BROOKHAVEN BULLETIN
Volume 34 - Number 9 / February 29, 1980
BROOKHAVEN NATIONAL LABORATORY

Superconducting Magnet Workshop

The Department of Energy is sponsoring a workshop on superconducting magnet technology to be held at Brookhaven, March 5 and 6. The workshop is to be chaired by John Blewett of BNL, assisted by an organizing committee consisting of W. Sampson, BNL; A. Tollestrup, Fermilab; W. Gilbert, LBL; and D. Sutter, M. Month and B. Kropschot of the Department of Energy.

The purpose of the workshop is to review current and planned R&D on the development of superconducting magnet technology for application in high energy physics. The participants will also review current problems and explore R&D topics needing further work toward design and construction of the next generation of accelerators and storage rings. It is hoped that the workshop will provide an important and timely opportunity to share information on the progress of superconducting magnet technology.

Most concerned with applications of superconducting magnets in high energy physics in the United States have been the groups at Berkeley, Fermilab and Brookhaven; from these groups will come the major contributors to the workshop. Several related groups, however, will be represented including Rutherford Laboratory, the Orsay group, National Bureau of Standards in Colorado, National Magnet Laboratory, Oak Ridge National Laboratory, Los Alamos Scientific Laboratory, Argonne National Laboratory, Lawrence Livermore Laboratory and the University of Wisconsin.

Tune In!

Regarding the great oil shortage, why are we not utilizing the vast amounts of oil shale in this country? It has been said by noted geologists and scientists that there are trillions of barrels of unprocessed oil shale in this country.

Israel is working on a process of using lasers to extract oil from shale. Why not the United States? If Israel can afford the method surely we can.

Answer:

Oil shale is an important domestic resource; the richest shale deposits, in the Green River Formation (which covers 16,000 square miles of Colorado, Wyoming, and Utah) are estimated to contain 1.8 trillion barrels of oil.

Shale oil production has thus far been constrained primarily by economics; it is estimated that shale oil from a large scale facility would cost $25-30 barrel, and that a 50,000 barrel per day plant would require an investment of over a billion dollars. As demonstrated by other pioneer projects in the energy field (e.g., Syncrude, in Canada) there is substantial risk that these estimates are low. However, several companies – Occidental Petroleum, Union Oil, Colony Development, Rio Blanco Oil Shale Co. – have plans for plants, and research into the viability of various extraction techniques is under way. Unanswered questions remain about other vital factors as well – environmental concerns (air and ground water pollution, revegetation of waste shale), water availability, and the social and economic consequences of rapid growth in the resource area – which probably will not be resolved until the start of limited production.

Extraction of useful liquids from oil shale requires, in principle, little more than heating the rock. The easiest and most economical ways to do this involve

(Continued on page 2)

Last Of The Bubbles

The 7-foot bubble chamber ended its last run early this year on January 18. The chamber was shut down permanently because the people who run it are needed by ISABELLE. With its closing, the bubble chamber era at Brookhaven has come to an end.

The 7-foot was the last in a line of chambers that started with the 6-inch in 1957 and increased in size through the 20, 30, 31 and 80-inch chambers. All were built in Ralph Shutt's Bubble Chamber Group, which had grown to about 250 members in 1970. He and many others who worked on bubble chambers though the years have already become involved with ISABELLE, where a good deal of what was learned in bubble chambers is immediately applicable, primarily in design and construction of large cryogenic systems.

The 7-foot chamber actually began as a test facility, which from 1968 through 1970 was used to perfect a large number of new ideas developed at the Lab. From January 1971, the chamber was modified to make it a flexible, smooth-functioning experimental user facility.

It was located at the end of the neutrino beam in the North Experimental area of the AGS and was used only for neutrino studies. The first tracks were seen in May 1973, and the first physics pictures were taken in November of that year. Those earliest pictures, taken more in the spirit of chamber testing than physics production, contained the first example of revealed charm. In typical bubble chamber fashion, a rare event was seen early in the life of the chamber. It was not until half a million pictures later that the second clear example appeared.

Charm is one of the characteristics that can be found in some elementary particles. It was predicted by a theory called quantum chromodynamics. For the development of this theory, the 1979 Nobel prize in physics went jointly to Sheldon Glashow, Steven Weinberg and Abdus Salam.

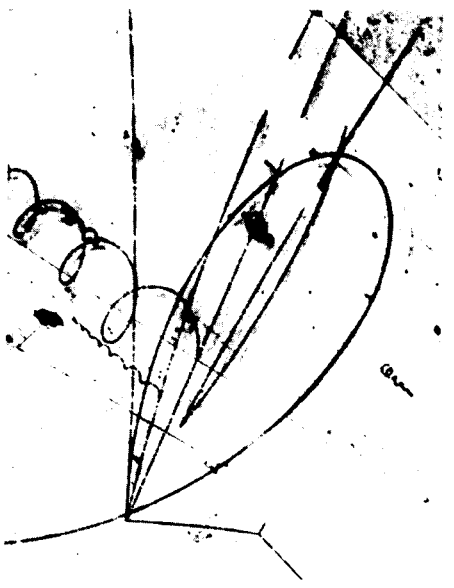
During the seven-year lifetime of the chamber, a total of 3.9 million pictures were taken, second only to Argonne's 12-foot chamber. A little over half the pictures were in deuterium, a third in neon-hydrogen mixtures, and about a tenth in hydrogen.

The chamber was encircled by one of the world's largest and most powerful air-core superconducting magnets. The magnet was totally immersed in liquid helium at 4° Kelvin (−450° F), a temperature at which its conductor loses its resistance to current flow and becomes superconducting. It achieved an operating field of 28.2 kilogauss, which is about 50,000 times stronger than the earth's magnetic field.

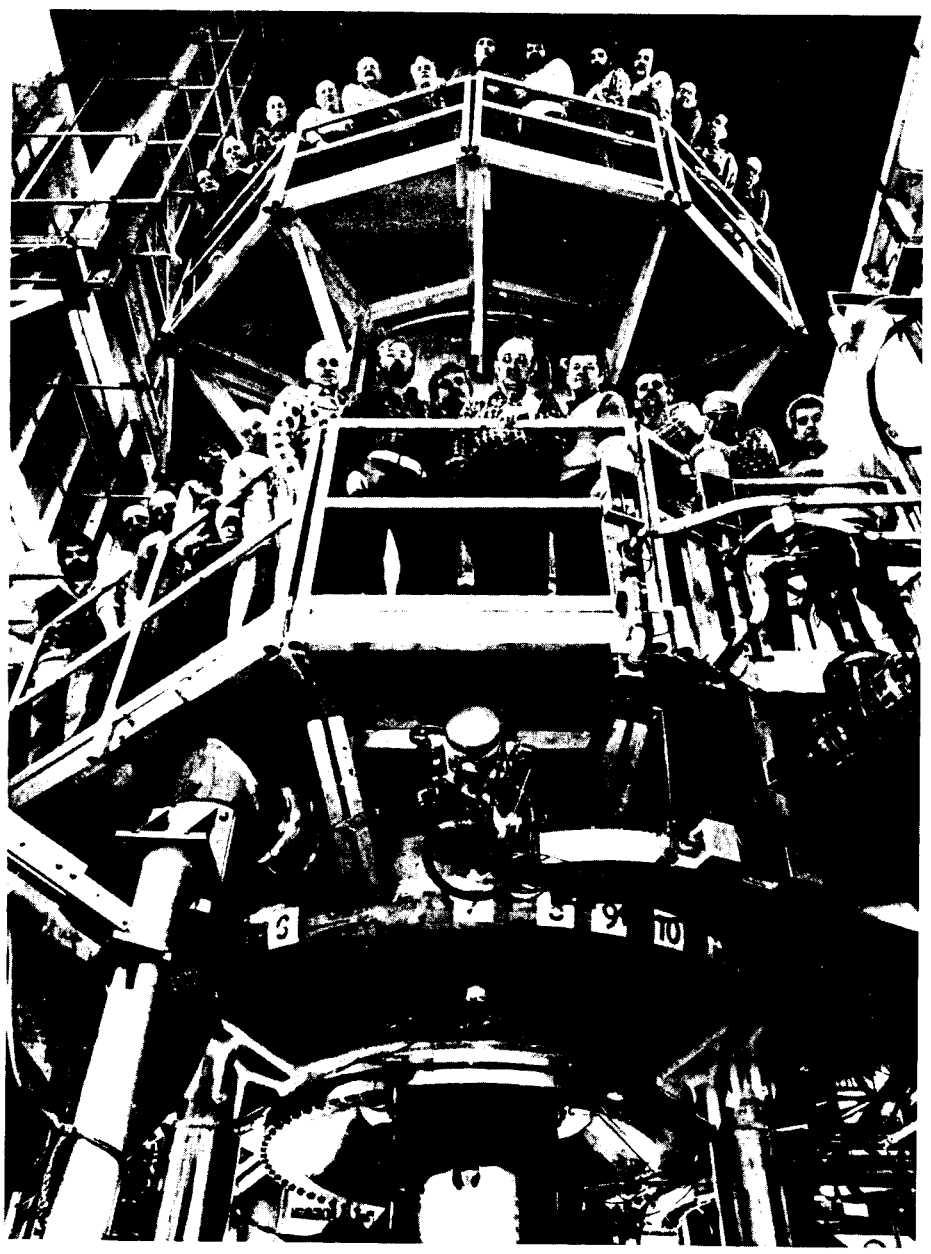
The usefulness of a bubble chamber for high energy physics depends significantly on the intensity of the magnetic field surrounding the chamber. When the chamber is large, as is the 7-foot, high magnetic fields are much more economical with superconductors than with ordinary conductors. During the chamber's last year of operation, cost of power for the superconducting system was $25,000. If it had used a normal conductor, the power cost would have been $1.6 million a year.

Various types of detectors have been devised to study the atom and subatomic particles. Bubble chambers are particularly useful for exploratory experiments because of their very high spatial resolution. But electronic wire chamber arrays have now achieved spatial resolutions nearly as good as bubble chambers, and their time resolution has always been greatly superior to bubble chambers. Also, the cost of building and operating such electronic systems is far less than the cost of bubble chambers.

Thus, bubble chamber technique is now becoming obsolescent. But for years, the 7-foot bubble chamber and its predecessors gave scientists insight into the nature of matter.



The first picture of a subatomic "charmed particle" was taken in the 7-foot bubble chamber in 1974. It remains probably the best single example of charm yet observed. This is a photograph of the original film of the event.



At the 7-foot bubble chamber, most of the staff gathers for a final picture. On the lower tier, left to right, are: Mike Iarocci, Bob Barberich, Jim Mottl, Bob Kiss, Carl Goodzeit, Bill Stars, Tom Kromer, Jack Sondericker, Bob Dagradi, Bill Casswell, Dale Norden, Howard Olson and Joe Ferrante. On the upper tier are: Dean Campbell, Chris Harbach, Bill DeVito, Roger Kiely, Jim Davis, Bob Aichroth, Ron Picinich, Richie Ferdinand, Randy Abramowitz, Mark Sardzinski, Warren Hirzel, Austin Gwilt and Don Brown. Missing from the picture are: Jim Sauls, Bill Venegas, Stan Staron and John Frasher. —photo by Rosen

Speakers Bureau February

Ralph Jones (DEE); **Richard Krajewski** (DEE), Long Island Energy Expo at Colonie Hill, Brookhaven's Solar Thermal House; Brookhaven's Burner-Boiler/Furnace Efficiency Test Project, February 1.

Andrew Hull (S&EP), Half Hollow Hills High School Energy Forum, Radiation Risks (and other risks of energy production and use), February 1.

William Graves (DEE), Brookhaven Town Planning Board, Solar Energy and Energy Conservation in Buildings, February 4.

Anthony Hendricks (DEE), Northport Public Library, Passive Solar Homes and Residential Energy Conservation, February 4.

Martin Plotkin (Accel), Sayville High School Career Day, Careers in Science and Engineering, February 6.

R.C. Anderson (DO), Jericho Gardens Civic Association, Energy Conervation and Energy Options, February 11.

Edward MacDougall (DNE), Town of Islip Flower and Garden Show, Solar Greenhouses, February 16.

Shale Oil (Cont'd)

burning some of the shale oil, either in the ground itself or in a plant on the surface after mining the shale. More exotic methods of heating the rock, such as microwaves or lasers, require use of a high-grade and expensive energy form, i.e., electricity. The economic and technical feasibility of such methods is currently being investigated in the U.S. and abroad, and may ultimately prove useful; in fact, lasers are now used for extracting and analyzing samples, and have been proposed for forming tunnels in the shale to assist in situ recovery. For the near term, however, the most practical commercial extraction methods involve mining and surface retorting or in situ combustion of the shale, and these processes are being developed in the several projects now under way or being planned in the U.S.

—Jerome Lamontagne
National Center for Analysis of Energy Systems

French Club

The next meeting of *Le Cercle Français de BNL* will take place at 8 p. m. on Wednesday, March 12, in Room C of Berkner Hall. The evening will feature a "do-it-yourself" travelogue, during which a number of slides will be projected. These will show well-known buildings, monuments, and landscapes of France, often photographed from an unusual angle, or from some unique point of view. The object of the game is to identify as many of the scenes as possible, and the winner will receive a famous French export as a prize. Incidentally, the most spectacular identification so far was made by one of our former members, who instantly recognized the Café de la Paix in Paris from the shape of the chairs (she says).

Even if you don't feel competitive, this evening will provide an opportunity to expand your travel horizons, and to view some excellent color photographs. If you have slides (2x2) that you think could be used, contact Jim Ho at 345-4157. Refreshments will be served after the meeting. Non-members of the French Group will be asked for a donation of $1.

Do Not Cover

Experiments by the United States Department of Agriculture have shown that certain kinds of flower seeds germinate better when exposed to light. This means that they should not be covered with soil, whether started indoors under lights or sprouted in a garden row.

A good procedure for planting these seeds is to make shallow furrows by pressing the edge of a thin board into moist soil or planting mixture. Sow the seeds thinly down the furrow. Don't cover with soil. Water with a very fine spray, being careful not to wash away the seeds or bury them under soil.

Seeds requiring light include:

Ageratum	Helichrysum (strawflower)
Begonia	Impatiens
Browallia	Matricaria or Feverfew
Calceolaria	Nicotiana or Flowering Tobacco
Coleus	Petunia
Cineraria	Primula malacoides
Exacum	Salvia (red only, not blue)
Gloxinia	Snapdragon

Stony Brook Events

Children's Theater: "Little Mary Sunshine." March 1, 7, 8 at 8 p.m.; March 2, 9 at 2 p.m.; Stony Brook Union Auditorium. Tickets: $2.50, group rates available. Information: 751-7243, 585-1868.

Concert: Chamber Singers, Marguerite Brooks conducting. March 2, 3 p.m., Recital Hall, Fine Arts Center. Donation $1.

Recital: Chamber Music. March 3, 8 p.m., Recital Hall. Fine Arts Center. Information: 246-5672.

Recital: Pianist Gayle Martin. March 9, 5 p.m., Sunwood Estate, Mt. Grey Rd., Old Field. Part of the Sunwood Sundays at Five series. $6.

Toxicology Workshop At BNL

Michael Bender, Medical, answers questions about the Medical Research Center's Tissue Culture Facility, during this week's Workshop on Genetic and Cytogenetic Toxicology. Over 30 persons, primarily from industry and government agencies, are attending the five-day instructional program, which will end today. Participants are professionals involved in the safety evaluation of new drugs and chemicals, such as food additives, industrial chemicals, pesticides, cosmetics, and pharmaceuticals. In addition to visits to several BNL facilities, the program included intensive lectures by Laboratory staff and guest faculty, dealing with the principal methods currently employed in genetic toxicology testing. The workshop was sponsored by AUI and the Environmental Mutagen Society.

—photo by Humphrey

Women In Science

Vincent R. O'Leary, Associate Director, will speak about BNL policy on day-care centers, credit unions and transportation, at the next Women in Science Association meeting on Wednesday, March 5, at noon in Room B, Berkner Hall. All are invited to attend. Please bring your own lunch.

Selected Reading

Am. Sci. 68 (1), January-February 1980
Is human memory obsolete? W.K. Estes. 62-9

Nature 283 (5747), February 7, 1980
Research centres, libraries, journals flourish in new China. T.B. Tang, 516-17

Science 207 (4432), February 15, 1980
Wind power excites utility interest. R.J. Smith 739-42

Perception Of Risk

How risky is fire fighting? What about swimming, mowing lawns or mountain climbing?

Psychologists at Decision Research in Oregon did a study on how four different groups of people rate different activities and technologies according to the risk of dying from each. Three of the groups were: 30 college students, 40 members of the League of Women Voters (LOWV), and 25 business and professional members of the "Active Club."

The fourth group was made up of 15 persons selected nationwide for their professional involvement in risk assessment. The experts included a geographer, an environmental policy analyst, an economist, a lawyer, a biologist, a biochemist, and a government regulator of hazardous materials.

Results of their study are listed in this chart, reprinted from *Environment*, April 1979. Rank 1 represents the most risky activity or technology. It is interesting to note the differences of risk perception among the four groups. For example, college students rank swimming as the least risky activity, while experts rank it 10 in a list of 30.

Ordering Of Perceived Risk For 30 Activities And Technologies*

	Group 1 LOWV	Group 2 College Students	Group 3 Active Club Members	Group 4 Experts
Nuclear power	1	1	8	20
Motor vehicles	2	5	3	1
Handguns	3	2	1	4
Smoking	4	3	4	2
Motorcycles	5	6	2	6
Alcoholic beverages	6	7	5	3
General (private) aviation	7	15	11	12
Police work	8	8	7	17
Pesticides	9	4	15	8
Surgery	10	11	9	5
Fire fighting	11	10	6	18
Large construction	12	14	13	13
Hunting	13	18	10	23
Spray cans	14	13	23	26
Mountain climbing	15	22	12	29
Bicycles	16	24	14	15
Commercial aviation	17	16	18	16
Electric power	18	19	19	9
Swimming	19	30	17	10
Contraceptives	20	9	22	11
Skiing	21	25	16	30
X-rays	22	17	24	7
High school and college football	23	26	21	27
Railroads	24	23	20	19
Food preservatives	25	12	28	14
Food coloring	26	20	30	21
Power mowers	27	28	25	28
Prescription antibiotics	28	21	26	24
Home appliances	29	27	27	22
Vaccinations	30	29	29	25

*The ordering is based on the geometric mean risk ratings within each group. Rank 1 represents the most risky activity or technology.

Exchange Program

Two BNL employees and their families have been hosting Scandinavian exchange students this school year. They are participating in a program sponsored by the American Scandinavian Student Exchange, which places with host families qualified high school students from Denmark, Finland, Norway and Sweden.

Anita Grimelid, a Norwegian, is spending her year with Ken Riker, Accelerator, and his family in Mastic Beach. Riker's wife is from Norway, and they plan to visit the country soon, so it has been a good opportunity to share information. Riker says that Anita has become thoroughly involved with life on Long Island, and it is a pleasure having her.

Äsa Olofson of Sweden is being hosted by Don Stonebridge, Reactor Division, and his family in Bellport. Stonebridge says that Äsa has become part of their family. He also comments that the student program is a good way to meet new people and exchange ideas.

The Student Exchange is now seeking host families for the next school year. Students are from 16 to 18 years of age, are proficient in English, and will attend the local high school of the host family. They will arrive in late August and will have complete medical insurance and sufficient pocket money for sight-seeing and other activities. Also through this program. American high school students have the opportunity to spend a year with a Scandinavian family.

If you would enjoy being a host family, or if you simply want more information to think it over, contact Penny Tarplin, Eastern USA Coordinator, at (516) 666-8404, or Miriam McKendrick, Area Representative, at (516) 363-6547.

Retiring Today

Mort Rosen

Charles L. Gerle, Plumber A, and a Group Leader in Plant Engineering will retire today after 33 years at the Lab. Although he will keep his home in Mastic as a base, he now plans to travel extensively around the country.

Arrivals & Departures

Arrivals

Carl J. Czajkowski.....Nuclear Energy
Raymond P. Hoey.....Plant Engineering
Stephen J. Murtagh.....Physics
Colleen L. Niederstein.....Contr. & Proc.
Richard M. Quick.....Accelerator
Edward R. Scarano.....Ph. & Gr. Arts
Michael D. Zentner.....Nuclear Energy

Departures

Michael A. Angelone.....Plant Engrg.
Elwood J. Barnes.....Staff Services
Steven Guterman.....Energy & Env.
June Hinton.....Tech. Info.

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Runner's Day

The BNL roadrunners will host their third annual Runner's Day on Friday evening, March 7 at 7 p.m. This year's program will be held at the BERA Recreation Center and will feature films, a speaker and informal group discussions on many aspects of running. The guest speaker will be Dr. Lion Caldwell of Patchogue, who holds the third fastest U.S. time for 100 miles (13 hours, 33 minutes, 45 seconds). Dr. Caldwell recently captured first place in the Houston 100 km and locally won the Bay Community Gobble Gallop.

The featured film will be "Moments of the Runner," a popular Runner's World movie reviewing the roots of long distance running and surveying some of America's most popular distance events. As an added attraction, informal group discussions are planned and will address such topics as women's running and long distance training.

A fun-run will precede the events and start from the gym at 5:30 p.m. The run will cover varying distances on quiet moon-lit Lab roads. All events are free and all BERA members, employees, friends and families are cordially invited. Come on out and get inspired for some spring-time running.

In racing news, the Roadrunners Relay Team captured 1st place honors in the Sunken Meadow Winter 6x2 mile relay sponsored by Northport Running Club. In doing so the club captured the first leg of the Northport Cup. The cup will remain at BNL for a year when another challenge race will be held.

Bicycling '80

The Paumonok Bicycle Clubs joint annual calendar meeting was held January 28. This loose association of bicycle clubs includes most of the L.I. clubs, the AYH and the NY Cycle Club. Each club agreed to sponsor at least one joint ride. Some highlights of the forthcoming season are listed below:

March 30	April Fool's Rally	AYH
April 13	Riverhead Ride	LIBC
April 27	Wildwood Park	BNL
May 4	5-Boro Tour	AYH
May 16-18	Tour of Eastern Suffolk	Paumonok
May 24-27	League of American Wheelman Convention, Rhode Island	
June 22	Yaphank-Hamptons	Sperry
July 3-6	GEAR (in the Finger Lakes region this year)	
Sept. 21	Hi-Point 100	Paumonok

The 5-Boro tour is expected to attract 10,000 riders and will start at the Battery again this year. It's about 35 miles and fairly flat except for the Verrazano Bridge. Details of the rides will be announced later.

Peanuts Gang On Stage

Charlie Brown, Snoopy and the rest of the gang will be at Berkner Hall with their song and dance in the Theater Group's latest production of "You're A Good Man, Charlie Brown." On stage from left to right are Bob Kinsey (Charlie Brown), Joe Boniface (Schroeder), Sandy Lane (Patty), Gus Basile (Linus), and Ruth Basile (little red-headed girl). Show times are March 8, 14 and 15 at 8 p.m., with a matinee performance scheduled for March 8 at 2 p.m. For further information or ticket reservations, call Liz Russell, Ext. 3940. Tickets are $3 for adults, $2 for senior citizens and students under 18, and $1 for children under 12.

Hospitality News

A morning coffee will be held Monday, March 3, from 9:30 to 11:30 a.m. in the Brookhaven Center.

All wives of Laboratory employees are welcome. Please come and bring the children. Babysitting will be provided free of charge. It is suggested that you bring along a toy or two for your child to play with.

Cafeteria
Week Ending March 7, 1980

Monday, March 3		
Corn chowder	(cup)	.45
	(bowl)	.55
Beef chop suey on rice		1.40
Scrambled eggs, sausage & fries		1.30
Hot Deli – Roasted turkey breast	(on bread)	1.40
	(on roll)	1.50
Tuesday, March 4		
Beef noodle soup	(cup)	.35
	(bowl)	.45
Grilled ham steak w/raisin sauce & 1 veg.		1.40
Chicken croquettes w/noodles & cream sauce		1.35
Hot Deli – Roast sirloin of beef	(on bread)	1.45
	(on roll)	1.55
Wednesday, March 5		
Cream of potato soup	(cup)	.45
	(bowl)	.55
Chicken cacciatore w/noodles		1.40
Broiled fillet w/french fries		1.35
Hot Deli – Veal pattie & peppers hero		1.35
Thursday, March 6		
Chicken noodle soup	(cup)	.35
	(bowl)	.45
Cheese ravioli w/1 veg.		1.30
Sauerbraten & potato pancake		1.45
Hot Deli – Smoked baked ham	(on bread)	1.35
	(on roll)	1.45
Friday, March 7		
Fish chowder	(cup)	.45
	(bowl)	.55
Spaghetti w/clam sauce & garlic bread		1.35
Breaded pork chops w/applesauce & 1 veg.		1.50
Hot Deli – Grilled Reuben		1.45

Dance!

Over 400 tickets have been sold for tonight's Leap Year Dance, to be held in the Berkner Hall Cafeteria, 8:30 p.m. to 1:00 a.m. For those who decide at the last minute that they cannot afford to miss a dance, show and snacks, all for $3, tickets will be sold at the door.

Bowling

Green League

The Old Timers II lost 11 to the 76'ers but remain in first. The Blue Jays took 8 from the Freon Loaders. N. Parinello had a 205. The Pinball Wizards took 8 from the Sandbaggers while the Sparks lost 11 to the Old Timers. The Trouble Shooters, Phoubars, and Light Source each took 3. R. Wiseman had a 212 and A. Almasy 234.

Blue & Gold League

The Aquanauts lost 7 to the Athol Regulars putting the Oh No's in first place. Walt Milian had a 201, Ralph Taylor 552 scratch and Larry Musso 524 scratch. Peg Taylor bowled a 166/164 and Mary Scheidet 162. Barbara Murgatroyd missed a triple patch by 2 pins.

Purple & White League

The Flounders took 7 from the Pen Macs to move into first place by 1 point. Ken Riker rolled a 209/169/213-591 series. Other good games were bowled by Ken Asselta 200/199, Jim Petro 202, Dave Penoyar 213, Nancy Erickson 177, Gail Schuman 175.

Red League

The Old Timers (3006 wood) shut out the Sparks 11-0. W. Reams had a 202/207-649 gross, R. Adams 214/623 gross and J. Fontana 618 gross. The 76'ers won 11-0 over the Old Timers II. J. Petro grossed 653, R. Larsen 211/626 gross. M. McKenna 604 gross. This Isa Team won 8-3 over the Trouble Shooters. W. Kollmer had a 226/605 gross, E. Sperry IV 201/605 gross and J. Sauls 623. The Designers won 8-3 over the Light Source. J. Ferrero had a 619 gross, D. Hayslip 614. The Freon Loaders took 3 from the Blue Jays. F. Hohmann had a 614 gross, T. Rudolf 611. The Strangers won 8-3 over the Phoubars and the Sandbaggers took 3 in a match with the Pinball Wizards.

Pink League

High game for the night was Pat Jencius with a 189. Other good games were bowled by Marie Grahn 178/160, Mary-Grace Meier 173, Ginny Walker 171, Helen Keeley 167, Millie Connelly 166/163, Anna Parrinello 166, Renie Rosati 164, Renee Flack 162, April Donegain 157 and Joyce Nicholsen 156.

Table Tennis

The Brookhaven Table Tennis Club hosted a friendly match with the East End Table Tennis Club from Southampton on January 29. Seven players from each club were divided into two groups. A total of 15 singles matches and 6 doubles matches were played. After a 2½ hour contest, BNL players proved to be more effective by winning 16 of the 21 matches played.

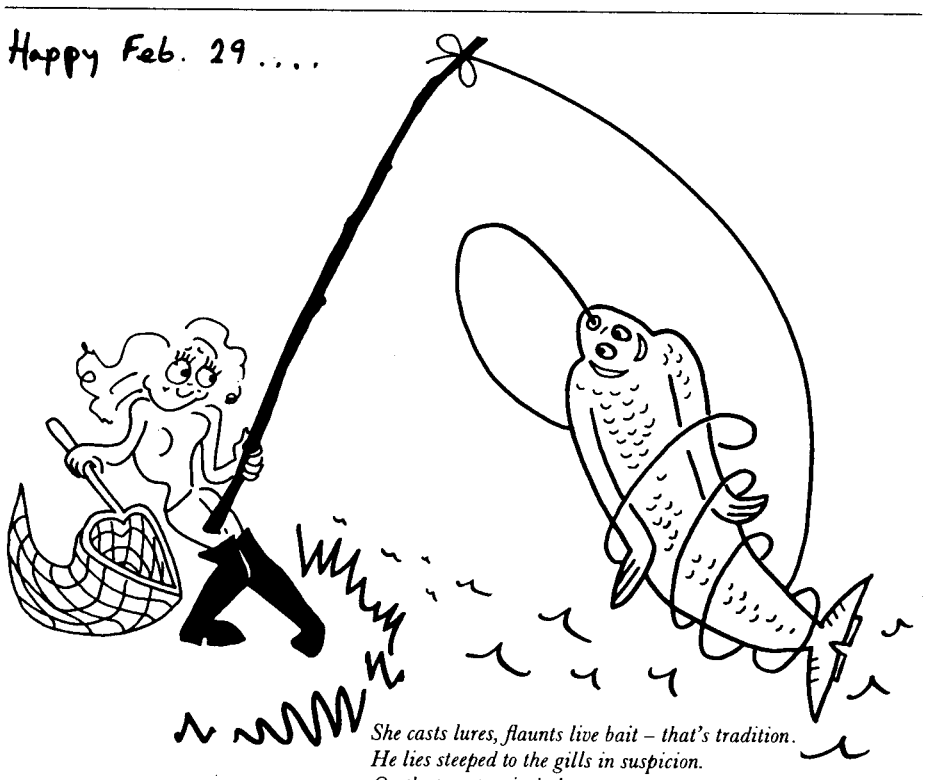
The BTTC has completed the handicap tournament. A total of 20 players participated. Preliminary matches were held to determine the rating and amount of handicap of each player. Two groups were then formed and round robin matches played. The results are as follows:

Group A	Group B
1. S. Cheng	1. K. Rohatgi
2. C. Zein	2. D. Hall
3. D. Cox	3. M. Stelts
4. S. Heller	4. P. Blacher
5. J. Dalal	5. S. Michaile
6. J. Hansen	6. T. Clifford
7. K. Li	7. D. Thomas
8. S. Hwang	8. A. Sanberg
9. B. Lee	9. T. Rimler
10. J. Wilson	10. H. Pfister

Future tournaments and clinics are being planned.

Scotch Doubles

The Scotch Doubles Bowling Tournament will be held Sunday, March 2, at 2 p.m. at the Brunswick Country Lanes in Coram. Entry forms are still available at the BERA Sales & Services Office in the Cafeteria. For additional information contact Betty Jellett, Ext. 3639 or Rich Larsen, Ext. 3464.



She casts lures, flaunts live bait – that's tradition.
He lies steeped to the gills in suspicion.
On the twenty-ninth date
Blind he leaps, looks too late –
Full-scale wedding's his fate; she *quits fishin'.*
—Liz Seubert

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.

The determination of the best-qualified candidate for available positions will be based upon education, experience and other job-related criteria. Such factors will be evaluated and measured against the demonstrable requirements of the available vacancy, as well as the Laboratory's Affirmative Action objectives.

The Laboratory is committed to a policy of Equal Opportunity in its selection and placement of personnel. Its objective is equality of opportunity in employment, training, and promotion without regard to race, color, religion, national origin, sex, age or handicap.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific 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, as indicated below. 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.

LABORATORY RECRUITMENT: Opportunity for present Laboratory employees.

1275. OFFICE SERVICES ASSISTANT - Requires an AAS degree or equivalent experience and an aptitude for working with numbers. Some experience in bookkeeping/accounting and data entry desirable. Work involves typing, posting, filing and providing general assistance to the ISABELLE Accounting Office. ISABELLE/Accelerator Department.

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

1276. MANUFACTURING ENGINEER - BS degree or equivalent in mechanical or industrial engineering with a working knowledge of machine shop practices, welding techniques and vacuum technology to direct the activities of a production facility. ISABELLE/Accelerator Department.

1277. DEVLOPMENT ENGINEER - BSME or equivalent with a background in general machine design and high precision manufacturing processes. Knowledge of vacuum technology and computer programming desirable. ISABELLE/Accelerator Department.

1278. FACILITIES ENGINEER - Requires a BS in mechanical engineering or its equivalent in education and experience. Must have substantial experience in the design of HVAC and plumbing systems and their ancillary equipment. Will be responsible for field investigations, drafting, and equipment selection. Knowledge of construction specification writing and estimating is desirable. Plant Engineering Division.

1279. MEDICAL ASSOCIATE - Requires BS or equivalent in Biology. Previous work experience in cytogenetics research is highly desirable. Will work on NIH sponsored research which investigates the toxicity of environmental pollutants. Medical Department.

1280. SR. TECHNICIAN - AAS degree or equivalent in electronic technology to work as operator in AGS Main Control Room. Requires expertise in systems trouble-shooting, computer operation and controls. Knowledge of high power rf systems and high current power supplies desirable. ROTATING SHIFT WORK. Accelerator Department.

1281. SECRETARIAL - (Temporary - 7 mos). Requires excellent secretarial and communication skills including technical typing. Knowledge of shorthand is desirable. Will function as group secretary; duties will include typing technical manuscripts and processing travel vouchers, correspondence, and requisitions. Physics Department.

Autos & Auto Supplies

TIRES - (5) Bridgestone steel belted radials, 155SR13, $110; AM radio, $10; AM/FM radio, $15. 744-5652.

76 BUICK CENTURY - 4 dr sedan, ps/pb, AM/FM, excel cond, orig owner. $1900. Mike, Ext. 4428.

72 INTER TRAV - 4 w/d, a/c, ps/pb, a/t, AM/FM, excel cond. 473-9180.

69 BUICK ELECTRA - a/c, ps/pb, 4 dr, excel mech & body cond, orig owner. $750. 665-3446.

75 COUGAR - ps/pb, p/w, AM/FM-8 trk, very good cond. $2000. Ext. 4726, 744-5056.

74 FIAT 128 - excel running cond. $1800. 878-4716.

78 YAMAHA YZ-250E - mint cond, hardly used. $875. 928-7769 after 6.

76 HONDA CVCC - good mpg, good cond. $2000. Ext. 7672.

76 OLDS OMEGA - very clean, a/t, ps/pb, AM, new tires. Asking $2250. Ed, Ext. 7943.

77 PINTO WGN - 19 mpg local, 26 hwy, good cond, radials, a/c, a/t, p/s, AM radio, roof rack. 363-6845.

72 PONTIAC GRAND PRIX - 32,000 mi (orig), 1 owner, mint cond. $2995. Carol, Ext. 2895.

77 CHEVY PICKUP - Silverado ¾ 4x4 camper sp, a/t, all pwr, cruise, tilt wheel, dual exhaust, 10" 16x5 all terrain, set of 12-16-5 tires, 22,000 mi, many extras, excel cond. 878-0516.

74 AUDI FOX - a/t, AM/FM stereo, new eng, excel cond. $1900, negotiable. 862-9178.

67 CHRY NEWPORT - good cond. Asking $600. 345-7101, 345-3031.

MAG WHEELS - (4) BR70x13 tires, fin-type wheels. Eric, 2973 after 5.

73 MOTOR HOME - 22' mobile traveler, 318 Dodge, 19,000 + mi, ps/pb, a/t, a/c, self cont, sleeps 6, excel cond. $6500 firm. Charlie, Ext. 4201, 234-8530.

65 BUICK LE SABRE - very good cond throughout, orig owner. $350. Sue, Ext. 3675, 473-6570 after 6.

72 PLYMOUTH WGN - 9 psgr, fully equipped, a/t, ps/pb, AM/FM radio, a/c, needs minor work. Asking $995. Don, Ext. 7611.

75 FORD - 4 dr sedan, rd, ps/pb, a/c, radials, rust-proofed, excel. $2495 or trade for van. Mike, 751-2149.

11½' TRUCK CAMPER - needs work. $300. 924-3936 after 6.

77 KZ-400 - crash & sissy bars, luggage rack, blue, 2 helmets, very well maintained. $1250. Bill, Ext. 7611.

72 CHEVY CUSTOM 10 PICKUP - 307 c.i., 3 spd, 8' bed, tonneau cover, super immac inside & out, body & paint perf. $2500. Fred, Ext. 4095.

68 CHEVY CARRY ALL PARTS - doors, glass, 400 trans, posi rear, 350 motor, needs work. 589-9103.

72 OLDS CUTLASS - 2 dr, a/t, ps/pb, good cond. $300. Bill or John, 736-1071 or 286-0619 after 6.

72 CHEVY NOVA - V8, 58,000 mi, radial tires, excel cond. $1500. 941-4127.

79 DODGE VAN - 6 cyl, std shift. 281-5498.

74 JEEP PICKUP - J10, AM/FM-8 trk, 4 w/d, 4 spd, good cond. $3800. 286-0795.

67 DODGE DART - new batt & alt, rusted but extremely dependable, great mpg. Ext. 3612/3009.

73 PONTIAC FIREBIRD - a/t, ps/pb, radials, good cond. $2300. 928-8522.

79 DATSUN PICKUP - 5 spd, a/c, cap, snows, reg gas. $4500. 473-9124.

HYDRAULIC JACK - Walker, lift a car on 4 steel wheels, 2-ton capacity. $50. Stan, Ext. 3284, 286-1062.

78 CHEVY VAN - 20,000 mi, 22 mpg, 6 cyl, custom int, wheels, radials, sunroof, AM/FM-8 trk. $4900. Bob, Ext. 3050, 581-0291.

70 CHEVY WGN - good mech cond. Best reasonable offer. Karl, Ext. 4192, 744-2461 after 6.

76 BLAZER - 4 w/d, 4 spd, new tires, shocks, 15 mpg, mint cond, 37,000 mi. $6500. 734-7584 after 6.

78 VW RABBIT - like new, transferrable warranty, price negotiable, must see. Ext. 2916, 331-2298.

13" SNOW TIRES - Datsun or Toyota, on rims, (2) used 1 yr. $15 ea. Ext. 3354.

79 HONDA HAWK - 400cc, new cond, 1000 mi, blk. 473-9180.

66 MUSTANG - new exhaust sys, new brakes, int good. Oonly $550. Sharon, 281-9105 Sunday only.

69 FORD GALAXY - excel mech cond. $395. Ext. 3922, 744-3235.

77 MERC MARQUIS WGN - all pwr, 18,000 mi, a/c, AM/FM, radials, 10 psgr. $4999. 473-2664.

AUTO PAINT SPRAY GUN - $75. Frank, Ext. 3898.

76 VOLARE - 2 dr, automatic, ps/pb, mint cond. 30,000 miles. $2,500. L. Green, Ext. 2944 or 473-2764.

Boats & Marine Supplies

11' SAILBOAT - 2-man, fiberglass hull over wood, 1 sail. Bargain. 289-0925.

22' GARVEY - glass over wood, self bailers, oak framed, console, excel. $1000. Dennis, Ext. 3050, 654-2076.

Miscellaneous

STEREO TAPE RECORDER- Concord mod 727, $100; stereo amp, turntable, mono tuner, $100. Jim, Ext. 4476.

19" ADMIRAL TV - color, table model, solid state, excel cond. $175. 744-3926.

DIN RM MIRROR - 52x40, excel cond, $45; foldaway cot, brass fp set, 2'x2'6" mirror, 2 lamps white glove bass w/brn flowers, 2-tier end tables & catching coffee table. Best offer ea item. Ext. 3139, 585-5256 after 6.

ROYAL DOULTON - china set, English Renaissance, (4) 5-pc sets, never used. $320. 924-0581.

23" B/W TV - old. $19. Ext. 4980.

FIREPLACE LOGS - ceramic gas, LP/nat gas, orig cost $130. Now $35. 286-1331 after 5.

COUCH & CHAIR - Early Am, Herculon matl, excel cond, must sell. $75 firm. 928-7745.

FORD CAMPER - 1971, self cont, cabinets, stove, sink, porta potti, carpeting. $3200. 265-0845.

ANTIQUE HUTCH - Early Am, 2 drs, 3 shelves. $135. Ext. 4253, 928-4926.

DISHES - lamps, apples, stereo, phono, others; if you need something, call – we may have it. 744-2332.

ELEC STOVE - GE 30", gold, window door, excel cond, 4 yrs old. $125. 331-2779.

19" COLOR TV - $120 or best offer. Ext. 7755, 744-2558.

BROILER OVEN - new cond, used 6 times. Cost $45, priced at $25. Ext. 4867.

FRANKLIN STOVE - good cond, w/stove pipe, grate & screen. $100. J. Skora, Ext. 2819, 744-9677 after 5:30.

HELMET - Bell Star 2, full face, 2 mos old. $80. Mike, Ext. 2903.

WARM MOUTON COAT - size 16, $45; 18-cup alum drip coffee pot, $8; guitar, $12, never used. 472-1585.

2-SLICE TOASTER - brand new. $9. 345-3183.

CONTENTS OF HOME - liv rm, bedrm, dinette set, all compl sets, also odds & ends. Porcaro, 732-7134.

REFRIG - RCA Whirlpool, 2 dr, bottom freezer. $100. 286-1855.

FIREPLACE SCREEN - brass top & bottom pieces, adjustable. $10. John, Ext. 3292, 286-1348.

BOY'S NAVY BLAZER - size 12, worn twice, orig $30; grey pants/tie. 751-2713.

B/W TV - 17" Zenith, old but in working cond. $10. Ext. 2497, 281-2767 eves.

BEDSPREAD & CURTAIN - Winnie-the-Pooh, hamper, toy box & wastebasket. $10 ea or $30 takes all. Ext. 4051, 286-3377 after 5.

(2) LIV RM CHAIRS - green plush, fully padded, very good cond. $25 ea. Ext. 4701, 271-2877.

DOG GROOMING TABLE - $20. Hank, Ext. 3848.

TABLE SAW - w/motor, 3 amp CB pwr supply, $25 ea; mobile slide bracket, $3; paperback mysteries, approx 100, $10/all. Lou, Ext. 4087.

HOOVER VACUUM - $10; vinyl recliner, $35; gate-leg table, $15; portable record changer, $15; all excel. Jack, Ext. 4087.

BABY ITEMS - walker, $7; deluxe Johnny Jump Up, $8; dog cage, 23"Hx17"Wx27"L, type used for air travel, asking $25. Ray, Ext. 4416.

ORGAN - electric cord by Estey, 72 balanced bass cords, many features, bench, bks, excel cond. $350. 475-8658.

MAYTAG GAS DRYER - saves money, excel operating cond. $75. 732-3073 after 6.

SLIDE PROJECTOR - new, timer. $125. Ext. 2403/3206.

20.5' SHASTA TRAVEL TRAILER - 1977, fully self contained, excel. 281-0804 eves.

LHASA APSO PUPPIES - AKC, shots, wormed, 8 wks old. 698-3546.

SEWING MACHINE - Morse super deluxe, zig-zag, #5100, foot pedal, tools, instructions. $69. Martha, 286-0478.

PELLET PISTOL - Crossman mod 38C CO_2, almost new. Sacrifice, $29. Bob, Ext. 4551.

SKI BOOTS - men's Caber, flow foam, buckle, used 2 seasons. $25. Irving, Ext. 2062.

LADIES COAT - size 14, rust color, suede-like cloth, man-made fur on collar, cuffs & hem, never worn. $35. George, Ext. 4289, 588-5228.

(4) TICKETS - Westbury Music Fair, Paul Anka, 8th row, April 19, 1980 at 6:30. Paid $64, asking $64. Ext. 4615.

TURNTABLE & AMP - Benjamin Miracord table, Electrovoice amp, $25; GE heavy duty washer, 2-spd, 2-cycle, 5-temp, like new. $125. Lucy or Tom, 924-8742.

FRANKLIN STOVE - like new, $125; Magic fan for airtights or stoves, $100. 286-0788.

POOL TABLE - Brunswick 8', regulation, w/access, used 3 times. $350. 698-8086.

RECORD CHANGER - Garrard 74M, Shure cartridge, very good cond. $35. Ed, Ext. 3567.

JUICER - Majestic veg/fruit, $90; wig, Elura blonde w/stand, $20; both never used. Ext. 2065, 981-1327.

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

MEDFORD - close to LIE, mother/daughter, all newly remodeled on ¾ acre incl buildable lot, upstairs 3 bedrms, DR/LR w/fp & w/w downstairs, eik, 1 bedrm, L/R, sep elec & heat. $53,000. Ext. 2671, 475-2769 after 5.

ROCKY POINT - 9 mi from Lab, 6 rms, bath, fully insulated, oil heat, s/s, alum siding, awnings, ref, w/d, dw, above-ground pool, 5 min walk to beach. Low 30's. 744-2332.

STONY BROOK - walk to LIRR, SUSB, ½ acre treed, 4 bedrms, 2 baths, cape, eik, den, DR/LR, fp, 2-car gar, screened patio. $75,000/negotiable. Ext. 4853.

EAST MORICHES - 3 bedrms, w/w, s/s, self-clean oven stove, refrig, w/d, freezer, bsmt, 2-car gar, fenced yard, storage bldg w/cement floor & elec, ⅓ acre, low taxes. $37,500. Ext. 3771, 878-1471.

MT. SINAI - 3 bedrm ranch, cath ceiling L/R w/fp, w/w, 5 appl, 2 baths, gar. $35,000. Bill, Ext. 3369, 929-6442.

PORT JEFFERSON - Harbor Hills, 3-4 bedrm ranch, possible mother/daughter, treed ⅓ + acre, fp, dead-end st. Reduced to $69,000. Ext. 4504, 473-1523, 928-0483.

SHOREHAM - prime loc N of 25A, 4 bedrm ranch, DR/LR w/fp, country kit, den, ent hall, 2 baths, lg deck, 5 appl, 2-car gar, ½ acre, beach rts, must sell. $59,900. Ext. 3462, 744-8449.

ROCKY POINT - lg mod ranch, 4 bedrms, 2 baths, 2-zone gas heat, central a/c, walk to beach, moderate taxes. $55,000. Ext. 3596, 821-1039.

BELLPORT SOUTH - walk to beach, golf, tennis & shops, beautifully planted 1 acre, garden, fruit trees, playhouse, excel cond, 4 bedrms, 1-½ baths, gas heat, city water. 286-2320.

SHOREHAM - 3-4 bedrms, LR/DR, 2 baths, all gas, ½ acre, stockade-fenced back yard, S/WR Sch Dist. $43,000. Ext. 4391, 744-2444.

GLENS FALLS - 1-½ story colonial style, 3 bedrms, 2 baths, country kit, gas heat & hot water, near downtown. $24,500. Ext. 2501, 765-2953.

MASTIC BEACH - 3 bedrm ranch, corner lot, roofed patio, pleasant location near water. Low 30's. 281-7531.

BELLPORT - south, prime loc, old-fashioned charm, 9-rm, 2-story colonial, oak & tile fp, D/R duplex den, 4-5 bedrms, 3 baths, 2-car gar, gas heat, .6 acre. $55,000. Anne, Ext. 3404, 286-3764.

CENTER MORICHES - charming, old but mot, spacious 5 bedrms, 3 baths, 2 fp, compl apt att, full bsmt, on 1-¼ acre of waterfront prop. For appt & details, call 878-0642.

BELLPORT SOUTH - colonial ranch, L/R, D/R, vaulted 15' ceilings, fam rm w/built-in birch bookcases & sliding doors to 30' Astro-Turf patio, 3 bedrms, new eik, 2-car att gar, out bldg, prof landscaping, brick ent patio, assumable 8-¼% mtg ($75 transfer cost). $34,000. 286-3732.

BROOKHAVEN HAMLET - 3 bedrm, custom ranch, 1½ baths, bsmt, ½ acre, landscaped, many flowers, 50's. 286-3934.

For Rent

BELLPORT - 2 bedrm house, L/R, att gar, screened-in porch, bsmt. $275 + util. Ext. 3069, 286-1974.

RIDGE - 3 bedrm L-shaped ranch, lg L/R, eik, full bsmt, 5 min from Lab, will rent for 6 mos. $400/mo + util. 981-5993 after 6.

FLORIDA - ¾ mi from Gulf in Englewood, yr-round, unfurn, 2 bedrms, 2 baths, 2-car gar, a/c, avail April 1. $400/mo. Ext. 3570, 744-9746 eves.

SHIRLEY - furn rm, 5 min from BNL, single only. Ext. 2548, 399-0862.

SELDEN - 4 bedrm house, lg kit, lg L/R. Ext. 7633, 477-0196.

BELLPORT - furn rm, prvt ent, cooking facil, all util. $175/mo. Ext. 3521, 286-1688.

ROCKY POINT - prvt house, 15 min from Lab, 2 blocks from beach, furn/unfurn. $275/mo + util. Mike, Ext. 2501, (212) 833-1186.

WADING RIVER - 2 rm, ½ bath apt, util incl. Call after 2:30 pm, weekends 9am-5pm, 929-4662, 929-6293.

MANORVILLE - 1 bedrm apt w/view, a/c, dishwasher, fp, 2 yr lease. $330/mo + security w/club membership free. Pat, Ext. 3460, 878-8935.

POCONO'S - chalet, fp, sleeps 6, ski Tanglewood, snowmobile nearby, near Cove Haven. $125/weekend. Ext. 4551, 289-2159.

RIVERHEAD AREA - 3 bedrm house, fin bsmt, no util, located near a lake, many appl, avail April 1. Ext. 4207, 727-2368 after 8 pm.

RIDGE - 2 bedrm house, furn, fenced, big bath, prvt, low util, Lake Panamoka, close to beach & Lab. $250/mo + util. Ext. 2289, 744-6413 days, 744-8832 eves.

EAST PATCHOGUE - 3 bedrm, unfurn, f/p, water view, lg yard. 17 min. from Lab. $300/mo + util. Ext. 3482.

Wanted

HOME - for German short hair pointer & blk Labrador Retriever. Free. Bob, Ext. 2503.

APT TO RENT - W. Patchogue area, for woman w/6 yr old child, furn/unfurn. Terri, Ext. 2484, 289-3684 after 5:30.

CAMPER TO RENT - for 2 wks in April, trip to Florida. Pam, 581-7656.

PROPELLER - for 40 hp Johnson, good cond, reasonable. Carl, Ext. 3499, 928-6944.

HOME - for altred cat, grey tabby, has all shots. JoAnn, 744-2821.

TV ANTENNA ROTATOR - heavy duty, w/controls, reasonable please. B. Sanchez, Ext. 3848, 698-3145.

LAWNMOWER - rotary 20", in good cond, Briggs & Stratton motor preferred. 286-8724.

FOR PARTS - wrecked VW Rabbit (Scirroco or Dasher), manual shift. Bob C., Ext. 2501, 765-2953.

WANTED - live in housekeeper. 286-1592.

2 TRAVELERS - to join group interested in rural health programs traveling to China (Canton, Chengdu, Chungking, Wuhan, Shanghai), May 3-25. $3500 covers all expenses r.t. from San Fran. P. Vineyard, 286-0269 or M. Whitman, MY 2-6635 eves.

Car Pools

CORAM - form or join car pool. Alan, Ext. 2252.

MATTITUCK - to join existing car pool as 4th or 5th driver. B. Stars, Ext. 4278, 298-9648 eves.

PATCHOGUE - driver to compl car pool. Bob, Ext. 3309.

PAYING RIDER - Lake Ronkonkoma, very near LIE Exit 60 & 61. Pat, Ext. 3148/3146.

Services

TAXES- prepared by tax consultant, your home or mine. Reasonable. John, 732-2472.

FIREWOOD - ½ cord seasoned oak logs. $50, you pick up. 924-3236.

EXPERT TUTORING - by certified teacher in my home all elem subjects, HS math, French, German. $10/hr. 941-4328.

PROFESSIONAL INCOME TAX SERVICE - by experienced preparer. Jack, Ext. 7942, 864-2236.

LEARN CHINESE - from Berlitz teacher, private or group lessons. Ext. 4157.

JEWELRY REPAIR - gold & silver jewelry repaired & polished. Dan, Ext. 3289.

FIREWOOD - split, seasoned oak, 4'x16'x18". $110 delivered. 924-4284 after 5:30.

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.