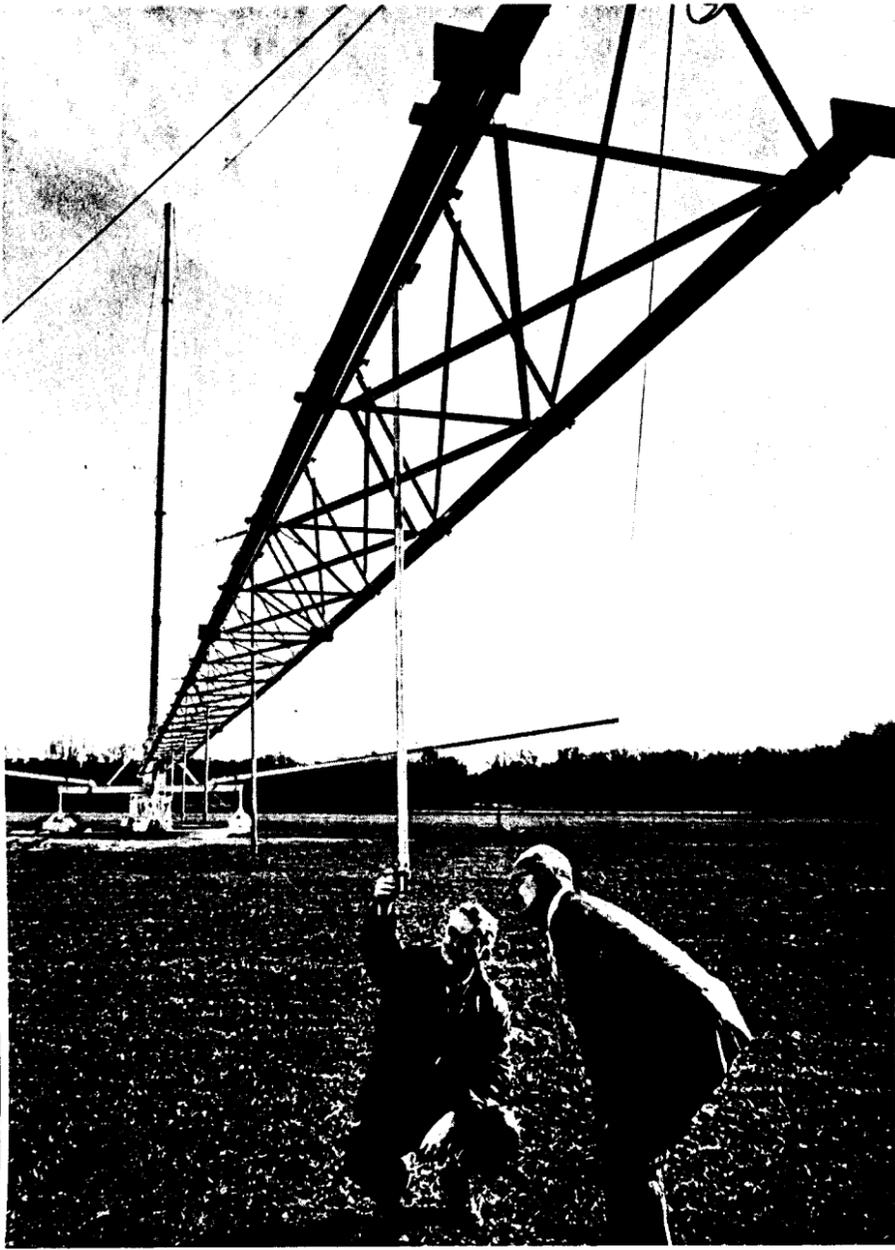
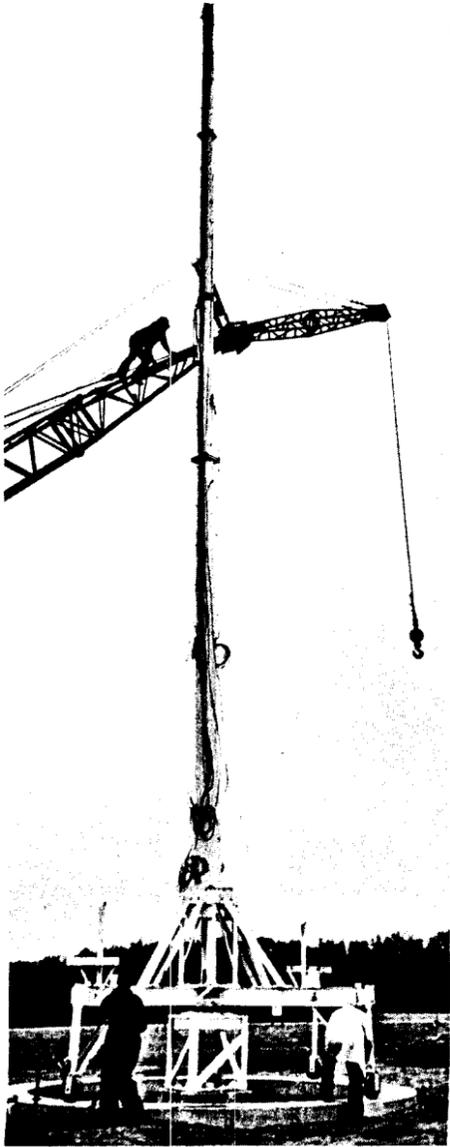




Let Us Spray . . .



The Upland Recharge Project at Brookhaven National Laboratory leans heavily on spray irrigation techniques for getting liquid sewage effluents back into the water table in a purified form. One of the most spectacular pieces of equipment to be used in this project will be the massive sprinkler head that has been erected in a field in the western portion of BNL. Two arms each 120 feet long are suspended from a mast 75 feet high and are

driven by an electric motor. After the central mast was fastened in place, Ed Vaughn of Plant Engineering climbed up the boom of a crane to release the nylon sling that lifted the mast. When the arms were in place, Jack Hennessey and Ed Hunter, also of Plant Engineering inspected the spray heads. It is expected that the project will be in the operation stages in late spring or early summer.

Shirane Honored At APS Meeting

Dr. Gen Shirane, a senior physicist at Brookhaven National Laboratory, is this year's winner of the Oliver E. Buckley Solid State Physics Award. The Buckley prize is given annually to the person who, within the five years immediately preceding the award, is adjudged by a committee of his peers to have made a most important contribution to the advancement of knowledge in solid state physics. Shirane's citation reads, "For his broad contributions to the understanding of structural phase transitions by means of inelastic neutron scattering." He performed his research at the High Flux Beam Reactor at Brookhaven National Laboratory.

Nearly 2000 physicists will gather in San Diego on March 19 through March 22 to hear approximately 1200 scientific papers in four major areas of research.

Dr. Joseph E. Mayer, Professor of Chemical Physics at the University of California, San Diego, President of the Society, will present the awards. In addition to the award to Dr. Shirane, two other major awards will be presented. The 1973 American Physical Society High-Polymer Physics Prize, sponsored by the Ford Motor Company, will be given to Mr. Frank J. Padden, Jr., and Dr. H. Douglas Keith of Bell Laboratories; and the Irving Langmuir Prize, donated by the General Electric Foundation, will be awarded to Dr. Peter M. Rentzepis of Bell Laboratories.

The four Divisions' Program Chairmen, who organized the program for the meeting, are BNL Director George Vineyard, Solid State Physics; H.S. Gutowsky, Chemical Physics; J.L. Koenig, High-Polymer Physics; and Franklin Hutchinson, Biological Physics.

Shirane will present his award address, "Phase Transitions and Neutron Scattering," on Wednesday afternoon, March 21. The award itself will be presented to Shirane at the Society's banquet on Tuesday evening.

The Oliver E. Buckley Award, established in 1952 by the Bell Laboratories, is administered by the American Physical Society and consists of a citation and \$2,000.

Antimatter Reveals Defects In Metals

How far is it from solid state physics to better quality metals used in industry? Apparently the two are more closely related than one might imagine.

Metals fail to behave properly because of defects, but not enough is really known about the relationship between the birth of a defect and its later effect on the behavior of the metal. Modern detection techniques can spot what are considered small defects, but now, however, physicists have developed a way to spot and study defects so tiny they would normally be known only to neighboring atoms within the atomic lattice of the metal. To do this, scientists at Brookhaven National Laboratory are using the annihilation properties of antimatter, first discovered in 1932. The particle used is commonly called the positron, because it acts like a positively charged electron.

A report on the method was given at the 1973 March Meeting of the American Physical Society in San Diego. The paper was authored by Dr. Allen N. Goland of BNL, Dr. C. Lewis Snead, Jr. of the American Institute of Physics, and State University of New York at Stony Brook graduate

student Thomas M. Hall. Dr. Snead will present the paper on Tuesday afternoon, March 20.

The metal they studied was aluminum that had been irradiated with the nuclei of helium atoms (alpha particles), by Dr. F.W. Wiffen at Oak Ridge National Laboratory. The positrons they used came from the radioisotope sodium-22. When the positron enters the aluminum, it loses energy, and is attracted to an electron, after which the two particles annihilate each other. Because mass and energy are equivalent, the annihilated positron and electron "reappear" in the form of energy, in this case, two gamma rays with about one-half million electron volts each.

The secret of being able to learn the where and how of a defect lies in the fact that a defective area has fewer electrons, therefore the annihilation process takes a little longer. The "normal" time of annihilation is less than a few ten-billionths of a second. A longer annihilation time is in the order of perhaps one or two extra ten-billionths of a second. The BNL scientists are measuring these time differences as well as the ratio of short to long lived positrons.

The initial experiment was devoted to the effects of helium in aluminum and what happens as the aluminum is heated. The helium apparently migrates to form bubbles which grow larger in size but fewer in number as the temperature rises. The Brookhaven research is important to the further development of metals for use in liquid metal fast breeder reactors and controlled thermonuclear reactors. Both of these reactors have large amounts of fast neutrons present, which causes helium to form in the reactor fabrication metals. The physicists are certain that the positron can be a useful tool in gaining a better understanding of the physics of defects in many kinds of solids.

Young Boatman's Course

Youngsters in the Three Village, Port Jefferson, Centereach and Miller Place area who are between the ages of 10 and 15 inclusive and are interested in taking the free four-session N.Y.S. Young Boatman's Course, may do so beginning at the end of March.

The four sessions will be conducted on Friday evenings from 7 to 9 p.m. in the Port Jefferson Village Hall, which is across the street from the Marina in Port Jefferson. The class is sponsored in the forementioned area by the Old Field Point Power Squadron with the cooperation of the Village of Port Jefferson. The dates are March 30, April 6, 13, and 20.

N.Y. State law requires any youngster between the ages of 10 and 15 to pass the Young Boatman's Course in order to operate a motor boat in New York. A "Safety Certificate" will be issued to all youngsters who successfully complete the course and pass the examination at the end of it.

There is absolutely no charge for the course and the student textbooks are provided free to the students by the N.Y. State Motorboat Division.

Added Attraction - Scotch Doubles Tournament

Morty Gunty, comedy star of night clubs and TV, will be at the Port Jeff Bowl on April 14 to entertain us on Scotch Doubles night. Morty Gunty has appeared on the Johnny Carson show and has played clubs in Las Vegas and Puerto Rico. So come on out for the tournament and enjoy bowling, a fine buffet, and dancing, and a "really big show" starring Morty Gunty.

Applications for the Scotch Doubles Tournament can be picked up at the BERA Sales and Services Office in the cafeteria.



Shirane was born in 1924 in Nishinomiya, Japan, and received his B.Eng. degree in 1944 and D.Sc. degree in 1947 from the University of Tokyo. He remained at the U. of Tokyo as a Research Assistant until 1948, when he became a Research Associate at the Tokyo Institute of Technology. In March of 1952, he was appointed Research Associate at Pennsylvania State University, where he remained except for a short period in Tokyo, until 1956. At that time he received an appointment as Visiting Associate Physicist at Brookhaven National Laboratory. In 1957 he joined Westinghouse Electric Corporation, and returned to Brookhaven in 1963. In 1968 he was appointed a Senior Physicist.

Shirane is a Fellow of the American Physical Society and a member of the Physical Society of Japan. He and his family reside in Bellport, N.Y.

World Of BNL

The coming week's schedule for the Laboratory's own radio program, the World of BNL, with host Norb Dernbach, is as follows:

Sunday, March 18

Health Physics

& Environmental Monitoring

Charles Meinhold & Andrew Hull

at 8:00 a.m.

WRCM-FM (103.9), Riverhead

WHRF-AM (1570), Riverhead

at 11:00 p.m.

WGLI-AM (1290), Babylon

Bowling News

Grace Fales

Green League

It's been a good season so far, but not as good as the next 6 weeks should be watching the Bubble Boys (40-23) and the Sandbaggers (39-24) battle it out for first place. The Bubble Boys took over first place this week with the help of R. Barberich's 225, W. Kollmer's 232, and S. Kiss' 203. Congratulations to W. Sells with a 203/686 gross series, the 28th Club Award given this year in the Green League. How about going for 30, (at least), fellas?

Pink League

Lynn Kalbach 170, Betty Jellet 171, and Marge Stoeckel 188/495 were the only ones to come through with some decent scores this week. Almost everyone else seemed to be struggling. The Pinspitters are holding their own in first by five points, and the Alley Oops have moved into second, dropping the Spares and Fiscal Assets to third and fourth respectively. The Hopefuls, Medi-Tarsals, and Bioboosers are all tied, separated only by total wood. The PIU's were lazy this week and missed their chance to "hang in there". Honorable mention to Fran Green (Medi-Tarsals).

Black and Blue League

2/28 - Highs for the night: Bill Lebitski 223/573, Lou Totans 204/553, Helen Caisey 176. What daughter bowled a higher game scratch than her father?

3/7 - Highs for the night: Kit D'Ambrosio 191/476, Jane Fisher 179, Helen Caisey 174, Ginny Muller 171. Ginny Diebel converted the 6-7-10 split and Helen Caisey converted the 4-6-10 split. It's really nice to see the girls picking up and striking a blow for women's lib.

Basketball Action

Last Thursday night ended regular season play for the BNL Basketball League. The Stealers clinched the second half title in their division by trouncing Physics 43 to 24. Larry Johnson tuned up for the playoffs by scoring the nets for 17 points as he and Bob Barone, who chipped in with a respectable 14 points, held the Stealers together. Stillman and Dick Sutter combined for 16 points for Physics.

In the second game AMD stayed sharp by downing the Circuits 43 to 18. Gary Larsen, Al Smith and ageless Bob Schuman did most of the scoring for AMD. Stubblefield led the Circuits with 10 points.

In the other League, the League champs, Tandem, completed its undefeated season by posting an impressive triumph over Medical 54 to 26. Jim Garrison, Leroy James and Burleigh James totaled 50 points among them. Congratulations Tandem.

In the last game of the regular season the Knacks downed Biology 32 to 28 in a close contest. Bob Casey led the Knacks with 10 points. Tom Jesaitis scored 10 for Biology.

On Thursday, March 22, at 5:30 p.m. AMD will meet the Stealers in a championship game. Everyone is invited. There will also be an All-Star game following the championship game.

Cafeteria Menu

Week Ending March 23, 1973

Monday, March 19

Tomato Soup	
Spanish Omelet & 1 Veg.	.85
Baked Macaroni au Gratin	
w/Bacon Strips & 1 Veg.	.90
Boiled Beef w/Beet Relish & 1 Veg.	.99

Tuesday, March 20

Vegetable Soup	
Manicotti w/Meat Sauce	
& Tossed Salad	.95
Sliced London Broil & 1 Veg.	.99
Pork Chow Mein on Rice	
w/Crisp Noodles	.95

Wednesday, March 21

Turkey Noodle Soup	
Corned Beef & Cabbage	
w/Boiled Potato	1.05
Spaghetti w/Italian Sausage & Peppers	.95
Grilled Chopped Beefsteak & 1 Veg.	.90

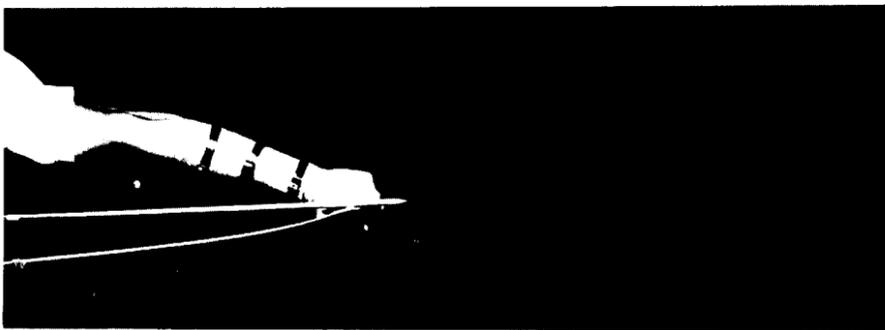
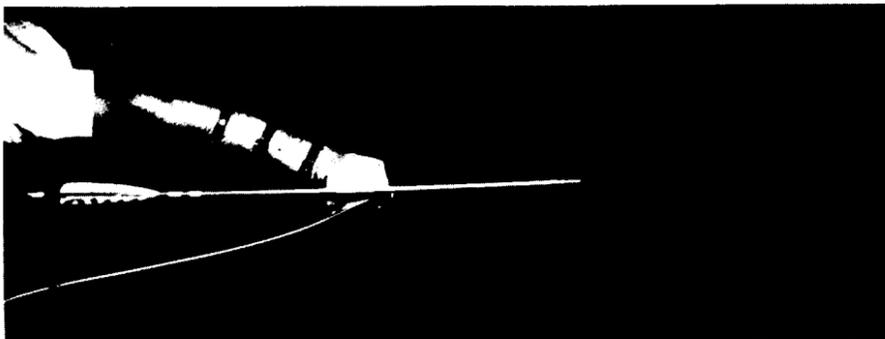
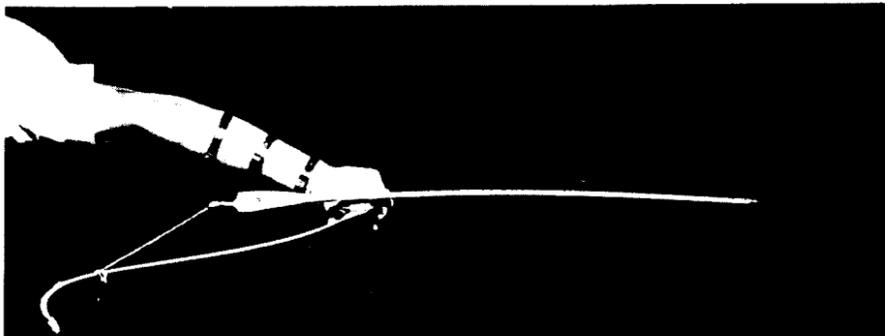
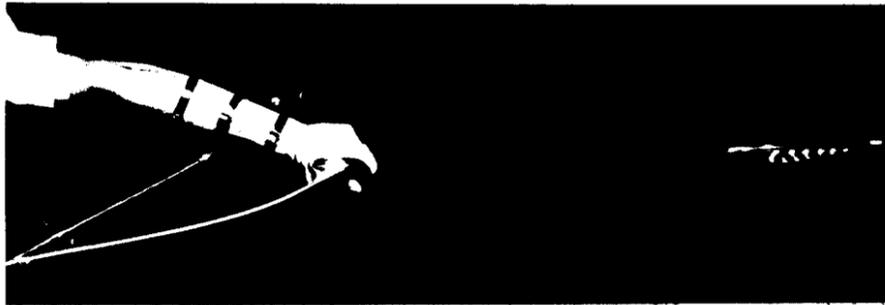
Thursday, March 22

Onion Soup w/CROUTONS	
Veal Parmigiana w/1 Veg.	.95
Braised Chicken Leg & 1 Veg.	.90
Baked Stuffed Green Peppers & 1 Veg.	.99

Friday, March 23

Manhattan Clam Chowder	
Roast Beef w/Brown Gravy & 1 Veg.	1.05
Fish 'n' Chips w/Tartar Sauce	.95
Half Sea Trout & 1 Veg.	.99

Straight As An Arrow?



At one ten-thousandth of a second, the flight of an arrow seems to be somewhat less than straight. Bob Walton of Photography made this series of pictures a few years ago in answer to a question from one of his children. Walton used a modified speedlight with a trigger mechanism hooked up to the bow. The bottom picture was taken just before the arrow was released. The next two pictures show the undulation of the arrow as it clears the bow, and the top picture shows the arrow clear of the bow and on its way to the target.

BERA Concert Series



The next concert will be presented by the Richards Quintet on Tuesday, March 27, at 8:30 p.m. in Berkner Hall.

The Richards Quintet was organized in 1948 as the Michigan State College Faculty Woodwind Ensemble. The group adopted the name of Richards in memory of Lewis Richards, the first head of the Music Department at Michigan State.

Recognized by critics and public alike as one of the finest wind chamber ensembles in the United States, the Richards Quintet is now broadening its horizons by concertizing internationally. The Quintet consists of Alexander Murray, formerly principal flutist of the London Symphony; Daniel Stolper, oboe, who has played as first desk man with the San Antonio and New Orleans Symphony Orchestras; Elsa Ludewig, well known clarinet recitalist and Marlboro Festival participant; Douglas Campbell,

French horn, former member of the National Symphony; and Edgar Kirk, bassoon, for many years visiting Professor of Bassoon at the Eastman School Summer Sessions.

"The performance by the Richards Quintet was unusually meticulous with a keen sense of intonation and above all, solid musicianship. The lyrical union was performed with unanimity rarely achieved. The inherent beauty of the music was enriched especially by the close attention given to dynamic contrasts." - Superior Press, Superior, Wisconsin, January 28, 1968.

For its BNL appearance the Richards Quintet has chosen a program of both classical and contemporary music, including works by Beethoven, Milhaud, Irving Fine and others.

Admission is \$4.00 for adults; \$2.00 for students under 25 and senior citizens over 65; and those under 18 will be free.

Stony Brook Events

Activities at the State University of New York at Stony Brook scheduled for the coming week include the University Lecture Series, films and several concerts.

Friday March 16

COCA will show the film "The Trojan Women" at 7 p.m., 9:30 p.m. and midnight in Room 100 of the Lecture Center; a limited number of tickets will be available at the door for \$1.

The Wesbeth Playwrights Feminist Collective is presenting "A Workshop in Progress of Plays About Women" at 8:30 p.m. in the Stony Brook Union Theatre; admission for the general public is \$1.

Saturday, March 17

The University's Spring Artist Series will present a concert with Soprano Jan deGaetani and Pianist Gilbert Kalish at 8:30 p.m. in Room 105 of the Lecture Center; admission is \$1.50. Works by Berg, Webern and Ives will be performed.

COCA will show Dennis Hopper's film "The Last Movie" at 7 p.m., 9:30 p.m. and midnight in Room 100 of the Lecture Center. A limited number of tickets will be available at the door for \$1.

Sunday, March 18

COCA will show the film "The Stranger" at 8 p.m. in Room 100 of the Lecture Center; admission is 50 cents.

Flutist Bruce Erskine, a University student, will present a recital at 8 p.m. in Room 105 of the Lecture Center.

Two films on mental illness - "Psychiatry and Violence" and R.D. Laing's feature documentary "Asylum" - will be shown on Sunday and Monday at 6:30 p.m. and 9 p.m. in the Stony Brook Union Auditorium. Tickets are \$2 at the door.

Monday, March 19

Under the direction of Prof. Paul Zukofsky, the University's Chamber Orchestra will present a concert at 8:30 p.m. in Lecture Center Room 105.

Tuesday, March 20

Tuesday Flicks will show two films by French Director Alain Resnais beginning at 8 p.m. in the Stony Brook Union Theatre. "Hiroshima Mon Amour" is the tale of two people trapped by memories of the war. Yves Montand plays a Spanish exile planning to overthrow the Franco Regime in "La Guerre Est Finie."

Thursday, March 22

The Center for Continuing Education will show Bunuel's film "Viridiana," a Grand Prize Winner at Cannes, in Room 100 of the Lecture Center at 8:30 p.m. The film satirizes society and religion.

Friday, March 23

Clarinetist Jack Kreiselman, one of the University's 14 Performing Artists-In-Residence, is featured soloist at a chamber concert beginning at 8:30 p.m. in Lecture Center Room 105; admission is \$1.50.

COCA will show the film "Carnal Knowledge" at 7 p.m., 9:30 p.m. and midnight in Lecture Center Room 100. A limited number of tickets will be available at the door for \$1.

The Student Activities Board will present an informal concert with Orleans at 7:30 p.m. in the Stony Brook Union Auditorium.

BERA

Sales and Services

The BERA ticket service located at the cafeteria, has the following tickets on sale for the month of March.

Special sale on the Islanders and Net tickets \$4.00 each.

Islanders:

Sat. the 17th.	St. Louis
Tues. the 20th.	California
Sat. the 24th.	Philadelphia
Tues. the 27th.	Buffalo

Nets:

Wed. the 21st.	Denver
Fri. the 23rd.	Kentucky
Sun. the 25th.	Indiana

Metropolitan Opera:

Tickets sell for \$2.85 and \$5.50. There are four \$5.50 seats available for the performance of Peter Grimes on Tues. March 20, and eight \$2.85 seats for Pique Dame on Tues. March 27. Tickets are also available for the month of April and you may purchase any quantity with no restrictions.

In addition, we have mail order forms for the Ice Follies at the Nassau Coliseum, (giving Brookhaven employees a discount of \$1.00 on each ticket) and exchange coupons for the Automobile Show at the New York Coliseum.

You may also pick up free Disney World discount coupons and your season swimming pool passes here.

In the future all BERA tickets will be sold at this office.

