

Nature's Bounty In A Clean Fuel

Air and seawater, the world's most abundant commodities, contain the key components of what could be the fuel of the future.

Meyer Steinberg, DAS, and his collaborators have devised a method of extracting carbon dioxide from either air or seawater and combining it with hydrogen from plain water to produce methanol. The technique simulates photosynthesis, the process by which plants use solar energy to combine water with carbon dioxide to form carbohydrates and oxygen. Methanol, the major component of fuels used in racing cars and of "dry gas," is a universally acceptable fuel and can be readily burned in any engine, said Steinberg.

The beauty of the technique lies in its independence of fossil fuels, and its reliance on already known chemical and physical processes. The difficulty is in developing the technology and determining the economic feasibility of the method. The production and use of methanol by this technique are non-polluting. It is a renewable resource in that the water and carbon dioxide taken out of the environment to make methanol are put back for reuse when it is burned.

Steinberg proposes using nuclear power rather than fossil fuels as a source of energy for the process. "At one time it was said that almost anything could be made using fossil fuels, air and water. What I am saying is that almost anything can be made using nuclear power, air and water," he said. This method of producing methanol being called the Nusylf Process, an acronym for nuclear synthesis of liquid fuel. "Although the Nusylf Process depends heavily on nuclear power it would eliminate the environmental problems associated with strip mining, oil spills, and sulfur pollution and the hazards of coal mining," said Steinberg.

The highest hurdle that must be straddled to make the Nusylf Process effective is determining a way of obtaining carbon dioxide in sufficient quantities. After looking at eight different methods of extracting carbon dioxide from air and one from seawater, two were determined the most economical - from air using a dilute solution of potassium carbonate as a solvent and secondly from seawater.

Seawater is a natural reservoir of carbon dioxide, in the forms of carbonates, bicarbonates and dissolved carbon dioxide. Although carbon dioxide is more concentrated in the atmosphere, there is a greater quantity in the oceans. It has been estimated that there are 10 trillion tons of carbon dioxide in the air and 100 trillion tons in seawater. By heating seawater, this resource can be distilled out and the water returned to the oceans.

Retrieving carbon dioxide from air involves one more step, it must be absorbed by a solution in order to be distilled and collected. Water was found to be the most economical absorber of carbon dioxide, but not quite as effective as a dilute solution of

potassium carbonate. Steinberg suggests building "absorbing towers" in which the dilute potassium carbonate is poured down at the same time as air is bubbled up. The solution would absorb the carbon dioxide and then would be funneled to another tower where it would be heated and the carbon dioxide distilled out. The dilute potassium carbonate is then reused.

Once carbon dioxide is collected, it is mixed with hydrogen obtained by electrolyzing water. Through electrolysis, water is split into its two constituents - oxygen and hydrogen. While the hydrogen is used to produce methanol, the oxygen can either be released into the atmosphere or collected and sold.

The carbon dioxide and hydrogen, once combined, are passed over a catalyst which transforms them into methanol. Using this process, Steinberg estimates a production of 25,000 barrels of methanol a day with a flow rate estimated at 200 million gallons an hour for seawater or 100 million gallons an hour for dilute potassium carbonate. Based on 1974 figures, the cost to the manufacturer for methanol would be equivalent to the cost of gasoline at 40 cents a gallon. "As fossil fuel prices go up, this process becomes more economical," said Steinberg.

Methanol is an environmentally acceptable option to fossil fuels. When burned, the major exhaust products are carbon dioxide and water. "The carbon balance is kept in the atmosphere, avoiding the greenhouse effect," said Steinberg. If methanol can be used as a gasoline substitute, it can also replace natural gas and oil for residential and commercial and transportation purposes.

Steinberg proposes building methanol production plants next to nuclear power reactors. In this way, when the consumer demand for power is low, the power produced by the reactor, which would otherwise be wasted, could be used to produce hydrogen for methanol synthesis. The electrolysis of water to produce hydrogen is the most energy consuming part of methanol production. If hydrogen were produced during off-peak hours, it could be stored in the plant as a metal hydride or as a compressed gas until it was needed.

Besides nuclear power, Steinberg is looking at other sources of power for methanol synthesis, including coal and a hybrid system, using both coal and nuclear power. He is also investigating other sources of carbon dioxide such as municipal wastes (garbage).

In the near future he plans to study the process in more detail, both the engineering design and economic practicality. Further, he would like to make pilot plant tests for extracting carbon dioxide from the atmosphere and seawater.

Along the lines of a methanol plant, Steinberg envisions the production of ammonia for fertilizers by extracting nitrogen

(Continued on page 3)



Steve Amoretty (right) translates for Jack Jensen (left) and three visiting Soviet scientists (left to right) Igor Rybin, Professor Shota Lutidge and Dr. Evgeniy Blinkov.

3 Soviet Experts Spend Week At Lab

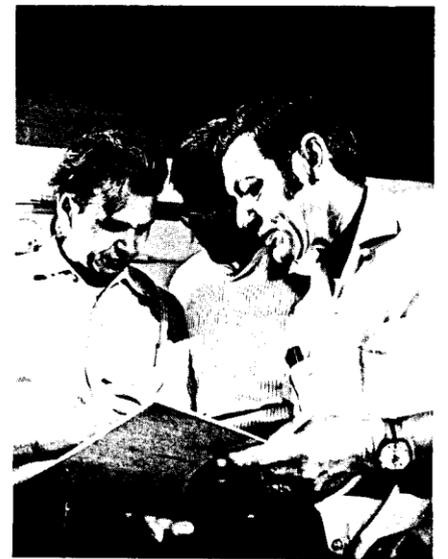
Three experts on power transmission from the Soviet Union are spending two weeks in the United States, dividing their time between Brookhaven National Laboratory and the Linde Division of the Union Carbide Corporation.

Dr. Evgeniy Blinkov, head of the power transmission project at the Krzhizhanovsky Power Engineering Institute, Igor Rybin and Professor Shota Lutidge spent this week at the Lab learning about BNL's superconducting power transmission project and participating in a series of related experiments.

The visit is the result of a 1974 agreement between the Soviet Union and the United States to cooperate on superconducting power transmission research. Since the agreement was signed there have been several exchanges of scientists between the two countries for short periods of time.

The three Soviet scientists were welcomed to the Lab on Monday by Dr. Brian Belanger, Program Manager for power transmission in the Conservation Division of ERDA. On Tuesday they entered into technical discussions with BNL staff members about the power transmission project. Steve Amoretty, Technical Information, has been the translator throughout the visit.

The highlight of the visit came on Wednesday, when the Soviets witnessed voltage being run for the first time through a 75-foot length of cable inside an insulating dewar. The cable was built to BNL specifications by an industrial high voltage cable company to test the performance of electrical insulation at temperatures appropriate for a superconducting cable - about 7° K (-446° F). A series of tests were run to determine voltage effects on the cable system. Preparations for the tests began at the end of last week when the power transmission group first started cooling down the cable.



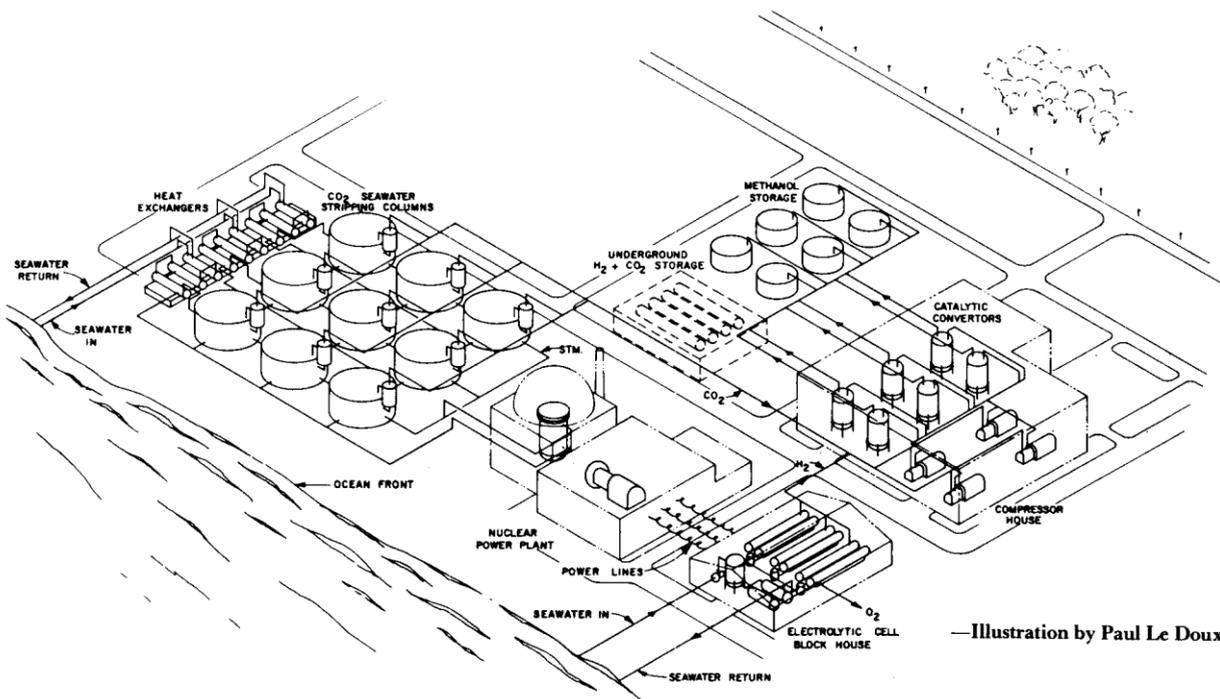
Dr. Evgeniy Blinkov (left) illustrates a point for Jack Jensen (right) while Steve Amoretty looks on.

On Thursday, the visitors conducted individual experiments, which included testing a 150-horsepower screw compressor used for helium, taking various measurements on a small length of cable, and measuring stray fields in a coaxial cable sample with the aid of a computer.

The visitors will be taken on tours of various facilities at the Lab today and will wrap up their visit with a beach party on Fire Island on Saturday.

In three weeks, Jack Jensen, Accelerator, will go to the Soviet Union to attend a meeting of the US/USSR Committee for Technological Change in the Field of Superconducting Power Transmission. The Committee, of which Jensen is a member, negotiated the 1974 agreement to cooperate on superconducting power transmission research. It is made up of eight U.S. scientists, representing the ERDA national laboratories, industrial laboratories, the electric power industry and the superconducting material manufacturers. While in the Soviet Union, Jensen will also participate in a conference on the technical application of superconductivity.

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—Illustration by Paul Le Doux

An artist's conception of what a methanol production plant, using seawater, might look like.

Appalachian Music Concert

Kathleen and Jan Oosting, natives of America's Southern Appalachians will bring a program of traditional songs of that area to the stage of Berkner Hall on Wednesday evening, August 20, at 8:30 p.m. The program will be sponsored by BERA's concert committee. Admission will be \$3 for adults and \$2 for students and persons over 65. A similar evening two years ago with these two popular local artists was an outstanding success.



"Is this intellectual?" the pussycat (Cathy McGuinness) asks the owl (George Loizides) during an intimate scene from the Dinner Theatre presentation that will be given at the Brookhaven Center on September 19 and 20.

Dinner Theatre First — The Owl And The Pussycat

A merry, adult farce-comedy about education that has nothing to do with a school will be the first offering of Dinner Theatre at BERA's Very Special Event on Friday, September 19 and Saturday, September 20.

The Owl and the Pussycat, Bill Manhoff's play that ran on Broadway for over a year, and was then made into a popular movie, will have George Loizides and Cathy McGuinness in its starring roles. George plays the part of an owlish young man who likes to think he is interested only in things of the mind. Cathy portrays a lively sex kitten whose interests have always been in things of the body. Cathy and George are not only the stars of the production but also comprise its entire cast. The tug of war over intellectuality versus physicality is restricted to two participants - except for some off-stage telephone calls from the young man's employer who wants to

know why he hasn't come to work, and assorted knocks on the wall from an off-stage neighbor in an adjoining apartment complaining of the uproar.

Lyne Moss directs this comedy which is produced by Vinary Productions, about the hilarious confrontation of a lively tart who is barely literate, and a self-righteous puritan who insists he is an intellectual. Len Price designed the scenery which represents the owl's San Francisco garret where their mutual education proceeds.

For dancing after the show, on Friday, September 19, will be Chappy and his Chaps. Saturday's show will be followed by dancing with the Serenaders with Ann Mauro. Ticket sales and reservations for all four Dinner Theatre performances will start on Monday, August 25. No reservations will be taken before that time.

Save . . . Do It Yourself

Beginning September 1, New York Telephone will start charging for directory assistance requests within New York State. The purpose is to reduce the growing volume of unnecessary calls to directory assistance. The latest figure for providing this service is \$100 million a year. This makes it unfair for everyone to share in the expense, since some people use this service more than others.

You will get 30 cents credit on your phone bill plus three free requests each month. So the first six directory assistance calls will be covered, but starting with the seventh each request will increase your bill by 10 cents.

This plan applies to each line, no matter how many extensions. If you make zero to three requests a month, 30 cents is taken off your phone bill. If you make four requests, the saving is reduced to 20 cents; five requests and the saving is down to 10 cents. If you make six requests there is no savings, and each request after the sixth will increase your bill by 10 cents.

There will be no charge for calls placed to out-of-state directory assistance bureaus, for numbers that customers have asked not to be given out or if you are given a wrong number. Also no charges will be made for requests from coin phones or from motel, hotel or club phones. Visually or physically handicapped persons may obtain applications for exemption of charge.

In Memoriam

Ann (Angela) D'Esposito died on August 8, 1975, as the result of a tragic car accident. She began working at the Lab on November 30, 1959. She was an executive secretary to Charles Meinhold in the Health Physics and Safety Division.

Miss D'Esposito was a long-time Suffolk County resident. She received an A.A.S. degree from Suffolk County Community College. She is survived by her parents, Mr. and Mrs. Frank D'Esposito, and her brother Dominic.

New Affirmative Action Head



On Tuesday, August 12, Laboratory Director George Vineyard announced that Harvey Thomas will become Assistant to the Director for Affirmative Action on October 1, 1975. Thomas, a development engineer in the Accelerator Department, has been with the Laboratory since 1954. He has been coordinator of Affirmative Action in the Accelerator Department since 1970.

Art Exhibit Planned

The BERA Art Committee will sponsor an exhibition of contemporary art in Berkner Hall from August 27 through September 12.

The show will reflect a wide range of media - painting, drawing and sculpture - and many different approaches to art ranging from realistic painting to abstract sculpture.

The works will be exhibited courtesy of the Benson Gallery in Bridgehampton. All of the artists are residents of Long Island and have been invited to the opening of the exhibition on August 27.

Everyone is invited to the opening to meet the artists and speak with them about their work. On that evening the Art Committee will hold a buffet dinner at 6 p.m. in Berkner Hall. Those interested in coming to the dinner should call Ginnie Sayre, Ext. 3364, for reservations.

Off-Site

Music Under The Stars

Summertime on Long Island is no time to wonder where to go or what to do. There are various inexpensive concerts, dances, festivals and theatre presented throughout the summer months for everyone to enjoy. The Council of the Arts of Brookhaven Town offers a Summer Music Series as well as a number of special Bicentennial events. Unless noted, all performances will begin at 8:15 p.m. Admission is free; bring chairs or blankets.

On Saturday, August 16, an all Long Island Barbershop Quartet Competition will be held at Bald Hill Ski Bowl in Farmingville at 8 p.m. Also at the Ski Bowl on Sunday, August 17, the Smith Street Society Dixieland Band will be performing. The Reno-Harrell Bluegrass Show will be at Mastic Beach Fire Department field on Monday, August 18, at Bald Hill Ski Bowl on Tuesday, August 19 and at Cedar Beach in Mt. Sinai on Wednesday, August 20.

On Sunday, August 24, a Rock n' Roll Revival by the Harry Hepcat Boogie Woogie Band will be held at the Ski Bowl. The Billy Mitchell Jazz Revue will be performing at Mastic Beach Fire Department field on Monday, August 25, and at Cedar Beach on Wednesday, August 27. On Tuesday, August 26, the Stony Brook Jazz Band will be at Cedar Beach and the Medford Choral Society will be at the Yaphank Fire Department field.

The American Revolution Privateer "Rattlesnake" will be docked at the Sandpit Marina in Patchogue on September 20 and 21. Weather permitting, the public may visit the ship from 10 a.m. to 4 p.m., but boarding will not be allowed.

The Colonial Fife and Drum Muster will be performing at the Setauket Village Green on Saturday, September 20, at 2 p.m. and on Sunday, September 21, at the Manor of St. George in Mastic at 2 p.m. Admission is free.

Enjoy an old-fashioned "Sunday in the Park" on October 5, from 10 a.m. to 4 p.m. in the Holtsville Town Park. There will be an art, crafts and antiques on exhibit and a free performance by the Suffolk Concert Band at 1 p.m. An antique auto Show and Art Exhibition, with no entrance fee, is scheduled at Holtsville Town Park on Sunday, October 19, from noon to 4 p.m.

The Office of Cultural Development

(OCD) of Nassau County, is planning the presentation of their fifth annual Jazz Festival. It will be held in the air-conditioned domed auditorium of C.W. Post Center of Long Island University, located in Brookville, on Sunday, August 17, at 7 p.m. Spanning three generations of main stream jazz, the festival will headline Jazz Hall of Famer Teddy Wilson. Many other well known jazz artists will be performing in the festival, which according to OCD "could easily become one of the most historic jam sessions in the history of jazz."

On Saturday, August 23, the OCD will be presenting the fully staged production of Puccini's "Turandot" by the Opera Company of Nassau. Curtain time will be 8 p.m. at the C.W. Post Center and tickets will be \$3 for general admission. For additional information contact the OCD at 484-9333.

The International Art of Jazz, Inc., (IAJ), a non-profit organization with offices at the State University of New York at Stony Brook, is sponsoring free concerts this summer in various locations. The IAJ Ensemble with Carrie Smith will move out to the Shorefront Bandshell in Patchogue, on Sunday, August 24, at 8:15 p.m., and then to Westhampton Beach High School on Friday, August 29, at 7 p.m. Also, Dick Hyman's East End All Stars will perform on the Wharf in Sag Harbor at 7:30 p.m. on Wednesday, August 27. The concerts are free. Bring chairs or blankets. Information about IAJ concerts may be obtained by calling 246-6125.

The Children's Music Theater of Long Island is presenting a Festival of Children's Theater during the last two weeks of August. "Beauty and the Beast" will be shown on Friday, August 22, at 11 a.m. and 1 p.m.; "Chanticleer" will be performed on Sunday, August 24, at 1 p.m. and 3 p.m.; and "Annabelle Broom," the unhappy witch, on Thursday, August 28, at 11 a.m. and 1 p.m. The program continues with "Little Red Riding Hood" on Friday, August 29, and "Rumpelstiltskin" on Saturday, August 30, at 11 a.m. and 1 p.m. All shows will be at the Slavic Cultural Center at 709 Main St. in Port Jefferson. Admission is \$2.50 or \$12 for all six shows. For reservations call 549-8955.

—Catherine Argyros

Summer Study



James Cotton, a summer student working in the Medical Department with Dr. Harold Atkins, prepares to inject an anesthetized rat with a radioisotope. Cotton is a senior at Jarvis Christian College in Texas, his home state. After graduation he hopes to enter pharmaceutical school. He has become so interested in nuclear medicine while working with Dr. Atkins that he plans to specialize in nuclear pharmacy. Last Spring, Cotton participated in the Semester Student Program, at which time he did research on bacteriochlorophyll proteins under John Olson in the Biology Department.

BNL Golfers Score

The BNL Golf League sent six golfers to the LIRA Tournament, played July 29, at the Huntington Crescent Club. Ed O'Connell and George Korhut represented BNL in the championship flight and Bob Feindt, Vinnie Racaniello, Jack Detweiler and Peter Bond played in a "social" foursome.

In Brookhaven's first appearance at the tournament O'Connell (with a 77) and Korhut (with an 80) tied for first place as a team with a total of 157. A sudden death playoff with the team from Grumman went three extra holes before the Grumman team triumphed. There were many holes where "if" a putt had fallen, Brookhaven would have won, but we will have to settle for second place until next year.

The scores of the other BNL golfers were P. Bond, 86; V. Racaniello, 89; B. Feindt, 92; and J. Detweiler, 102.



George Korhut (left) and Ed O'Connell (right) recently won trophies in a Long Island golf tournament.

Tennis Tournament News

This year's tournament, one of the largest we've had, was also one of the most exciting. The men's singles finals was one of the best finals seen in years, with young Alan Rosenberg confidently handling veteran champion John Elmore's explosive serves to win a hard fought and at times brilliantly played match 6-4, 7-5.

In ladies' singles Shizui Iwai's steadiness and control won over a very hard hitting and game Chris Saitta by the score 6-2, 6-2. It was a well played match with Iwai's slight edge in control the deciding factor.

For the first time at BNL a ladies' doubles was held. The finals was one of the best ones in the tournament. It pitted former BNL ladies' champions, Mary Jane Stangby and Marta Kevey against Shizui Iwai, our reigning ladies' singles champion, and Anna Lee Luhman, a relative newcomer to the game. The Iwai-Luhman team displayed an aggressive, all court game, winning many points with placements from a strong net position. They won the match by the scores 6-2, 6-4.

The men's doubles finals for the Merkle Cup was a hard fought three-set match between the veteran team, and Merkle Cup winners of six out of the last seven years, Auskern and Kevey, and men's finalist and champion for the last two years John Elmore and his partner, perennially high seeded and always dangerous Tom Koetzle. The Auskern-Kevey duo did it again, 6-3, 4-6, 6-2. For the first two sets it appeared no one really wanted the match - most games being won by unforced errors. But in the final set Auskern-Kevey came alive to aggressively take the championship.

Finalists for the mixed doubles are two very strong teams: Chris Saitta-John Elmore (they beat the Schonbergs in the semis) vs. Iwai-Rosenberg, who beat the Luhmans in the other semis.

Don't forget, tennis ladder play continues all summer and fall. Keep challenging.

The tennis committee would like to thank the BNL community for the patience and cooperation displayed during those periods when courts were pre-empted for tournament play. The committee would also like to thank those volunteers whose arms we twisted to be linesmen and scorekeepers at the finals. Speaking of volunteers, we need a few who are willing to work. The more help we have, the more tennis activities we can undertake.

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Arrivals & Departures

Arrivals

Jacob Gilat Chemistry
Edward W. Heins Physics

Departures

Dale W. Gassaway Photog. & Gr. Arts
George R. Hodge Physics
Dale A. Miller Accelerator

Tug Of War At The Pool

"Pull, Pull!" This was the cry at the swimming pool last Friday as boys and girls of all ages competed in the BERA summer recreation program's special Tug of War event. A long rope was stretched across the pool, and grunts and groans were heard before a loud splash of water as one team after another was pulled into the deep six by the victorious squad of Paul Tinaca, Mike Greenhouse, Manju Chikkappa, Ken Greenhouse and Kathy McTague.

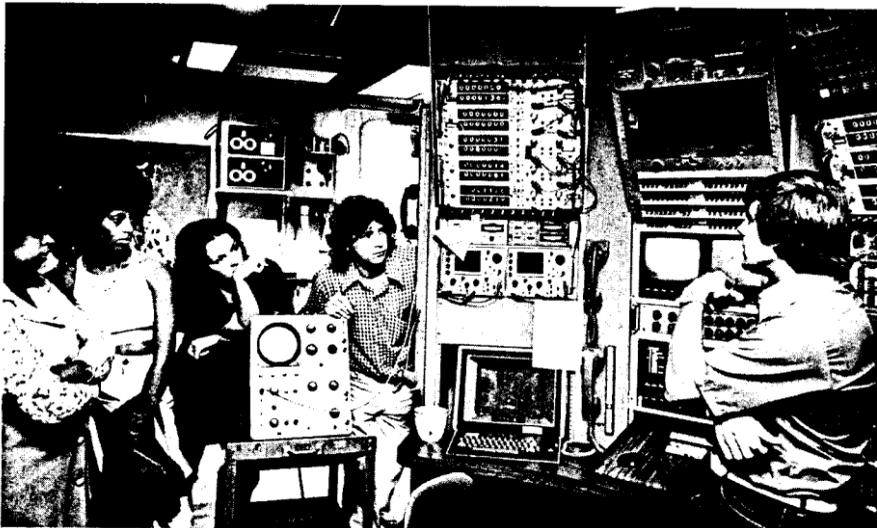
Meanwhile, at the low end of the pool, smaller children were enjoying the Ping Pong Ball on a Spoon Race. In this event the little Lab family members were required to keep a ping pong ball on a plastic spoon as they raced each other across the pool. Fun was had by all, and winners included Gregg Doxee, Sharon Emery and Mary Crystal.

Golf League News

The July 31 tournament, which was held at the Spring Lake Golf Course, was a success.

The first place winner of the Low Gross Event was George Korhut; Ed O'Connell placed second. Tom Iarocci and M. Kinney tied for first place in the Low Net Event. M. Kinney won Closest To The Pin, and Ed O'Connell won the Longest Drive.

Youth On Campus Tour AGS



Bill Cahill, Accelerator, explains some of the equipment in the AGS main control room to a group of Youth on Campus participants.



Milton Edwards, a Youth on Campus, tilts to glance at a computer printout while touring the AGS.

BNL's Archery Team



The members of the BNL Archery Team (from left to right) are: Joe Baurnefeind, Carl Cantera, Bob Lundgren, David Schweitzer, Lou Nicolosi and Don Schweitzer.

Archers' Triumph

Even the National Field Archery Tournament did not intimidate the BNL archers as we extended our string of successes at Jay Peak, Vermont. Joe Bauernfeind found his mark with 468 out of 476 arrows. This incredible feat beget him a bronze medal in the championship flight and national recognition.

As promised in a previous article the writer also came through with a silver medal in his division, allowing the gold medal to slip through his fingers by 5 points out of a total of 2552.

David Schweitzer, son of Don, received a bronze medal in the youth division. Even though they shot well, Bob Lundgren, Don Schweitzer and Lou Nicolosi did not qualify for medals.

The challenges are not yet over - the weekend of August 9, we are once again seeking competition. This time at Watkins Glen for the New York State title. No firm promise, but maybe this time we may come back with a state championship.

—Carl Cantera

Benefit Program Booklet

During the week of August 11, a new booklet describing the AUI benefit program was mailed to the home address of all active and retired employees. If you did not receive your booklet, please call R. Schonberg, Ext. 2881.

Track And Field Day

Enthusiasm for the Olympic Games runs no higher than did the excitement of Track and Field Day for the children of the BERA summer recreation program last week at the recreation building.

The fifty yard dash, the sack and wheelbarrow races, the marathon and the shot putt were special events featured at this affair.

Parents and friends cheered as counselors Rich Parsons, Barbara Smalle and Mary Grace Lazzaro judged the keen competition. The children worked very hard for the trophies and ribbons which were awarded at the end of the day.

Next Wednesday, Aug. 20 at 7 p.m. is the BERA Water Carnival at the swimming pool and next Friday, Aug. 22 is Monster Day at the recreation building.

Clean Fuel

(Continued)

from the atmosphere. Similarly, synthetic food production could be attained by capturing carbon from the atmosphere, the major building block of protein and carbohydrates.

Steinberg will present all these possibilities to the scientific community on Wednesday, August 20, when he delivers a paper at the Intersociety Energy Conversion Conference (IECC) to be held in Newark, Delaware. The conference is being jointly sponsored by ten different professional societies including the American Institute of Chemical Engineers, the American Nuclear Society and the American Chemical Society.

Collaborating with Steinberg in his investigation of synthetic fuels have been Vi Duong Dang, DAS, and Seymour Baron, Vice President of Burns and Roe, Inc., an architectural engineering firm.

Cafeteria Menu

Week Ending August 22, 1975

| | |
|--------------------------------------|-----------------|
| Monday, August 18 | |
| Corn Chowder | |
| Beef Liver & 1 veg. | 1.05 |
| Scrambled Eggs, Sausage & fr. fr. | 1.05 |
| Tuesday, August 19 | |
| Beef Noodle Soup | |
| Knockwurst & Sauerkraut | 1.05 |
| Baked Lasagna & 1 veg. | 1.15 |
| Wednesday, August 20 | |
| Cream of Potato Soup | |
| Beef Chop Suey on Rice | 1.05 |
| Chuck Wagon Special | |
| Cup of Soup or Juice | |
| ½ lb Beef Burger | |
| Baked Beans, French Fries, Cole Slaw | |
| Roll & Butter | |
| Plain Jello or Ice Cream | |
| Small Beverage | \$1.87 plus tax |
| Thursday, August 21 | |
| Chicken Vegetable Soup | |
| Cheese Ravioli & 1 veg. | 1.00 |
| Roast Chicken & Stuffing | 1.10 |
| Friday, August 22 | |
| Clam & Celery Soup | |
| Spaghetti w/Clam Sauce | 1.00 |
| Breaded Pork Chop & 1 veg. | 1.25 |

Classified Advertisements

Placement Notices

Each week the Personnel Office lists personnel placement requisitions, currently being processed. The purpose of these listings is, first, to give notice of all non-scientific staff positions being filled and, second, to give employees an opportunity to request consideration for themselves through the Personnel Office. In filling vacancies, the Laboratory's objective is to give first consideration to present employees, as follows: employees within the immediate group having the vacancy, employees within the department or division, employees within the Laboratory as a whole.

For further information regarding a placement notice, or to request consideration for an available position, contact Supervisor, Personnel Placement & Development, extension 2874 or 2882.

162. TECHNICIAN - A.A.S. degree in electronics or equivalent with two years' experience on solid state systems. Computer background desirable. Occasional shift work. Accelerator Department.

163. TECHNICIAN - A.A.S. degree in electronics or equivalent with two years' related experience. Occasional shift work. Particle Detector Group. Accelerator Department.

164. RESEARCH SERVICES ASSISTANT - Assignment involves work in the greenhouse and in waste water recycling and acid rain programs. Must have valid driver's license. Department of Applied Science.

165. DATA SERVICES ASSISTANT - Key punch experience necessary. Neutron Cross Section Group. Department of Applied Science.

166. RADIOPHARMACIST - Minimum B.S. degree in pharmacy or equivalent with training and experience with training and experience in radiopharmacy. New York State License required. Medical Department.

167. TECHNICIAN - A.A.S. degree in art or equivalent plus some experience and working knowledge of LeRoy system desirable. Graphic Arts Illustration, Photography & Graphic Arts Division.

168. TOOL AND INSTRUMENT MAKER (Group Leader) - Central Shops Division. Application Deadline: August 25, 1975.

Auto & Auto Supplies

66 CHEVY - Station wagon, rebuilt transmission, ps. \$500 or best offer. Ed Gill, Ext. 4662, 473-8716.

RIMS - (2) 13", \$3; (2) 14" Ford Mustang. \$5. O. Booker, Ext. 4719.

73 CHEVY TRUCK - ½ ton stepside, c-10, 33,000 mi. \$1900. Pat Jencius, Ext. 3336.

71 MOTORCYCLES - 200 cc Yamaha, low mi, \$332; 50cc Jawa, low mi. \$100. Dick, 589-9103.

67 FORD SUPER VAN - New tires, brakes & auto trans, big six (1970), clean, ideal for camper. Tom, 289-8323.

TIRES - Uniroyal G79-14 white walls, fair cond. \$20 for 2. R. Pynn, Ext. 3927.

72 OLDS TORANADO - 34,000 mi, excel cond. 588-9039.

TIRE - 650-13", good cond. \$10. Susan, Ext. 3609.

72 MERC MONTEGO - Good cond. \$2000. 751-1912 eves.

68 FORD - Station wagon, excel cond. Best offer. Ext. 4876.

66 CJ5 JEEP - New paint, heater, bucket seats, roll bar, snow tires, chrome wheels. 289-6482.

54 TRIUMPH - TR2 classic 2000 cc, new water pump, brakes, interior, battery, recent tune-up. Asking \$2000, make offer. 543-7741 eves.

TIRES - Uniroyal G78-14, fair cond. \$15 pair. Pynn, Ext. 3927.

69 AMBASSADOR DPL - Ps/pb/ac, vinyl top, steel radials, good cond, returning to Europe. \$850. Pynn, Ext. 3927.

NEW CHRYSLER TRANSMISSION - & torque convertor, name your price. Ext. 4604.

TIRES - E70-14, 3 tires, 2 in excel cond. Mike, Ext. 3658.

72 FORD RANCH WAGON - Excel cond. \$1700. George, 929-4818.

68 VW - Body fair, extra rims & tires, good transportation. \$300. 724-6661 eves.

72 CHRYSLER - Newport Royal, 2 dr hdtp, 38,000 mi, good cond. \$1895. Ext. 2876, 878-1895 eves.

TRUCK TIRES - 8-75 x 16.5 & 8-00 x 16.5, new recaps. Ken, 289-8212 eves.

72 CAD - Sedan DeVille, full power, low mi, new tires, good cond, blue. 744-8949.

67 CAD - Coupe DeVille, full power, interior good, needs body work. 744-8949.

VW PARTS - 69 Fastback seats, \$30; trans axle, \$75; 69 bus trans axle, \$100. Dick, 589-9103.

73 SUZUKI GT - 185K, street bike, excel cond, 7000 mi, windshield, safety bars, carry rack. \$600. 588-5833.

67 CADILLAC - DeVille convertible, all power, ac, steel belted tires, new trans & brakes. Tom, 289-8323 after 6.

TIRE - 650-13, good for spare. \$3. Susan, Ext. 3609.

66 VW BUG - New Engine, transmission slips out of high. \$400. C. Nielson, Ext. 3935.

USED TIRES - (3) 685-15" & (4) 650-13". 475-0144 after 6.

67 PONTIAC TEMPEST - V8 auto, hi miles, but runs great, make offer. Asking \$325. Ext. 2032.

72 BLAZER - 4 wheel drive, auto, ps/pb, new duals, rims, tires, excel cond. \$3100. Bill, 281-6365.

72 YAMAHA - 175 cc street & trail, very good cond, under 2000 mi. \$500. Frank, Ext. 4095.

65 PLYMOUTH WAGON - 318 auto, 4 dr, good transportation. \$400. Kenny, Ext. 4003.

MOTORCYCLE - Honda 350, 1972 excel cond, custom, handle bars, sissy bars, crash bars, highway horn. \$625. Ext. 3323, 751-7140.

73 TRIUMPH - Daytona 500 cc, low mi, 1900 mi, like new. \$1100. Jack, 286-0345.

Boats & Marine Supplies

GAS TANK & LINE - Mercury 3 gal, 1969. J. Olson, Ext. 3382, 289-8629.

24' CATBOAT - Marie, classic gaff rig needs saving. \$1500 for a labor of love. Max Small 286-8886.

18' PEMBO BOAT - 75 hp Evinrude, needs work, best offer over \$200. 751-8918 after 5.

24' ZOBEL - Hard top sea skiff, 125 hp Chrysler crown, large cockpit, excel bass boat, good cond. \$1000 or best offer. 363-6037.

17' TIGERCAT - Fiberglass catamaran w/trailer, ready to sail. \$600. John Evans 286-2297 eves.

21' GRADY - White Atlantic skiff, 1964, wood hull, vinyl decks, no leaks, depth finder, outrigger, 175 hp V8, like new. \$2000. 734-7342 after 6.

21' MAKO FLEETWING - Fishing skiff, 115 Merc power lift, df, center console, 2 fishing seats, galvanized tandem trailer. Ext. 3120, 286-0626.

16' FIBERGLASS RUNABOUT - Center console, self-bailing deck, 85 hp Johnson electric, oily trailer, \$950. Otto Medeck, Ext. 2350, 363-6439.

BENDIX NAVIGATOR 420 - 8 transistor, 3 band, portable director finder. 286-0206.

34' BALTZER - Twin 125 hp Chrysler engines, camper back, excel fishing or family boat. 331-1718.

31' CHRIS CRAFT - Express cruiser, 125 Chrysler crown engine, very good mechanical cond, many extras. \$850. 475-8201 days, 289-5607 eves.

18' LYMAN ISLANDER - Inboard. \$300. Marie, Ext. 3857.

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GE AIR CONDITIONER - Portable, A-1 cond. \$75. Leo, Ext. 3498.

BOY'S BIKE - 26" single spd, \$25. Mike 475-5543, John, Ext. 4214.

TV ANTENNA - New color UHF-VHF, 50 element, orig \$39, sell \$18. Tom, Ext. 3703.

STROLLER - Good quality European model in excel cond, \$30; sears elec alarm clock, \$4. Pynn, Ext. 3927.

POOL TABLE - W/balls & cue sticks, 39"x72". \$25. Ext. 4249.

GUITAR AMP - "Kay," 50 watts, all trans, 12" speaker, reverb, excel cond. Asking \$100. 585-8322.

BABY ITEMS - Crib, playpen, stroller, carriage, others, 734-7342.

LAYTON CAMPER - Sleeps 7, heat, hot water, oven/stove, refig, toilet, shower, self-contained. 588-0147.

WOMEN'S BICYCLE - New, \$55; insulated glass w/ frame, 3'10"x3'10", \$50; royal standard typewriter, \$45. Ext. 3148, 325-1961.

COUCH - Black vinyl, 2 bolsters, excellent. 289-3114.

COCPAPOO PUPPY - 3 months, black female, wormed w/all shots, \$55; also free kitten. March Barnett 281-5296.

TRAILER HITCH - Fits '71 Ford Pinto, \$10; lawn mower, will start, needs work, \$10. March Barnett 281-5296.

PIPE - ¾" galvanized, new, \$25; uniflow deep well head, \$20. Ex. 4761, 924-3556 eves.

TELEPHOTO LENS - Sears 200mm for 35mm camera w/Pentax mount, \$75. Mac 928-9078.

COCKTAIL RING - Custom made, 1.75 carats total weight, 1 carat Marquis cut diamond surrounded by (24) 3 pt chips. \$1000. 363-6223 after 5.

TURNTABLE - Garrard S195B w/base, dust cover & Stanton 500E cartridge, \$45. Frank Paige, Ext. 3836.

PACHYSANDRA - Good ground cover. 50 plants for \$5. 744-5448.

DOUBLE BED - W/mattress; twin bed; rug; table lamps, good cond. 473-0649 eves.

KEROSINE STOVE - 3 burner table model, may need wicks. \$10. 727-1329.

3 ALBUMS - Egyptian, some Pakastani records, 78 rpm, instrumentals & vocals. \$10. Al Campbell, Ext. 3554.

REFRIGERATOR - 2 door, 14 cu ft, old but in working cond, make offer. Tom, Ext. 4102, 744-5801.

CLOTHES WASHER - Portable; refrigerator; wood cabinets; imitation fireplace; freezer; many other items. 286-1951.

CAR STEREO - Audiovox, 8-track w/pair speakers, like new. 589-1069.

ENGLISH POINTER - 2 yrs old, good hunter, \$50. Ext. 2876, 878-1895.

GERMAN POINTER - Short haired, 8 months old, house broken, good disposition, \$50. Ext. 2876, 878-1895.

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

½ ACRE LAND - 70' mobile home, all utilities, low taxes; route 13, Delaware, Ext. 3148, 325-1961.

GLEN COVE - 2 story colonial, private beach. \$80,000 firm. 676-8396.

RIVERHEAD - Mobile home, 2 bedrm, full appliances, large private year, 3-car driveway, family park, many extras, 369-2139.

BELLPORT - E. Patchogue, impressive center hall col, 24' livingroom, dining, 4 double bedrms, 2½ baths, family room w/fireplace, basement, 2-car garage, heavily wooded ¾ acre, beach rights, reduced \$53,900. 286-3944.

BROOKHAVEN HAMLET - Custom colonial, 4 bedrm, 2½ baths, fireplace in large living room, formal dining, large kitchen, den, many extras. \$51,500. 286-0158.

BLUE POINT - 4 bedrm, 2 baths, custom ranch, corner lot in quiet area, central air, finished basement, patio, play room w/14' fireplace, block to beach & school. \$52,000. 363-6375.

For Rent

HOUSE TO SHARE - 7 miles to Lab. Jack, Ext. 4255, 289-6708.

Classified Ad Policy

Deadline is 12 noon Monday for publication Friday of the same week.

- The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
- All items for sale or rent must be the advertiser's property.
- Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
- Firearms offered for sale or trade may not be brought on site.
- Ads not carried because of space restrictions will be held for publication in the next issue.
- Ads are run only once and must be resubmitted if they are to be repeated.
- Ads should be restricted to 20 words or less and typed or printed on the form provided, and must bear the employees signature.

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| <input type="checkbox"/> For Sale: Auto & Auto Supplies | <input type="checkbox"/> Wanted | Check <input type="checkbox"/> the heading applying to your ad. Print or type your ad in 20 words or less. |
| <input type="checkbox"/> For Sale: Boats & Marine Supplies | <input type="checkbox"/> Carpools | |
| <input type="checkbox"/> For Sale: Miscellaneous | <input type="checkbox"/> Lost & Found | |
| | <input type="checkbox"/> Services | |

Ads concerning property for sale or rent cannot be accepted on this form. Special Real Estate Ad forms are available at the Office of the Brookhaven Bulletin, Room 111, 40 Brookhaven Avenue.

Employee's Signature..... Life No..... Ext.....

Send to: Brookhaven Bulletin, Building 460, 40 Brookhaven Avenue (Ext. 2345).

(Name & Phone No. To Call)