.m. in the Recreation Building.

There will be a cash bar as well as dinner and sandwiches available for purchase.

World Harvest Day

Stand with the world's hungry on November 19. Join thousands of Americans in the fast for a World Harvest. Give up eating for all or part of the day and send your food money to Oxfam America. Donations can be sent to Chip Balzer, Bldg. 475, Ext. 2256. Tax deductible receipts are provided.

Camping Club

The regular monthly meeting of the BNL Family Camping Club will be held on Thursday, November 19, at 8 p.m. in the Recreation Building. Refreshments will be served, followed by a movie.

Contact Chuck Watson, Ext. 5317, for any questions.

Volleyball

Results as of 11/4/81

Open League

The Spikers over Toga, 15-7, 15-11, 15-7, 15-13. Brewmasters over Roga, 15-1, 11-15, 15-9, 15-7. Line One over Burnouts, 12-15, 15-10, 15-3, 15-9.

Standings

Spikers	4-0
Brewmasters	3-1
Line One	3-1
Roga	1-3
Burnouts	1-3
Toga	0-4
Pickups	0-0

Arrivals & Departures

Arrivals

Dhanwant S. Sethi ..... Energy & Env.
Barry Siskind ..... Nuclear Energy

Departures

None

The Coffee Connection?

Doug Humphrey

The BNL Theater Group presents "Exit the Body" on November 13, 14, 20, and 21 in Berkner Hall at 8:30 p.m. Here, Helen O'Toole (Rita Straub) and Sheriff Vernon Cookley (Bill Love) trade suspicions about the summer folk visiting their town: Richard Hammond alias Lyle Rosers (Neil Bassett) and Lillian Seymour (Jane Love) (seated). Meanwhile, maid Jenny (Mitzi Lampert) puzzles over Mr. Hammond's indifference to her coffee. Is there a connection between the coffee and the bodies in the closet? To find out, don't miss this mystery farce. Tickets are $3.00 adults, $2.00 senior citizens and students under 18.

Rifle & Pistol Club

Due to the Laboratory holiday this week, the reglarly scheduled meeting of the Rifle & Pistol Club was postponed to November 17 and will be held in the conference room, Bldg. 490.

Club teams have begun indoor shooting at the Patchogue Armory; the rifle team on the first and third Thursdays of the month, and the pistol team on the second and fourth Thursdays. For additional information call Ed Elliot, Ext. 4636, regarding the rifle team, and Otto Jacobi, Ext. 4406, regarding the pistol team.

Anyone interested in trap shooting on Sunday mornings at 9:30 a.m., contact Vincent Lettieri, Ext. 4092, or Otto Jacobi.

Bowling

White League

High games were rolled by B. Belligan 222, T. Erickson 203. The Dips remain in first place.

Red & Green League

A good night for R. Jones 226/238/620 and G. Meinken 243/201/606. Other good games bowled by R. Meier 234, R. Wiseman 233, E. Sperry 221, H. Marshall 219, J. Cochrane 213, J. Ferrante 209, M. McKenna 208, J. Connelly 202, M. Iarocci 200 and J. Carroll 200.

Pink League

The Knockouts are in first place by one point. High games were bowled by R. Rosati 178, H. Keeley 170, D. Johnson 160.

Postal Note

What's the best way to make sure your holiday gifts will arrive at their destinations **before** the holidays? Just heed the Post Office's slogan and "Shop early. Mail early."

While there's no official deadline for domestic mail, Marianne Vitale, Postmaster of the Upton Post Office, advises sending your cards, letters and parcels at least a week before you'd like them to arrive. For international mail, the Post Office has established the following deadlines to assure the timely arrival of airmail (it is already too late to guarantee that surface mail can be delivered overseas before Christmas):

Destination	Air Parcels	Airmail Letters Cards
Australia	11/27	11/30
Mid East	11/27	12/4
Africa	11/27	12/7
Central & South America, Southeast Asia	11/30	11/30
Europe, Far East	12/7	12/11
Caribbean, W. Indies	12/11	12/14

If you're sending mail to someone in the military, deadlines vary depending on where the person is stationed. For information on those dates, just stop by the Upton Post Office. While you're there, pick up a pamphlet outlining tips for preparing packages for mailing to make sure they arrive at their destination in good shape.

Give A Little — Help A Lot

$50,000 — that's the figure Betty Pergan, United Way chairman, has set as the goal for this year's campaign at BNL. At this point, approximately 15% of the Lab's employees have already pledged over $26,000. Noting that some departments did not even officially begin their campaigns until this week, Pergan is confident that BNL employees will easily bring the total over the top, even in these uncertain economic times. In fact, said Pergan, "People seem to give the most when times are hardest. They must realize that other people need it too."

The BNL campaign will wrap up around Thanksgiving. If you haven't yet returned your pledge card, why not use this one to start your holiday season on a giving note?

LIFE NUMBER	EMPLOYEE NAME	DEPARTMENT	CURRENT DEDUCTION

In support of the Member Agencies of the United Way of Long Island, I hereby authorize Brookhaven National Laboratory to make regular Payroll Deductions for the amount indicated. Payroll Deduction PER PAYDAY To start 1st payday January 1982.

Payroll Status ☐ Weekly ☐ Monthly

1982 CAMPAIGN

1.00 ☐ 2.00 ☐ 3.00 ☐ 4.00 ☐ 5.00 ☐ other ☐

☐ Here's my one-time gift in the amount of $ ..... Paid by: ☐ Check ☐ Cash

Contributor's Signature _____ Date _____

bnl auf

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.

The BNL Department of Nuclear Energy has several progams underway or planned for the U.S. Nuclear Regulatory Commission. These programs are in the general areas of probablistic risk assessment, nuclear waste management, and structural mechanics. Openings are available for persons with bachelor's, master's or docorate degrees and demonstrated capabilities in the following areas:

RELIABILITY ENGINEERING. Will work with event-tree analysis, fault-tree construction, and quantitative reliability methodologies. Work will include review of piping and instrumentation diagrams and will require prior experience in the operation/design of large mechanical equipment or instrumentation. Systems to be analyzed include engineered safety features, electrical systems and fluid systems (i.e., lubrication, cooling water, heating and ventilation). A background with nuclear power plant systems is desirable.

NUCLEAR WASTE MANAGEMENT. Applicant should have degree(s) in chemistry or materials science and a background for understanding the effect of geologic environments; properties of materials important in waste management; or chemical behavior of radioisotopes and material in which they are contained. These individuals will work with repository licensing and on regulations for the disposal of high- and low-level wastes. Specific tasks include waste package assessments, inventory of wastes, and recommendations for testing.

STRUCTURAL ENGINEERING. Applicant should have experience with finite element computer analysis techniques employed in seismic evaluations of large structural components (i.e., vessels, piping, pumps). A familiarity with piping systems analysis according to ASME Class 1, 2 and 3 is desirable. Experience with non-linear analysis of structures, together with a knowledge of ASME and RDT standards, is desirable. A background in mechanical and electrical equipment qualifications is also desirable.

Inquiries concerning these openings should be directed to Janet Whitehead, Ext 2872, or Marsha Kipperman, Ext. 2871.

SYSTEMS D/P ANALYST. Requires a bachelor's degree or significant relevant programming experience in COBOL. Required experience also includes systems design utilizing data base techniques. Knowledge of Hewlett Packard 3000 hardware is highly desirable. Responsibilities will include designing on-line financial applications. Management Information Systems Division.

Autos & Auto Supplies

69 RAMBLER - 6 cyl, std trans, good mpg. $300. Frank, Ext. 2290 or 475-5395.

SNOW TIRES - (2) A78-13 on Ford rims, excel tread, both for $29; snow tires H78-15, Sears Dynaglass, good cond. $5 ea. Al, Ext. 4216.

75 DODGE - Brougham sta wgn, 9 pass, loaded, very good cond, new valve and trans job. $1,500. Larry, Ext. 3935 or 727-1412.

72 DODGE COLT PARTS - R&L doors, glass, rad, alt, trans, also 1958 Ford truck wheels. 732-3338.

70 HONDA - custom motorcycle 450, red/white and blue print. $1,000. 924-6233.

RIMS - (2) 14" 5 hole from Plymouth Volare. $5 ea. Ext. 2493.

81 SUZUKI - GS650 Sport Faring rack, 5,000 mi, 55 mpg, like new. $2,400. Bill, Ext. 2422 or 724-6661 eves.

69 CHRYSLER - Town and Country wagon, engine very good. $125. Russ, Ext. 3059 or 744-7242.

78 HUSKY 250 CR - Moto-X, raced 1 season, lighting coil, excel enduro, accessories. Ext. 7696.

70 KARMANN GHIA - 83,000 mi, rebuilt eng. excel cond, stereo. $3,500. Sheryl, Ext. 5174.

BATTERIES - foreign, domestic, marine, industrial. J. Medina, Ext. 7636 or 924-6971.

72 PONTIAC CATALINA - p/s, p/b, a/c, rebuilt trans, excel cond. $800. Damian, 744-5079.

72 VW CAMPER - sleeps 4, fully equipped, excel cond. Leaving USA in Dec. $2,400. Ext. 3417 or 282-3126 home.

75 AMC SPORTABOUT - runs good, 50,000 mi; also snow plow, hydraulic lift angle, very good cond. Bob, 981-6092 after 5 p.m.

79 PLYMOUTH VOLARE - 4 dr, 6 cyl, a/t, a/c, p/s, p/b, 36,000 mi. $3,300. 499-8377.

RIMS - w/tires, fits 1977 Ford 150 pick up. $7 ea. Ext. 3514.

72 HD POLICE SPECIAL - 1200cc, all stock. $3,100. John, Ext. 4973 or 798-3766.

71 HORNET - fair cond, orig owner, 80,000 mi, 6 cyl 2 dr ht. Asking $450. Firm. Ext. 2529.

76 GRAND PRIX - a/c, p/s, p/b, p/locks, p/w, p/seats, fm stereo, w/walls, leather bucket seats, console. $3,500. 929-6031.

73 AMC HORNET - 66,700 mi, 8 cyl, excel cond, a/t, a/c, extras. $950. 585-6271 6 p.m. to 9 p.m.

80 FORD BRONCO XLT - a/t, V8, p/s, p/b, 9,000 mi, Dunlop radials, mint cond. Many extras. $8,700. Ext. 2192 or 473-1967.

77 CHEVY LONG VAN - 305 V8, a/t, a/c, p/s, p/b, cruise, am/fm cassette, 58,000 mi, loaded. $3,500. Ted, Ext. 4163 or 286-0065.

76 CHEVY VAN - orig owner, 6 cyl, stick, p/s, good, 79 K miles. $2,700. Weirshovsky, 757-5478.

78 FORD FUTURA - p/s, p/b, a/c, am/fm stereo, 21,000 mi, mint cond, good gas mileage. 473-1967.

71 MERCURY MARQUIS - p/s, a/c, excel cond in and out, 90,000 miles. $800. 581-7656.

79 GMC SIERRA - 1500 ½ ton pick up truck cap, insert, dual gas tanks, excel cond. Many extras. 475-0331.

73 VEGA - good running cond, low miles, 4 cyl, new engine, some rust, am/fm. $800. Sydell, Ext. 3389 or 666-2667.

70 FORD LTD - good running cond, p/s, p/b, a/c, new brakes. $300. Tom, Ext. 3703 or 286-1378 eves.

RIMS - 15" Ford, 2 for $5. Bill, Ext. 2906.

79 HARLEY DAVIDSON - Sportster XLCH, low mileage, excel cond, extras. $3,100. Wayne, 878-8459 eves after 6 p.m.

SNOW TIRES - (2) mounted A78-13, 4 stud, Pinto, etc. Best offer. Jim, Ext. 3501 or 751-0476.

RIMS - (2) 14" four bolt for Fords. $7 ea, 2 for $12. Bob Doering, Ext. 4474 or 4483.

PICK UP CAMPER - 11', Sunline, stove, oven, 3 way Ref., power converter, shower. Dave, Ext. 3365.

MOTORCYCLE - Honda Hawk, almost new. Asking $1,100. Al, 588-0805 eves.

72 PLYMOUTH DUSTER PARTS - windshield, $20; hood, $20; both doors, $25. Ray, 727-3608.

72 KAWASAKI - F7, 175 cc Enduros, 3 each, excel, good, parts $500, $200, $50; engine Toyota 3 RC, 1900 cc, profess rebuilt, less than 10,000 mi. $200. 265-1039.

73 VEGA GT - trans, rearend, front end, tires; 1966 Bronco engine transfer case; 1974 GMC P/U bed. 744-9892 after 6 p.m.

71 PLYMOUTH VALIANT - a/t, p/s, rad, new exhaust, brakes, shocks, excel engine, only 78K miles. $1,075. Jag, Ext. 5080 or 751-1884.

DYMO BARS - protect engine 1000 cc Suzuki shaft chrome. $20. Dan, 277-1284.

80 KAWASAKI KX125 - dirt bike, excel cond. $850. 477-0265 or 477-2269 after 5:30 p.m.

VEGA RIMS - (2) and snow tires, 13". Asking $25. Artie, Ext. 2697.

77 PACER - sta wgn, runs well, many extras, orig owner. $2,500. Ext. 2070 or 283-0223.

77 LONG BED - SR5 Toyota w/cap, very good cond. 475-5789 after 6 p.m.

77 KAWASAKI - KD 100 dirt bike, good shape. $300. 472-1473.

TIRES - 13" and 14" snows and regulars, 4 ply. $10 ea. Pete, Ext. 3516.

79 HONDA ELSINOR - 250 cc, like new, must sell. $1,000; 1962 Willys Utility Wagon, body completely restored, rebuilt flathead 6, 4x4. $1,800. 473-9180 after 4 p.m.

Boats & Marine Supplies

50 HP EVINRUDE ENGINE - 1975, good shape. $500. Tom, Ext. 7916.

LIFE RAFT - four man rubber raft, motor mount, wood seats. $60. Dave, Ext. 3365.

18' SHARPIE - fiberglass overwood, self bailing, deck, 5½' beam, good work boat. Must sell. 399-4725 after 6 p.m.

16' FIBERGLASS - ski barge w/all equipment for clamming. $1,000. 654-1945.

TRAILER TIRE - 5.70-8, 4 ply, range C, on 4 hole rim, brand new. Bill, Ext. 7772 or 281-0557.

16' ALUM FISHING BOAT - very seaworthy 40 hp elec. start Evinrude, mfg. tr. to fit. $1,000. 924-6751 eves.

CABIN CRUISER - 27' Owens, excel. cond, free winter storage. $2,500. Ext. 3698 or 288-3892.

Free

MALE RETRIEVER - mutt, 4 yrs. old, needs good, loving home. Neutered, trained, healthy. Bill, Ext., 2826.

FEMALE CAT - good home for 3 yr. old, spayed, healthy, friendly, gentle. Charlie, 878-1480.

Yard Sales

MOVING SALE - Nov. 14 & 15, furniture, household tools, all kinds of goodies. 21 Wychoff Ave. Pt. Jeff Sta.

GARAGE SALE - Sat. Nov. 14, 10 to 4 p.m., 8 Gerard St., Bellport. Household odds and ends, clothing.

CONTENTS OF HOME - living room set, kit., desk, many others. 758-9618.

GARAGE SALE - Nov. 14 & 15, 6 Cooper St., Shoreham, 1 block So. of Shoreham Middle School off Randall Rd.

CRAFT BAZAAR - Nov. 14, 10-4, Middle Island Firehouse, Holiday items, cakes, lunch.

Miscellaneous

LATCH HOOK KIT - Bucilla, 26"x40" Cornucopia, $20. Ext. 3431 or 744-9677.

GUN RACK - $6; anchor, $10; old wall mount wood clothes drying rack, $6. 475-4199.

STOVE - Calorie gas, white, 30", excel cond. $85. 929-4522.

DOLL HOUSE SHINGLES - hand split, redwood & pine. $2.75 bag, covers one sq. ft. Chris, 821-1704.

HAND MADE DOLLS - for XMAS gifts, $4. ea; antique grinder, $50; antique bathtub & sink, $100. Firm 732-3338.

BIKE - boy's Schwinn Sting-Ray. $35; girl scout uniform size 12-14. $12. 581-7656.

SNOW BLOWER - self propelled, 5 HP, 2 stage, elect. start, 24" chute, used once, showroom cond. $650. new, sell for $395. 878-1580.

BOY'S SUIT - size 18, 3 piece, navy, $10. 286-8521 after 5 p.m.

ATARI - electronic TV game, 6 cartridges. Ext. 7696.

1919 RCA ELECTRIC GRAMAPHONE - console needs electrical work. $250. 475-5415 after 7 p.m.

XMAS ORNAMENTS - individually hand crafted bread dough ornaments, Santas, angels, etc. Kathleen, Ext. 4216.

TV - color Quasar 19" portable. $100. Frank, Ext. 4312.

EARN EXTRA MONEY FOR XMAS - w/your own Ceramic Busines, Kiln w/hook ups, molds, paints, macrame supplies. Carol, 289-3917 after 3:30 p.m.

SKIS - poles, boots, size 9-10, $25; typewriter, portable, good cond. $20. Ext. 3514 or 265-1072.

AIR COND - GE, 2 yr. old, excel cond, EER=7.5, 115V, 14½ x 20½ x 13½", $100. Ext. 7547 or 7110.

INTO OAK? - Upright piano, excel cond; bikes for X-mas, 16&20" recon. better than new. $35 - $45. 581-6432 eves.

GE DISHWASHER - pot scrubber, portable, almost new. $150. or best offer. 751-6781.

PHOTOGS. - Ricoh Singlex 35mm outfit, complete w/zoom, extra lenses, strobes, filters, cords, etc; K&E slide rule & instructions, for students, professionals, etc. Best offer. Gordon, Ext. 7772.

CITRUS FRUIT - pink grapefruit; juice, tangelo & navel oranges, $7 - $9/box. Delivery Dec. 14. G. Price, Ext. 3336.

MAGNUS ORGAN - w/bench; Kay guitar, electric guitar, v.g. cond; aluminum storm doors. Kelly, 744-3069.

CHILD'S ROCKING CHAIR - $5; coal stove, used one season, $900 + new, sell for $600. 286-0422 after 6 p.m.

FENDER RHODES PIANO - excel cond. $500. Ext. 3698 or 288-3892.

TV - 19" Motorola, portable color, needs some work. $60. Ext. 2335 or 878-4506 after 5:30 p.m.

WOOD GARAGE DOOR - springs, runners, all hardware. $50. 369-1134.

KITCHEN RANGE - oil burners/electric, any reasonable offer; chairs upholstered w/slipcovers. $75. pair. 325-1961.

WASHER & DRYER - both in good working order, Kenmore washer & GE220 Volt dryer (white) $100. ea. Terry, Ext. 3284 or 281-0360.

FORMICA TABLE - 4 chrome chairs, $30. Olson, Ext. 4278.

BATHROOM SINK - w/faucet, white, good cond, $5; brush axe, new $10. Walter, Ext. 3397 or 567-9025.

GOLF BAGS - ladies & mens, like new, $10. ea; plant light, fluorescent on stand, $5; patio door 5 ft. wide, $50. Mike, 878-4128.

PONY SADDLE - w/blankets, in good cond. Best offer. Ext. 3217.

DISHES - Mikasa service for 8, plus extra pieces, blue/green pattern, excel. $50. Ext. 5274 or 281-2767 eves.

COAL STOVE - Atlanta laundry stove, excel cond. $80. 727-7741.

PEAVEY BASS AMP - 2 piece unit, v.g. cond. 878-1688 eves.

BOWLING BALL - w/bag, 16 lb. excel cond. $15. Joe, Ext. 2575.

FREEZER - 15.4 cu. ft. upright; dishwasher; alto saxophone; all in excel cond. Don, Ext. 2225.

HUTCH - $75; weathershield stroller, $12; girl's size 12 coat, $10; woman's size 5/7 clothes; wok, $6. 399-2286.

RECLINING CHAIR - green leather, $25; rug 9x12 pink, $15; motorcycle helmet, full face Med, new, $75; piano "Knabe console" $300; Bundy trombone, $125; digital tape calculator Unisonic, $25. Ron, Ext. 7101 or 289-1003.

QUALITY TAPE CASSETTES - C-90 Ferrike CrO2 & FeCr tapes, $2.75 ea. Ext. 2521 or 928-8379 eves.

TV - Zenith 23" console, needs a few tubes. Ron, Ext. 2621 or 744-8334 after 6 p.m.

DESK CHAIR - tan leather, swivel & tilt, excel cond. $20. Azzara, Ext. 4758.

KITCHEN TABLE - w/leaf, 2 chairs. $30. 744-9822 after 6 p.m.

UNICEF 1981 CHRISTMAS CARDS - gifts, stationery, for Catalogs & order call Ext. 4959.

TOPCOAT - boy's all weather w/zip-out liner, size 10, like new. $9; assorted scientific books, mostly astronomy & math, good to excel cond, reasonable prices. Fran, 286-0958.

TV - 12" B&W, $25; Sunbeam mixmaster, $15; electric print dryer, $7. Irv Meyer, 929-4326.

SLINGERLAND DRUM SET - 5 piece, Zildjian cymbals, w/cases, extra hardware, excel. $600. Dana, 472-2394 after 8 p.m.

DOLL HOUSE - Victorian Manor w/Carr house, sided, painted, $200; homemade chocolate special Thanksgiving & Christmas orders. 744-1292.

TRICYCLE - $20; assorted 8 track tapes, $2. ea; porta-crib, $8; modern chair, chrome w/black vinyl, $40. George, Ext. 4460.

AIR HOCKEY - large, sturdy, good cond. $40. Ray, 589-3485.

MAPLE SAPLINGS - 4 ft. $5. ea; Colpak pad, Cervical traction unit for whiplash injury; box spring & foam rubber mattress, single bed; large carton Xmas ornaments & lights; 3 albums Swing records. 281-2002 after 3 p.m.

BEDROOM SET - Sugar Hill pine, queen bed, double dresser, 2 night tables, armoire. $1,500. 698-7213 after 5 or ask for Dave at Ext. 7764.

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

REMSENBURG - 3 bdrm, fp, jacuzzi, low tax, financing avail, $100,000. Ext. 3698 or 288-3892.

HAUPPAUGE - immac. 3 bdrm L-shaped ranch on corner lot, eik, l/r, d/r, den w/fp, S/S, w/w carpeting, 2 baths, bsmt, patio, many extras. Near LIE, schools. Assumable 7½% mortgage. 979-0252.

MASTIC BEACH - 4 bdrm Cape, eik, d/r, 160x100 prop, low taxes, gas hot water & cooking, elec. heat, l/r, w/wood burner, existing 8½% Farmers Mortgage. $28,000. 281-0360 after 6 p.m.

For Rent

BELLE TERRE - secluded woods, 3 bdrms, 2 baths, renovated 1980, $800/mo. Avail. Jan 15th. 928-0281, 7:00 p.m., after Nov. 15th.

SHIRLEY - furnished 3 bdrm house, full bsmt, garage, dishwasher, freezer, refrig, oil hot water heat, on wooded acre 8 miles from Lab. From Jan. 1982 to Jan. 1983. Ext. 3618.

STONY BROOK - 4 bdrm, 2½ bath, l/r, d/r, f/r, Colonial, 2 car garage, all appliances, partially furnished, walk to Univ. $700/mo. + util. Ext. 4273.

VERMONT - hike, loaf, XC or downhill ski, Cape Cod, fully equipped, 3 bdrm, 2 baths, fp, garage, reasonable. 732-6499 after 6 p.m.

PT. JEFFERSON VILLAGE - spacious 2 bdrm unfurnished apartment for $480/mo. + Security (heating incl). Peter, Ext. 2744/7647 or 928-2469 eves.

MASTIC BEACH - 4 bdrm Cape, eik, l/r, d/r, porch & shed, large prop, walk to stores, 10 min. to Lab. $350/mo. (1 mo. Security). Terry, 281-0360 or Ext. 3284.

ROCKY POINT - 9 miles from Lab, 4 bdrm Cape Cod, washer/dryer, available for immediate occupancy. 744-7083 after 6 p.m.

VERMONT CHALET - near Bromley, Stratton & Magic Mtns, XC adjacent to chalet, beautifully furnished, stone fp, rent: wkends, wks & partial seasons. 757-5599 after 4 p.m.

ROCKY POINT - immaculate 2 bdrm, cottage, eik, l/r, full bath w/tub, elec. heat, quiet cul-de-sac, storage shed. $290/mo. + util. Ext. 7108.

YAPHANK - Colonial Woods Condo, very attractive, 2 lg. bdrms, fin. bsmt, all appl, ac, pool, tennis courts, close to Lab. Ext. 7166 or 924-5214 after 3 p.m.

Car Pools

BABYLON/WEST ISLIP - driver needed. Ext. 2493.

PATCHOGUE/LIRR STATION - ride wanted every Monday to BNL (8:10 train arrival). Jim, Ext. 3372.

CORAM - Village in the Woods or Birchwood at Bretton Woods. J. Adams, Ext. 4994 or 732-5641.

COMMACK ROAD/EXIT 52 LIE - Park and Ride, additional drivers, existing car pool from 8:30 to 5:00. F. Ferraro, B. Peterson, Ext. 3284.

HAMPTON BAYS - wish to join or start car pool. Ganu, Ext. 3373.

FROM PATCHOGUE VIA BELLPORT - 9 yr. old car pool, on-time, has vacancy for paying rider. Alyce, Ext. 2901.

Lost & Found

LOST - one wire wheel hub cap, reward offered. Linda, Ext. 3632.

Wanted

CLEANING WOMAN - reliable, thorough worker. 286-8521 after 5 p.m.

FENTONWARE THUMBPRINT GLASSES - dishes, all sizes, colors. Any amount. Karl, Ext. 4192 or 744-2461 after 5 p.m.

STROLEE - baby car seat. Les, Ext. 5180.

SEWING MACHINE - electric zig-zag. W. Eberhardt, Ext. 3705 or 878-8451.

BABY SWING - for wooden swing set. 751-6781.

REEL LAWN MOWER - (powered) in working cond. Ext. 3890 or 924-4250.

EXPERIENCED ENGLISH RIDER - to share half board in return for riding. Thoroughbred, 15.3 hands, indoor arena in Middle Island, Ray, Ext. 2023 or 399-4767.

PEOPLE INTERESTED - in skiing wkend of Jan. 29th or Feb. 26th. For info call Bea, Ext. 3571.

UTILITY TRAILER - 4x6'-8' for medium hauling. Cleve, Ext. 4483 or 924-0092.

SKI GORE MT. - Jan. 29 - 31st, chartered bus, interested? Call Sue Norton, Ext. 2050 or Wally Hughes, Ext. 4670.

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

MATURE PERSON - to care for 3 young children, 2-3 days/wk, our home, prefer own transp. Ext. 3578 or 878-4864.

PIANO - for beginner. Reasonable. 289-1955 after 5 p.m.

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

RIDING MOWER - for church use. Reasonable. 281-2002 after 3 p.m.

INSTRUCTION MANUAL - for Pentex S-1 camera, to buy, or borrow for copying. Tony, Ext. 3293, noons or after 5 p.m.

ENCYCLOPEDIA - recent edition, good cond. Henry, Ext. 7913 or 724-6497.

GARAGE/STORAGE SPACE - in safe location for household goods. Muthu, Ext. 3060 or 3076 eves.

2 BDRM HOUSE - or apt., Riverhead area, reasonable please. Ext. 7991 or 369-2783 after 6 p.m.

Services

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

BOOKS FOR HOLIDAY GIVING - children and adult selections, Upton Nursery School Book Fair, Dec. 1, 2 and 3.

CHEESECAKES - quiches, apple streusel and pecan pies, make your holiday order now. 821-1039.

BABY SITTING - responsible male H.S. student, in Bellport area. 286-3742 eves, wkends.

RESPONSIBLE MOTHER - will care for your child in my home, fenced yard, playmate, lunches. Weekdays. 286-0834.

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