BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Willy Higinbotham on the cover of Video and Arcade Games magazine.

Wolf and Goldhaber Honored

Today, at the University of Uppsala in Sweden, the degree of Doctor of Science *honoris causa* is being conferred on Alfred P. Wolf, Chairman of the Chemistry Department.

In a letter informing Wolf of the award, Professor Göran Bergson, of the University's Chemistry Division of the Faculty of Science, wrote that he and his colleague Bengt Långström had nominated Wolf for the degree "in recognition of your pioneer work in hot-atom chemistry and the synthesis of organic compounds labelled with short-lived radionuclides."

Uppsala, the oldest and most important university in Sweden, bestows only a few honorary degrees each year. "So it is a big honor," said Wolf, who called his being chosen for the award "a most pleasant surprise."

At present, one of Wolf's research interests revolves around PETT VI, an instrument for conducting positron emission transaxial tomography, and the two Chemistry Department cyclotrons. Wolf is principal investigator for a major study of metabolism and neuroscience which uses PETT VI and is being carried out by the Chemistry and Medical Departments. In addition, he is involved in a basic research program in chemistry unrelated to the PETT work.

Wolf, a senior chemist, has been a member of the Chemistry Department since he came to BNL in 1951. He assumed the department's chairmanship in 1982. Wolf has become internationally known for the scientic research he has conducted here.His contributions to his field were previously recognized in 1971, when he received the American Chemical Society Award in Nuclear Applications in Chemistry, and in 1981, when he was the recipient of the Society of Nuclear Medicine's Paul C. Aebersold Award for outstanding achievement in basic science applied to nuclear medicine.

Alfred P. Wolf

Maurice Goldhaber, AUI Distinguished Scientist, received an honorary doctorate of science at the 23rd commencement of the State University of New York at Stony Brook on May 22. His citation reads "Your distinguished career in experimental physics began auspiciously when, even before the great Fermi, you used neutrons to study nuclear reactions. Today you are a major collaborator in the ongoing experiments on proton decay. In all your work in physics, you have displayed a rare combination of physical insight and experimental ingenuity. As a scientist and as an organizer of science, you are unexcelled." With Dr. Goldhaber above is Jeanne Thayer, a trustee of SUNY who conferred the degree.

— HSC Photography Service

Our Bet's On Willy!

His face is on the cover of a magazine. A public radio network broadcasts an interview with him. Why is Willy Higinbotham getting all the publicity? Let's back up to March 13, 1981. That was the day the Brookhaven Bulletin published a story on Higinbotham, speculating that he may have invented the first video game, with his tennis game of 1958.

Creative Computing magazine picked up on the idea and published an article by John Anderson in October 1982, crediting Higinbotham as the inventor, that is, until they heard from someone who could document an earlier game.

The same Anderson story was reprinted in the Spring 1983 issue of Video and Arcade Games, a sister magazine to Creative Computing. To date, no one who has contacted the magazine has been able to prove an earlier claim.

For those of you who don't know Higinbotham's story, here is a recap. He designed the game as entertainment for visitors' days at BNL. In the 1950s, most of the exhibits were static displays. Higinbotham, who was then head of the Instrumentation Division, says it occurred to him that "it might liven up the place to have a game that people could play, and which would convey the message that our scientific endeavors have relevance for society."

The division had a small analogue computer that contained ten direct-connected operational amplifiers. The computer's instruction book described how to generate various curves on the cathode-ray tube of an oscilloscope, using resistors, capacitors and relays. Among the examples were the trajectory of a bullet subject to gravity and wind resistance, ICBM trajectories and a bouncing ball. The bouncing ball inspired Higinbotham to design a tennis game. Four of the operational amplifiers were used to generate the ball motions and the others to sense when the ball hit the ground or the net, and to switch the controls to the person in whose court the ball was located.

A two-dimensional, side view of a tennis court was displayed on an oscilloscope, which has a cathode-ray tube similar to a black and white TV tube. In order to generate the court and net lines and the ball, it was necessary to time-share these functions. While the rest of the system used vacuum tubes and relays, the time-sharing circuit and the fast switches used transistors, which by 1958 were coming into use.

Tennis for two was part of the division's exhibit for two years, and it turned out to be a real crowd pleaser. The oscilloscope display in 1958 was only five inches in diameter. The next year saw some improvements: a bigger tube ten or 15 inches in diameter was used, and players had a choice of tennis on the moon, with low gravity, or on Jupiter, with high gravity.

Considering Higinbotham's background, his invention of the game in 1958 was a natural outgrowth of his schooling and work experience. During his senior year at Williams College, he used an oscilloscope to reproduce a system to display the audio modulation of a radio station's high frequency radio output.

At Cornell's physics department as a graduate student, he worked as a general purpose technician, learning the new and rapidly developing field of electronics.

When he joined the staff of the MIT Radiation Laboratory in 1940, he worked on cathode-ray tube displays for airborne, shipborne and land-based radars. This involved designing a way to display the echos returned from distant targets, similar to the problems involved in the tennis game display.

Later, he worked on the Eagle radar display system, which showed the radar returns of ground targets as seen from a high flying B-28. The picture of the target area stood still on the display, in spite of the yaw, pitch or roll of the aircraft while maneuvering toward the target. This work led to patents for inventing circuits using operational amplifiers like those in the analogue computer which was used in the tennis game.

All in all, then, when Higinbotham designed his video game, he incorporated much of what he had done before. As he recalls, it took him about two hours to lay out the design and a couple of days to fill it in with components on hand. Technician Bob Dvorak put it together in about three weeks, and the two of them took a day or two to debug it.

Was Higinbotham's game the first? Unofficially, it appears so. Here is what Higinbotham knows about the legal side of that question. Sanders Associates applied for the first video game patent in 1964. The patent was purchased by Magnavox, which put out the first simple game in 1971. Magnavox sued all other entrants to the field.

About 1976 a competitor's lawyer found David Ahl, who had been a high school visitor to the Lab in 1958. Ahl, now publisher and editor-in-chief of Creative Computing magazine, had written in his book, Basic Computer Games, that he had played an early video game in 1958 at Brookhaven Lab.

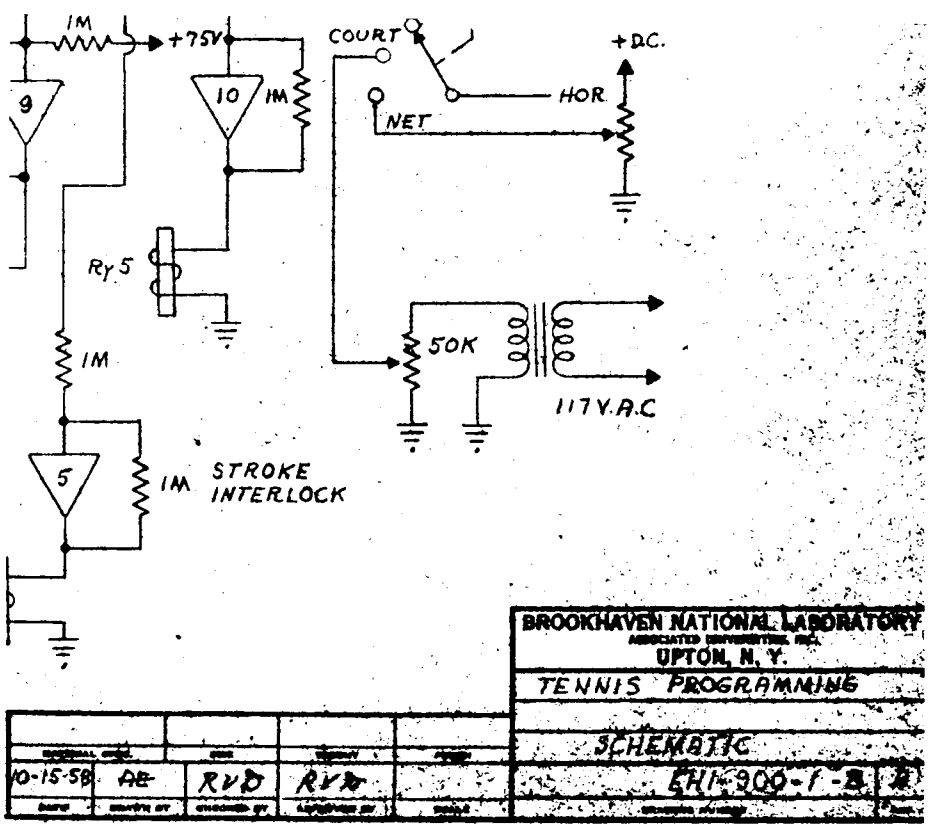
(Continued on page 2)

Doug Humphrey

Tetsuji Nishikawa (left), Director General of KEK in Japan, and James Leiss, Director of the DOE Office of High Energy Physics, shake hands after signing the fifth high energy physics cooperative research agreement. The signing culminated a meeting of the Japan/U.S. Committee on High Energy Physics, held May 24-25 at BNL. U.S. members of the Committee attending the meeting were Earl Hyde, Deputy Director, Lawrence Berkeley; Leon Lederman, Director, Fermi; Wolfgang Panofsky, Director, SLAC; Nicholas Samios, Brookhaven Lab Director; and Jack Sandweiss, Professor at Yale University. The Committee heard reports from physicists representing cooperative experiments and research and development programs across the U.S. Also on the agenda was a tour of the neutrino experiment at the AGS, a major cooperative effort jointly funded by Japan and the U.S. Department of Energy.

Doug Humphrey

BNL's Combustion Sciences Division, DAS, hosted a three-day conference on combustion research May 24-26. Among the participants were (from left) Allan Laufer, Technical Manager of Chemical Physics Programs, DOE; Professor Frederick Kaufman, University of Pittsburgh; Joe Michael and Bruce Klemm, BNL; and Richard Kandel, Branch Chief, Fundamental Interactions, DOE. Organized by Klemm and Michael, the conference was attended by more than 80 researchers from all over the U.S. who came to exchange information and ideas and to discuss the progress of their work. The combustion research program is funded by DOE's Office of Basic Energy Sciences and emphasizes basic chemical physics research in the areas of: detection and measurement of reactive species; elementary combustion reaction kinetics and mechanisms; and chemical reaction rate theory. Also included is research in the fields of gas dynamics and computer modelling of chemical reactions. Supported under this program are projects at about 25 universities, the National Bureau of Standards, Argonne National Lab, Sandia National Lab and BNL. The conference was dedicated to the memory of Dr. O. William Adams, who managed the DOE combustion research program nearly from its inception until his sudden death last October.



A section of the blueprint of the original tennis game designed in 1958 by Higinbotham.

TID-Bits

In a previous column (January 21, 1983), we highlighted the major shifting operation going on at the Research Library (477A) and in our Annex (184). That work is now complete.

About half the periodical collection is located in the Annex across from the Research Library, and consists mainly of older volumes of titles carried in the main periodical collection. More recent materials are located in the Research Library. Both collections have the same hours and both facilities have photocopiers. Title-to-stack guides direct you to the appropriate stack. In addition, title guides appear on the stack ends in the Research Library.

We're pleased to announce that the book shifting is also complete and stacks are labelled to show their ranges. The Research Library main book collection is located on the east end of the stack area, adjacent to the Circulation Desk. Special collections (Reference, Ready Reference, Information Science, General Science, Abstracts) are located in various areas of the main reading area, all appropriately labelled.

During the summer we are going to reconstruct several areas related to Technical Services to increase our efficiency. At the same time we will move our online reference center to the main reading area. There should be only limited effect on services.

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The Research Library has begun a special collection of the House Committee on Science and Technology hearings and reports. Titles include "The Future of the DOE's Multiprogram Laboratories," "Symposium on Minorities and Women in Science and Technology," and "Impacts of Budget Uncertainties on DOE's National Laboratories." For further information, contact Judy Liu, Ext. 4926.

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Any matters concerning libraries at BNL should be brought to the attention of the departmental librarians, members of the Research Library staff, or one of the following members of the Research Library Advisory Committee:

Name	Dept.	Ext.
Norm Holden	NNDC	5083
Sam Krinsky	NSLS	4740
Ed DerMateosian	Physics	3904
Don Metz	DAS	3054
Ed Popenoe	Medical	3622
Yoshio Shimamoto	AMD	4186
Bill Siegelman, Chr.	Biology	3417
Gene Weinstock	DNE	2943
Pete Yamin	Accel.	4838

—Ken Ryan, Manager
Technical Information Division

Library Policy

The Research Library and Annex are open until around 10 p.m. weekdays and weekends, except on BNL Tour Sundays, June through September. The Library has the following circulation policy:

- All BNL employees, as well as visiting scientists and other users with special permission, may borrow materials from the Research Library.
- Library users may borrow as many books at one time as needed.
- Loan periods are as follows:

Books & Reports may be borrowed for four weeks and are renewable twice. In cases of need, a six-month extended loan period can be arranged with Circulation (renewable at the discretion of the Library).

Reference materials and standard abstracts and indexes do not circulate.

Journals (both bound and unbound) will circulate overnight only. They are not renewable.

- Overdue notices will be sent as reminders. Items on loan are subject to recall after two weeks if requested by another patron. Any material no longer in use should be returned to the Library.
- Terminating employees must return all outstanding materials to the Research Library. Check-out sheets will be signed only after Library material has been returned.

Questions about Research Library policies may be directed to Marilyn Galli, Ext. 3485.

Clip and Save

Video Game (Cont'd)

The lawyer tracked down Higinbotham, who has blueprints of the game to prove its date of creation. Other lawyers followed.

Says Higinbotham, "In 1981 one lawyer determined to break the Magnavox patent. In February 1982, I made a deposition in this lawyer's office, before the Magnavox lawyers and others. In June, David Potter, Seymour Rankowitz and I were scheduled to testify at a trial in Chicago to break the Magnavox patent. At the last moment the case was settled out of court."

Higinbotham says his children and friends have asked him why he didn't patent his game. After all, he had patented other inventions, most notably the "bootstrap" sawtooth generator widely used in oscilloscopes, and the Higinbotham Scaler, which made it possible to count reliably and electronically random pulses from radiation detectors at high rates.

In restrospect, Higinbotham agrees he should have applied for a patent. But if he had, the patent would have belonged to the Federal government, and no riches would have come his way, anyway. The reason he did not apply, was that at the time, it didn't seem to be any more novel than the bouncing ball circuit in the instruction book.

Even now, video games don't interest him. "I play very seldom," he says. "When I do, it's usually against my daughter, who is a wiz, and I always lose. Pinball is more my game."

—Mona S. Rowe

Service Awards

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

Thirty-Five Years

Bernard Lattanzio ..... Plant Engrg.
Roland Sick ..... Applied Science

Thirty Years

Albert P. Schlafke ..... Accelerator

Twenty-Five Years

Kenneth H. Johnson ..... Plant Engrg.
Eugene W. Rogers ..... Accelerator

Twenty Years

David S. Johnstone ..... Plant Engrg.
Ronald F. Peierls ..... Applied Math.
Helga Pirozzi ..... P&GA
John H. Weinmann ..... Accelerator

Ten Years

Elinor Adams ..... AUI
Carl R. Gardner ..... Central Shops

Speakers Bureau

Paul Kessler (Math), **Michael Losquadro** (Math); Smithtown Rotary Club/Boy Scout's of America Career Day, Careers in Computers, May 12.

Michael Creutz (Physics); Nassau Science Explorations, Elementary Particles, May 17.

Irvin Meyer (Chem.); Suffolk Science Explorations, Glass and Glassblowing, May 23.

Robert Glasmann (Accel.); Long Island Science Congress, Science Fair Judge, May 24.

Eva Bozoki (NSLS), Martin Leach (DEE); Career Day at Ward Melville High School, Careers for Women in Science, Careers in Meteorology, May 25.

Edward Murphy (PE); Medford-North Patchogue Lions Club, Home Energy Conservation, May 26.

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BERNICE PETERSEN, Editor
MONA S. ROWE, Assistant Editor
ANITA COHEN, Reporter

35 BROOKHAVEN AVE., UPTON, N.Y. 11973
Telephone (516)282-2345

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to New York City on Wednesday, June 15. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $3.50; children under five years ride free.

Reserve a ticket by sending your fare through the U.S. mail to Hospitality Committee, P.O. Box 322, Upton, New York 11973. Please do not send cash. Checks or money orders, payable to BNL, must be received by Thursday, June 9. Put the date of the trip, your BNL life number and your phone number on the back of the check or money order. Tickets will be given to you at the railroad station on the day of the trip. Refunds will be made only if cancellations are received by the Monday morning preceding the trip.

Hospitality News

The Hospitality Committee's next morning get-together will be on Tuesday, June 14, from 9:30 to 11:30 a.m. at the Brookhaven Center. Wives of employees, guests and visitors to the Laboratory are welcome. Coffee, tea and danish will be served. Please come and bring the children. Babysitting will be provided free of charge.

Betty Mazzarella has made arrangements for a group to tour the historic William Floyd Mansion that day. If you are interested in taking the tour, she will fill you in on the details at the morning get-together.

To celebrate the end of another run, all those involved with AGS Experiment 748 gathered recently to "get polarized" at the second annual Polarized Spring Party. The festivities were dubbed "a spin-off of E-748" because that experiment is devoted to studying the interactions of high energy protons with a polarized proton target, where most of the protons spin in the same direction. In addition to a repeat of last year's hit, "Pin the Spin on the Proton," party-goers competed in a "Polarized Jump Rope Contest." In this photo, physicist Bill Weng takes his turn.

Reminder

The deadline for enrolling in the Dental Assistance Plan has been extended to June 10. If you do not join now, the next chance to participate will be January 1, 1985.

Retirement Notes

Sun City, Arizona....Orange, California....Venus, Florida....Chatham, Massachusetts....Lakehurst, New Jersey....Warwick, Rhode Island.... Reston, Virginia....Redmond, Washington....as diverse as these cities may be, they all have one thing in common. Each is home to at least one retired BNL employee.

But most Lab retirees and those on long-term leave are living in places with more familiar names: Bayport... Bellport...Calverton...Greenport... Islip...Massapequa...Medford...Shoreham....about 75% have elected to stay here on Long Island.

One of those is Ray Abbott, who was the subject of a feature article in a recent issue of Popular Photography. While a technician at BNL, Abbott used photography as an investigative tool for the Accelerator Department. Since he left the Lab in 1972, he has shared his photographic expertise with amateurs interested in learning color printing. As the article said, "Whether it's a local Boy's Club, library, or camera club, Ray is always ready to teach a course, lecture for an evening, or simply answer questions." Abbott, who lives in Bayport with his wife Rose, returns to BNL periodically to work with the Camera Club.

Other former BNL'ers have found completely new interests. A good example is Claire Hull, formerly a principal office services assistant in the Medical Department. Hull, who retired in 1980 and lives in Mastic, wrote, "I am presently Chairman of a unique group of retired men and women which calls itself the Center for Creative Retirement. We meet at Southampton College in the Ocean View Lounge three times a week, Monday, Tuesday and Thursday. We study 12 subjects each semester. These courses are researched and presented mainly by ourselves, but we try to be as professional as possible. At times we are fortunate enough to have professors at the college, or knowledgable outsiders, who come and speak to us. This is our second year, and we all feel that our lives are greatly enriched by this center."

Carl Wingard, a Patchogue resident, has also become involved in education. Wingard retired from his position as a storeskeeper in Supply & Materiel in 1977, and, as his wife Norma wrote, "...a few months later, I became an insulin dependent diabetic. Because of this my husband tried to find out all he could about diabetes. He attended classes taught at the Brookhaven Memorial Hospital for 25 hours. He took and passed the final tests and became a regular volunteer in patient education in diabetes. He spends every Tuesday and Friday afternoon at the hospital visiting the diabetic patients, answering their questions and helping them in any way that he can. He was presented with a 1000 hour pin in February. I am very proud of him and his interest in helping others."

John Semkus of Sag Harbor also owes his new career to his wife (Hattie). Semkus used to work as a production and planning coordinator in Central Shops, but things have changed. In response to our March notice asking what former BNL'ers are up to, Semkus sent the Bulletin the cartoon printed here, with the notation, "My wife works!!"

Stephen Waski and his wife Dorothy are enjoying their retirement in Spring Hill, Florida. Waski, who retired in 1978 was a motor vehicle maintenance supervisor in Staff Services. He wrote, "We are fortunate here in beautiful Spring Hill to have several other former employees: Ed Szczepanik, Walt Geisbusch, Bob Gaffga, Adam Paskiewicz, and several in near areas." When not socializing with other former colleagues, Waski enjoys gardening. "I recently had a new home built on a ¾-acre plot," wrote Waski. "It is country here and I have a large garden which is very productive. My greatest pleasure is waking up each day and getting out to work."

"We're conducting a survey to find out how many people are enjoying their retirement."

Martin Van Lith is farming on a larger scale. On their 30 acres outside of Pittsboro, North Carolina, Van Lith, who retired five years ago from his position as general communications clerk for Staff Services, now devotes his time to the care of his livestock (usually 12 head of beef cattle and one goat named Billy) and his poultry (about 35 assorted chickens and ducks). His wife Marie prefers to garden and started the seedlings for her 70'×170' plot back in February, in the 200 square foot greenhouse Van Lith built for her over the winter. With its pleasant climate and low taxes, Van Lith finds North Carolina the perfect retirement site. And he said, "Because we stay in touch with BNL through the Bulletin, we've never felt like we're very far away."

Note to retirees: Now that you know what some of your former co-workers are up to, how about you? Send a short description of your current activities to the Bulletin, Bldg. 134, BNL, Upton, N.Y. 11973.

Diners Note

The Cafeteria will be closed on Saturday, June 4. On that day, snack bar service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

Cafeteria Menu

Week Ending June 10, 1983

Monday, June 6		
Cream of tomato soup	(cup)	.65
	(bowl)	.75
Cheese omelet & 1 veg.		1.80
Kielbasa & sauerkraut		1.90
Hot Deli — Corned beef	(bread)	1.85
	(roll)	1.95
Tuesday, June 7		
Old fashioned bean soup	(cup)	.65
	(bowl)	.75
Savory baked chicken quarter & 1 veg.		1.95
Chinese pepper steak on rice		1.95
Hot Deli — Pastrami Reuben		1.90
Wednesday, June 8		
Minestrone soup	(cup)	.65
	(bowl)	.75
Baked meatloaf w/mushroom gravy & 1 veg.		1.85
Sauerbraten & potato pancake		2.00
Hot Deli — BBQ fresh ham	(bread)	1.85
	(roll)	1.95
Thursday, June 9		
Turkey okra Creole	(cup)	.65
	(bowl)	.75
Stuffed pepper & 1 veg.		1.85
or w/spaghetti		2.05
Turkey á la king on rice		1.85
Hot Deli — Top round of beef	(bread)	1.95
	(roll)	2.05
Friday, June 10		
Fish chowder	(cup)	.65
	(bowl)	.75
Fish & chips		1.85
Ham & potato au gratin w/1 veg.		1.85
Hot Deli — Swedish meatball hero		1.95

Arrivals & Departures

Arrivals

Michael J. DiGregorio .... Accelerator
Michael C. Fazio ..... Accelerator

Departures

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

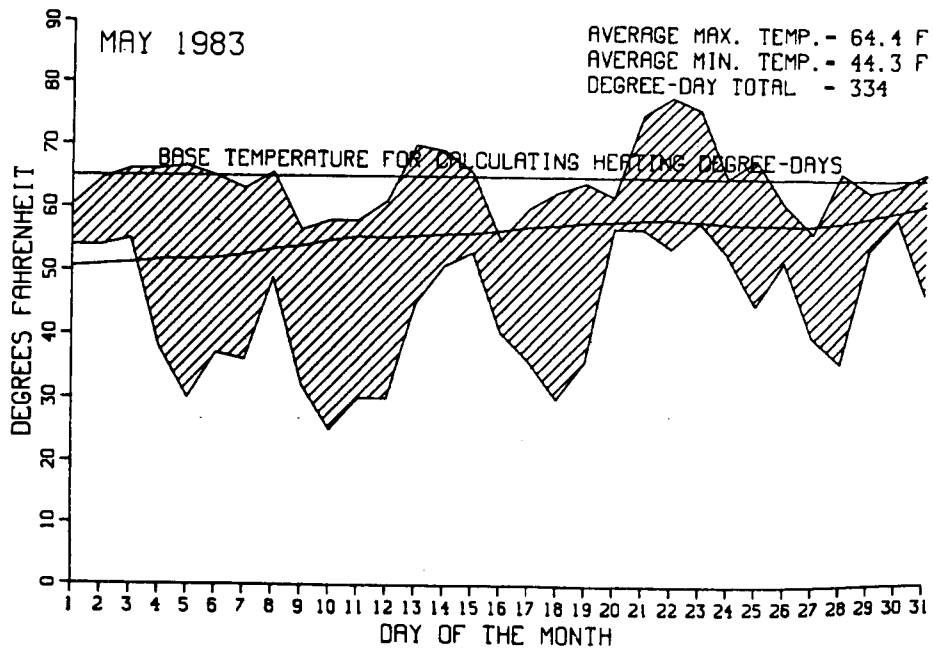
Dorothy M. Dioguardo ..... Medical
Vishwas S. Ganu ..... Biology
Anna Kissel ..... Director's Ofc.
Julio Vidal ..... Appl. Science

Mountain Club

The Mountain and Canoe Club will meet on Wednesday, June 8, at 5:30 p.m. on the patio of the Brookhaven Center (in the lobby if it rains). Summer trips will be discussed. All who are interested in participating are welcome to attend.

Fairway: the well-kept and seldom used portion of a golf course.

BNL Degree Days



According to Meteorology's records, last month was the coldest May since 1971. In fact, with a total of 334 degree days, May '83 was a lot colder than May '82, which had 206 degree days. Here's another interesting statistic: 32.48 inches of rain fell during the first five months of this year, compared to 20.63 inches for the same period last year. (Average yearly rainfall since 1949 is 48.07 inches.)

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.

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

1883. TECHNICAL POSITION - Requires AAS degree in electronic technology or equivalent with 5 years' experience in digital circuitry. Under minimum supervision, will layout, construct, install and troubleshoot electronic and electrical control systems used in the testing of superconducting magnets. Accelerator Department/CBA.

Autos & Auto Supplies

77 CHEVY CAMARO - $3,300. Jeanne, Ext. 7125.

GOODYEAR BELTED TIRES - A70-13, 2 v.g.; 2 slightly worn. Frank, Ext. 4581

72 OLDS DELTA 88 - $600 (neg.). Mark Ext. 5176

80 TOYOTA CELICA - Oscar, Ext. 3499 or 325-9580 after 6 p.m.

72 PLYM. WAGON - $450. 821-0692 after 6 p.m.

74 FORD GALAXY - Joe, Ext. 4661.

RIMS - (2) for 15" Volvo tires, $30. Bill, Ext. 3369 or 929-6442 after 6 p.m.

78 POSCHE - 33,000, $9,000. Steven 212-358-5705.

76 DATSUN B-210 - $900. Richard, 286-3235.

78 DODGE ASPEN WAGON - $2,400. Ed., Ext. 2897 or 472-1734.

71 TOYOTA COROLLA 1600 - '78 eng. w/50,000. $350. Robert, Ext. 4745.

EMERG. FUSE KIT - for British auto's i.e., Austin Healey Triumph. Sue, Ext. 4267

79 HONDA DIRT BIKE - 50cc. $240. Arlene, Ext. 3604 or 878-0516 after 6 p.m.

80 HONDA HAWK - Sport model CB400T. $895. 286-8814 after 5:30 p.m.

79 MERC BOBCAT - Brian/Nancy, 924-4680.

76 FORD GRANADA - $1,600. Peter, 924-3281 (early a.m./late p.m.)

VW PARTS - Brand new, call for needs. Augie, Ext. 2419 or 289-4211 eves.

72 HONDA MOTORCYCLE FRAME - 750cc, many extra parts. 654-2076.

73 VW AUTO TRANSMISSION - Complete, $100. Toni, Ext. 2907 or 289-4211.

75 SAAB 99LE PARTS - $500. John, 399-2434.

79 TOYOTA PICKUP SR5 - Long bed cap. R.K. Stoehr, Ext. 4291 or 363-8981.

79 YAMAHA 650 SPECIAL - $1,700. Kathy, 929-6421.

73 PORSCHE - Rick, Ext. 3979.

71 VOLVO 164 - Bob, Ext. 2144.

77 CADILLAC COUPE DEVILLE - Gary, Ext. 2350 or 567-9617.

2 SMALL BLOCK — Chevy short blocks, both apart & need work. $50. ea. Bill S., Ext. 4434 or 399-6168.

80 CHEVY C-20 CUSTOM PICKUP - $4,980. 588-6770, after 5 p.m. 585-4126.

CRANE CAM S.B. CHEVY - 516-539 lift, $30; H.D. Balancer Degreed $50. Bill, Ext. 4434.

MANLEY PISTONS - 327+030 .043 rings, $150.; Alum. super rods w/l.w. pins $100. Bill, Ext. 4434 or 399-6168.

79 HONDA MOTOCYCLE - CM400T. $1,000. Jean, Ext. 7125.

75 PLYM VALIANT - $1,200. Rich, Ext. 4134.

78 HONDA - 550cc. $1,200 firm. George, Ext. 7654.

78 MUSTANG - 61,000 mi. Kathleen, Ext. 3604.

73 VW BUS - After 5:30 p.m., 363-2736.

68 VW - $650. 475-0831.

74 MAVERICK - $1,400. Lee, Ext. 7738 or 3015.

77 OLDS CUTLASS - $2,800. Victor, Ext. 2284 or 3200 after 5 p.m.

79 CHEVY MALIBU - $3,500. Miquel, Ext. 2301.

76 AMC PACER - $1,300. Chup, Ext. 4360 or 3076.

81 DATSUN 210 - Richard, Ext. 4395 or 653-4195.

BATTERY VW - New, $35. Tom, Ext. 3128.

77 MERCURY COUGAR - $2,500. Kathrin, 281-8021.

68 VW SQUAREBACK - $150/best offer. Tom, Ext. 3128.

77 CHEVY MONZA SEDAN - $2,600 neg. Joann, 281-8021.

AM-FM RADIO - Stereo, excel., $35. Ben, Ext. 7732.

68 PONTIAC GRAND PRIX - Eugene, Ext. 4690 or 265-5218.

TIRES - 2 P215/75R15, G. Belted, $10/pr. & GR78-15, S. Belted, $3.00. Whitey, Ext. 2913.

TIRES - 2 185/7014 rad., $65/pr. Greg, Ext. 4034.

71 CAMERO 307 - $1,500. Jean, Ext. 3925, 286-9126 after 4:30 p.m.

78 PLYM FURY WAGON - Walt, Ext. 5316.

79 CAMARO Z-28 - Leu, Ext. 3082.

79 HONDA CB - 750K. $2,000, Lewis, 477-2262.

74 CORVETTE - $8,800. After 3 p.m., Martine, 286-2221

SERVICE MANUAL - 78-79 Pontiac all models, $15. Pete, Ext. 4819.

81 VOLVO GL - Mint cond. Alice, 878-0717.

82 RABBIT - $5,900. Mario, eves 744-4781.

14" RIMS - Plym/Ford, slotted chrome, 2/$20. & 1 v.g. tire, F-70-14. Steven, 744-3141.

MINI BIKE - 3½ h.p.. $150. Jay 5-7 p.m. 360-0841.

82 TOYOTA TERCEL - 1,700 mi., excel. cond. $5,900. Anita, 744-1845.

Boats & Marine Supplies

24' WINNER CRUISER - Fiberglass cabin, 165 h.p., excel. cond. After 5/31 eves, John, 669-9234.

15' SAILBOAT - Handcrafted oak & mahogany, w/trailer & motor, best offer. Reply to Box 143, Pt. Jefferson, NY 11777.

82 JOHNSON - 175 h.p., o.b. cables controls, excel.: David, 669-7952.

16' COMET SAILBOAT - Renovated recently, aluminum mast. $400., Bernie, Ext. 4842 or 331-2298.

MARINE ENGINE PARTS - new, used, recond, lg. inventory. Eugene, eves. 265-5218.

69 CHRIS CRAFT - 18' speedboat, mahogany, 283CI, mint, coll. item. $4,000. Mike, eves. 289-0602.

AQUA METER SAILBOAT COMPASS - w/mounting bracket. Fully gimballed. $25., Cory, Ext. 7994 or after 6 p.m. 286-8915.

35' PEMBROKE - F/B Sedan T/Chry V-8's, fully equip., $13,500. William, GR-5-8710.

17' SAILBOAT - Fiberglass, loaded w/extras, O.B., trailer, 3 sails, sleeps 4. Everything you need to start sailing, for $3,500. Fred, Ext. 2057 or 261-5735.

PROP. 10"x11" - for older 75 h.p. & up, Johnson, $15., depth finder, R. Jefferson model 510, $35., Bob Ext. 4474.

20' OWENS - wood boat w/cabin, $250; Flying gaff, stainless steel, cost $100. asking $50. Linda, Ext. 2733 or 878-8491.

ZINCS - Shaft collars, Rudder buttons, outdrive Zincs, OMC Merc, Volvo, etc. Bill, Ext. 4664 or 298-4089.

Free

BIRD DOG - male, 10 mos, blk/wht, altered, had all shots , needs lg. yard. Ronnie, 281-1862.

GMC BABY CAR SEAT - Good cond., Victor, Ext. 2284 or 3200 after 5 p.m.

Yard Sale

JUNE 4 & 5 - toys, clothes, assort. items. 9 Abbott Ave., Mastic. 399-0676.

JUNE 4 & 5 - 10 a.m. - 3 p.m., Pepperidge La. (off No. Prospect) W. Patchogue.

YARD SALES GALORE - Shoridge Hills, off No. Country Rd, Shoreham, Sat. 6/11 - 9:30 a.m., rain date 6/12.

Miscellaneous

FREEZER - upright, frostless, 15.3 cu. ft., Sears, excel. cond., 10 yrs. old, white porceline finish. Jennifer, 475-3623.

CARPET - blue 10'x11'; Bassett square sofa table, 6' decorator wall units. Ext. 3565 or 924-8594.

ROLL-TOP DESK - solid oak, $480; GE color TV, 19", remote control, $400. 981-9584 eves.

COUCH - Simmons convertible queen size, $150; also glass & wicker cocktail tables & 1 end table, $100. Mike, Ext. 7941.

TV MAGNAVOX - color, 25", lg. maple cab., needs work. Make offer. Ron, Ext. 7696, 289-1003.

DAYTON STAINLESS STEEL PUMPS - V. 110/208/230, 1-1/2 H.P., inlet 1-1/2, outlet 1-1/4, $30; 1/2 H.P. inlet 3/4, outlet 1/2, $20. Angelo, Ext 3457.

GAF PROJECTOR - 8/super 8, $25; paper shred basket, 110V, $20; Sears multi band radio, also a.m.-f.m. elec. battery, $20. Angelo, Ext. 3457.

SOFA - Simmons, $75; color TV, $50; weight bench, $110. 744-1845.

WINDOWS - 1 Andersen 41"w.d.x37"h, 1-over 6, 33"w.d.x41"h, metal awning 46" w.d. Best offer, 475-3731 after 6 p.m. S. Saulle, 286-1082.

STORM DOOR - w/screen 31"x80", 2 pr. shutters 12"x51" and 12"x39". Best offer. 475-3731 after 6 p.m.

REFRIGERATOR - G.E., frost free, 15.7 cu. ft., gold, top freezer, used 2 yr. $250. Leonard, Ext. 4457.

STORM DOOR - 36", white aluminum. $45. Ext. 4395 or 653-4195.

COLEMAN METAL COOLER - $25; badminton racquet, $5. Wick, Ext. 4372 or 924-0582 after 6 p.m.

TICKETS - "Fiddler," benefit Christ Church, donation $12, June 11, 8 p.m. 924-4611 or 281-3367.

AMP - Spectra #225, 2-12" speakers with foot ped. control, excel cond., plus elec. guitar. $475. Den, 289-0753.

OIL PAINTINGS - covered bridge, German mountain lake, loverly restful waterscape with old stone bridge. 581-5126.

ELECTRIC GUITAR - case, amplifier, booster accessories. $160. Victor, Ext. 2284 or Ext. 3200 after 5 p.m.

PICNIC TABLE - with attached benches (pine wood). You pick up. Eastport. $25. Karen, Ext. 2950.

GUITAR - fender "Jaguar" dual pick-up with Tremolo arm, hard case incl., excel. cond. $250. Azzara, 7732.

BICYCLE SEAT - Sears, good cond., $10. Pete, Ext. 4960 after 6 p.m., 751-2830.

LARGE AIR CONDITIONERS - 2, $75 each, good running condition. Ext. 4058 or 286-0436.

D.C. POWER SUPPLY - 50V-50A, three phase input, weighs about 300 lbs. Asking $100. Ext. 4058 or 286-0436.

PIANO CONSOLE - with bench, pecan wood, excel. cond. $750. Call Martine after 3 p.m. 286-2221

DOBERMANN PUPS - AKC, red & black, good temperment, mother on premises. Ext. 4095.

POOL DECK - side mount ladder & seat at top, deck measures 3'x3' for 4' deep pool. $25. Ext. 4456 or 281-0360.

DRAPES - burnt orange, 120"wx84"l w/traverse, white shear w/orange floral pattern curtains. 120"x84", both $50. 281-0360.

CANOPY BED - white, twin size with mattress & box spring, excel. cond. Asking $150. 654-0810.

FLASHUNITS - Honeywell Strobonar with charger, Honeywell Tilt-a-Mite (bulb), Minicam Speedlight 100 with power pack. Frank, Ext. 3120.

DROP LEAF TABLE - seats 12, opens to 7'6"x3'2" plus pads & 2 chairs, mahogony. Petersen, 821-0865

MULTIVOX MX2000 SNYTHESIZER - excel. cond. $400. 363-2614 after 6 p.m.

WHIRLPOOL WASHER - super capacity, 2-speed, 4-cycle, permanent press. $125. Gary, Ext. 2350 or 567-9617.

HOTTUB - 7' dia., redwood, 3 yrs. old. Make offer. Ron, Ext 7696 or 289-1003.

FREEZER FRIGIDAIRE - upright, 18.7 cu. ft., excel. cond. $200. 363-6121.

PLANT SHELF - fits on windowsill, $3; handmade knitted red shoulder bag, inside finished, $10. 589-5126.

BICYCLES - 2/3 wheel, Remington belt exercise machine, baby stroller w/sun shield. 924-3755.

FREEZER - Hotpoint 11½ cu. ft., excel. cond. $150. Ext. 3793.

BASF BLANK CASSETTE TAPES - C-90, CrO_2. $2.75 each. Ext. 2521.

PICNIC TABLE - very sturdy, $25; small dresser, 4 drawers, ideal for children, $10. Joe, Ext. 7961, 878-2655 eves.

SOFA - pine, wing chair, ottoman, 2 pedestal tables, antique blue, (Ethan Allen). $350. Ext. 3793.

BUTCHER BLOCK ROUND KITCHEN TABLE - 42" diam. with 3 real leather swivel chairs. $200. 363-6121.

CANOPY BED - frame, white, good cond. $50. Ext. 2964.

MOVING SALE - contents of house, furniture, lamps, tables, beds, tools, garden miscl. Call 588-5949.

TALKING ENGLISH PARAKEET - with cage, $60 firm; various oil paintings, mint condition, $15-$40. Irene, 589-5126.

WADING POOL - above ground, 10' diam., 2½' depth, new cover. $15. 286-2788.

GE AIR CONDITIONER - 14,000 BTU, operates on any outlet. Ext. 3392 or 475-8330.

KEROSUN RADIANT 10 HEATER - $75; 80-200 zoom lens for OM 10, new, $70. 589-3608.

HYDROHEARTH FIREPLACE - grate supplements baseboard hot water, complete grate and some pipe fittings. $50. Victor, Ext. 2395.

4 PIECE DRUM SET - with 14" Paiste cymbal. Call Terry after 4 p.m., 325-1080.

R/C KRAFT SPORTSERIES - 4 servos, charger, 3 planes, motor, extras. $325. Ext. 7187, 981-9434.

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

WESTHAMPTON - 1 acre on Peter's Lane, Quoque. Asking $18,000. Bert or Jim, 288-9271 after 4 p.m.

BROOKHAVEN HAMLET - custom 4 bdrm., 3 bath, 2 car garage, oak floors, excellent cond., privacy on 1.25 acres, $125K. Ext. 4058 or 286-0436.

EAST MORICHES - Newport Bch. (near The Hamptons), 13 miles from Lab, 3 bdrms., 2½ baths, 2 car garage, laundry rm., playrm. with f/p, fenced backyard, 2 zone heating, ½ acre, private bch. and marina, $69,500. Ext. 2733 or 878-8491.

MIDDLE ISLAND - Artist Lake Condo, 2 bdrms., 2 baths, upstairs, all appl. (incl. washer/dryer, central a/c), balcony, $34,000. 924-4611 eves.

FARMINGVILLE - ranch, 4 bdrms., 2 bath, den, country kitchen, l/r, garage, fin. basement, low taxes, possible mother/daughter, mid-70's. 732-8241.

WADING RIVER - Colonial Cape, 4 bdrms., d/r, eik, 2 car garage, 2100 sq. ft. on 175'x600' lot. Shoreham/Wading River School District. Asking $115,000. Ext. 4313 or 929-4551.

BAYSHORE - 3 bdrm. ranch, l/r, eik, d/r, all alum. trim & schutters, new roof, fenced yard, mint cond., gas heat, assume 7% mortg., $320 pays all or refinance, must see to appreciate, $41,500. George, Ext. 3397 or 666-4133.

MASTIC AREA - house, 6 bdrms., 2 baths, 8 yrs. old, fence all around. $41,500. Eddie, Ext. 2951 or 399-1821.

ONE ACRE BLDG. PLOT - 100x400, fully wooded, quiet residential neighborhood, asking $13,900, price & terms negotiable. 924-3236.

For Rent

MT. SINAI - off Canal Rd., 3 bdrm. ranch, 2 baths, full finished basement, fully furnished, July 1-Aug. 31, $700/mo., util. no incl. Ext. 4260 or 928-5737.

APT. - 2 rm. apt. for rent, private, furnished. Working person. Quiet place. 281-6099 after 3 p.m.

EAST PATCHOGUE - 2 bdrms., l/r, eik, avail. Aug. 1. $260/mo plus util. Walt, 698-0576.

SHOREHAM - 4 bdrm. Cape, 2 full baths, fin. bsmt., covered patio, furn., a/c, TV, bar, available July & Aug., nice neighborhood. Asking $625/mo. Ext. 3060 or 744-4081 after 6 p.m.

VERMONT HOUSE - Reasonable vacation, family oriented, 3 bdrms., 2 baths, fireplace, fully equipped, beautiful view, woodland trails, alpine slide, golf, tennis, summer theater, obating, fishing, etc., avail. weekly or weekends. 732-6499 after 6 p.m.

NORTH PATCHOGUE - kit, l/r, bath, w/w carpet, cable hook-up and private entrance. Singles only, no pets, only $325. Carol 289-3917.

Carpools

RONKONKOMA - driver to join 3 person pool near LIE Exit 60. Victor, Ext. 2395.

PATCHOGUE - on time pool, opening for paying rider. Alyce, Ext. 2902.

COMMACK - looking to join carpool, 8:00-4:30. Don, Ext. 2043.

STONY BROOK - Strathmore vicinity, Ext. 4192.

COMMACK AREA - door to door, 8:30 to 5 p.m., on time. Jim, Ext. 4452 or 543-0079.

Wanted

HOUSEMATE - share large 4 bdrm., 3 bathrm, house, 20 min. to Lab, sundeck, washer/dryer, $164 + 1/3 util. Ext. 2521 or 928-8379 eves.

FILE CABINET - 2, 3, or 4 drawers 18" wide (legal size), good cond., Ext. 3589.

BROOKHAVEN BUSINESS & PROFESSIONAL WOMEN'S CLUB - expanding, new members welcome, for info call Alyce, Ext. 5203.

FLUTE - for beginning student, reasonable, 286-8249 after 5 p.m.

TROMBONE - reasonable for 11 yr. old. 289-0494 after 5:30 p.m.

TO RENT - house or apt. for couple during July. Ext. 4192.

BABYSITTER - for one yr. old girl, substitute teacher's hrs., your house or mine, Shoreham. Ext. 4421 or 744-0722.

HUTCH - china closet, wooden secretary, wooden kitchen chairs. Ext. 3565 or 878-2233.

ROOMMATE - large house, 5 min. from BNL, avail. immed. Jack, 924-3669.

OUTBOARD MOTOR - dead or alive, cash paid for your Johnson or Evinrude. 265-5218 eves.

ENCLOPEDIA - Brittanica, Metronome. Ralph, Ext. 4171.

PEOPLE - interested to meet & discuss life threatening problem of nuclear arms race. Vasilis or Christine, 543-0487 eves.

OFF ROAD TRIKE - will consider bent and/or broken 110cc or 185cc, 4 cycle. Bob, Ext. 5286 or 298-9594.

FENDER - '76 Monte Carlo, right side, must be clean. 585-3417, eves.

BABYSITTER - for two and five yr. olds, Mon.-Wed., for summer and school holidays. Maria, 924-3756.

LADDER - aluminum extension, 28'-34', reasonably priced. 473-4542, after 6:00/wkends.

Services

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

TRUCK - and worker for hire, waste removal, items picked up and delivered. Greg, 399-4213.

HOUSE SITTING - free, reliable, experienced, caring, any duration, June-Aug. J. Allentuck, Ext. 2412.

ALARMS - fire and burglar, free survey. Richie, 666-3334.

MOTHER'S HELPER - experienced teen seeking full time summer employment, Bellport, E. Patchogue area. Angela, 289-5251.

DJ - available, all occasions, 50's, 60's, 70's & 80's music, reel to reel encoded/decoded to master tapes. Al, Ext. 3992 or 331-1003.

WELDING - portable gas or arc welding. 929-3209 after 6:00/wkends.

YARD CLEANING - lawn mowed, tree removeable or any landscaping. Greg, 399-4213.

WATERPROOFING - and exterminating, licensed men, all work guaranteed in writing, over 15 yrs. experience, free estimates, Lab discount. 281-5445.

ROTOTILLING - new or established lawns or gardens. 929-3209 after 6:00/wkends.

WORD PROCESSING INSTRUCTION - hands on practice, just 10 easy lessons, free introductory lesson. Janie, 698-2710.

TRUCK FOR HIRE - no job too small, Lab discount. 281-5445.

BUG TROUBLE? - exterminating service, free estimate, 399-2424.

LIMO SERVICE - luxury chauffered limo, proms, weddings, airport, any occasion. Roy, Ext. 4664 or 744-8779.

ELECTRICIAN - licensed, free estimates, reasonable rates, security lighting, pools, service changes, no job too small. 744-0722.

WATCH REPAIR - George Hrabak, Ext. 3536.

ELECTROLYSIS - permanent removal of unwanted hair. Physician trained, Board certified, latest method, free consultation. 331-4768.

BABYSITTER - exp., in my home, dependable, refs. Lucy, 698-0576.

PAINTING - interior, exterior, panelling, carpentry, free estimates, BNL references. John, 924-5012 eves.

RACKET RESTRINGING - blue star, $13; gut, $20; regrip, $4. Ext. 4098 or 736-4886 eves.

SHARPENING - hand and circular saws, mower and planer blades, scissors. Joe, 732-3286 or Marie, Ext. 4231.

LAND CLEARING - using excellent rake on JD450 track loader. $45/hr. w/operator. Tom, Ext. 4084 or 878-1060.

Ads left out of this issue due to lack of space need not be re-submitted to appear in next week's issue. Please note that ads may not be more than 15 words long and must be received in the Bulletin office by 4:30 p.m. Friday, for inclusion in the following week's Bulletin.

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