



Nostalgia Rules The Day As Green Recalls AGS Startup



Ten years ago the AGS was brought into operation. For these men it was the culmination of a dream that started in 1952. On the Tenth Anniversary of "Beam Day" they gather to reminisce about the starting up of the 33 GeV Alternating Gradient Synchrotron. Seated: G. Kenneth Green. Standing, left to right: Julius Spiro, Ernest Courant, John Blewett, and Martin Plotkin.

—Humphrey

Ten years after "Beam Day" at the AGS on July 29, 1960, Dr. G. Kenneth Green, former Chairman of the Accelerator Department, recalls for the *CERN Courier*, the excitement of bringing the newly-constructed AGS up to design power.

At the time of the startup, Dr. Leland Haworth was Director of Brookhaven National Laboratory, Dr. G.F. Tape was Deputy Director, and Dr. Maurice Goldhaber was Chairman of the Physics Department. Lloyd Berkner was President of AUI, and John S. Graham was Acting Chairman of the Atomic Energy Commission. Dr. Green's story follows.

A particle accelerator comes alive with its first beam. While it can accelerate beams it seems animate -- at least it seems so to its builders and nourishers. When it is turned off during a long shutdown it seems only a collection of parts. When it is turned off for the last time it expires, and a little something in its builders expires, too. Such are the reasons that "beam day" is so important to accelerator builders. Let no one imagine that the builders of an accelerator have any doubts that it will "work." If they had any such doubts they would never have begun their long and exacting task. "Beam day" is the day on which their creation comes alive. It has no relation to proving their ideas are good -- that will come later when the machine is put to use -- it has to do with the subtle difference between a loose collection of components and a functioning, complex, unified device.

Ten years ago the AGS was brought into operation.

The AGS really started in 1952. The Cosmotron had accelerated protons beyond 2 BeV (they were not yet GeV) and, although the machine was still too rickety to do real high energy research, it was quite clear that the proton synchrotron could be extended to any size desired. CERN was being established to build on the next larger scale (we did not yet know that the Russians were embarking on the Synchrophasotron) and it seemed quite straightforward to extrapolate the technique. That is, it seemed straightforward until one looked critically at the unfortunate technical and financial problems. Then Courant, Livingston and Snyder hit on alternating-gradient focussing and realized that they had really struck something. Soon vast rings were building in the air, and John Blewett's strong focussing linac would be a practical injector. I was away on a month's vacation and missed the beginning of the fun and excitement, but returned in time to join in the design of quadrupole lenses and the beginnings of beam transport.

Haworth Letter

Leland Haworth wrote the AEC to the effect that it would be good to build a large alternating-gradient proton synchrotron. The AEC replied that it would indeed be good -- why didn't we do so? (In this time of telephone-book size proposals Haworth's five page letter is a prized classic.) During the first enthusiasm, a quick survey of an ideal AG synchrotron made everything seem easy. A closer examination of the

"Over the past ten years, the AGS has made many discoveries of new particles, confirmed some theories and disproved others, and most important, extended man's knowledge about the secrets of the atom well beyond the limits dreamed of by even the most visionary of the scientists who supported the AGS concept."

MAURICE GOLDHABER
Director, BNL



"Tattered Ring Data Book I describes the slow and painful process."

properties of a real, imperfect synchrotron began to uncover hazards which must be avoided. First came the problems of the resonances, then the ghastly precision needed to obtain a tractable central orbit, the question whether impossibly small nonlinearities in the magnetic fields would destroy the stability, the realization that the radio frequency generation methods of the "older" synchrotrons could not possibly accelerate protons in an AG synchrotron, the fearful complexity of strong-focussing linac design. We built the Electron Analog to test the orbit theory, and to gain experience in alternating gradient design. This little electrostatic synchrotron was something accelerator people talk about, but

(Continued on page 2)

Chairman Fred Mills Recaps Ten-Year Impact Of AGS

"The operation of the AGS ten years ago was the culmination of a decade of effort. The first round of the new accelerators -- the Model-T accelerators, to quote Hartland Snyder -- were operational. The ease with which the twins, the Alternating Gradient Synchrotron and the CERN Proton Synchrotron, had gone on line stunned us all, and caught us short in our ability to exploit them.

The decade began with the invention of the alternating gradient focussing concept here at BNL. This idea caught quickly in the minds of scientists, then spread and proliferated into new ideas and concepts. Sector focussed cyclotrons, FFAGs, beam storage and stacking were ideas which evolved directly from the properties of AG orbits. Colliding beams, long a dream, now came into the realm of the possible. It became apparent that the AGS was the best route into the 100 to 1000 GeV region.

The past ten years have witnessed the further implementations of these ideas. The Serpukhov 70 GeV accelerator has been operational for several years. The CERN intersecting storage rings will begin operation in the near future as will the 200 to 500 GeV NAL accelerator. Electron-positron storage rings are in operation at many centers in Europe and the Soviet Union. In addition, our ability to exploit these machines is greatly enlarged through the development of instrumentation, most notably the spark chamber and the online computer system. The Slow External Pro-

ton Beam has proved to be essential for complete utilization of the AGS.

What the future holds is not easy to infer at this time since the accelerators themselves must grow out of the needs of high energy physics research. It is worth noting that it is presently within our grasp to produce collisions of protons at energies where weak interactions and strong interactions may be of comparable strength, a goal thought unattainable only ten years ago."



Fred E. Mills
Chairman, Accelerator Department

Milestones In The Construction Of The AGS

- Summer 1952 Concept of strong focusing principle.
- August 1953 Proposal made to the U.S. Atomic Energy Commission.
- January 1954 Authorization and funds allotted by Atomic Energy Commission.
- December 1955 Beam in electron analogue accelerated to 5 MeV.
- January 1956 Digging started for circular trench to house magnet tunnel.
- May 1959 First beam accelerated by Cockcroft-Walton generator.
- April 13, 1960 Linac proton beam accelerated to 50 MeV for first time.
- May 17, 1960 50 MeV proton beam injected into synchrotron and successfully completed one turn.
- May 26, 1960 Beam injected into synchrotron and successfully spiraled around ring approximately 100 times without r-f acceleration.
- July 22, 1960 First attempt of appreciable acceleration resulted in occasional pulses to phase transition at a few BeV.
- July 29, 1960 Beam consistently passed through phase transition and was accelerated to above 30 BeV.
- June 1963 80" Chamber in operation.
- February 1964 Omega-minus particle discovered.
- January 1966 AEC includes \$45.8 million in budget for AGS conversion.
- March 1968 Slow external beam in operation.
- November 1969 Seven foot Chamber in operation.



Control - Room July 29, 1960

"We had promised 10⁹ protons at 30 BeV for 31 millions of dollars, and we had spent at that point a little less than 29 millions. We were elated!"



Leland Haworth
 "... His five page letter to the AEC is a prized classic."

seldom build -- a device designed only to accelerate particles. It passed easily through phase transition with its "phase lock", and demonstrated that non-linearities could readily be controlled. Slowly the problems came into perspective and solutions were found. Buildings were completed and apparatus began to arrive in a torrent. A machine began to emerge out of the confused stacks of parts, and finally it was ready to try.

The Cockcroft-Walton preaccelerator was fittingly the first of three accelerators in cascade. In place of gas-pump glass cylinders there were commercial rectifiers (solid state!) and ceramic-metal assemblies but it was a direct descendent of its sturdy ancestor. It first had beam in May, 1959. There are immutable laws of physics that permit one to worsen the output of a synchrotron's preaccelerator, but never to better it. Many months of careful work were needed to bring the preaccelerator to the required level of performance.

Linac Ready

On April 13, 1960 the linac accelerated protons to 50 MeV. Its output immediately climbed to a few milliamperes. One major worry was out of the way! The workability and usefulness of the PS and AGS had been predicted on an injected linac current of at least a milliampere at 50 MeV, at a time when the record was 160 microamperes at 10 MeV. The linac group was in great good humor. When would the ring be ready for beam?

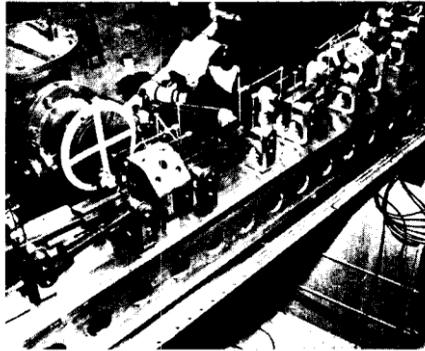


John Blewett
 "His strong focussing linac was the injector."

The ring still lacked some sectors of vacuum, the magnet power supply was being recalcitrant, no rf accelerating stations were connected, and essential controls were lacking. Finally, on May 17, the ring vacuum was continuous, the magnet could be pulsed, and basic controls were available in the linac control room. The first turn in a large synchrotron is an important matter. Inaccuracies and small imperfections can scarcely be seen in one turn, but mistakes will appear. No matter how much care is taken, and no matter how many cross-checks are applied, a mistake can creep in. And it can take a great deal of time to correct one.

We gathered in the linac control room after dinner on the 17th of May. The linac was

running rather well. Bill Link and Hugh Brown began their mumbo-jumbo of measuring emittance by observing the injection line flags and then setting the injection optics from their families of graphs. The current measurements were being made on a Type K potentiometer and so were rather slow. After awhile people began to be impatient and cries of "that's close enough" began to be heard. Nevertheless, they continued until they were satisfied. Beam was injected into the ring and observed on the flags at A7 and A13 in order to adjust the inflector voltage and the field markers. That some of these adjustments had to be made in the temporary control room, by



"We built the Electron Analog to test the orbit theory, and to gain experience in alternating gradient design."

instructions over the telephone, was not very helpful but finally injection was right and the spots were centered on A7 and A13. These flags were retracted and the television monitor was switched to C17, one-quarter way around the ring. There was the spot. Everyone had his eyes glued to the monitor. In quick succession the beam was found on F17, on I17 and then on L17, all the way around. It seemed a



Ernest Courant
 "With Livingston and Snyder he hit on alternating-gradient focussing."

little too easy, but there was a sense of relief. We had not made mistakes in the ring.

Beam Spirals

The following week, on the evening of May 26, we assembled to spiral the beam. The notes in the book show a series of settings of inflector voltage and timing to



Bob Alvino
 "During the morning of July 22, the system was adjusted to inject, capture, and change to phase lock."



Robert Dryden
 "Finally the ring vacuum was continuous, the magnet could be pulsed, and basic controls were available."

center the spot on A7 -- "could not see spot on A13 because of TV trouble". Since systematic injection setting was done with A7 and A13, the lack of A13 was a handicap, but "now saw spot on L7 at center". Finally "Inflector pulsed -- saw about 7 turns or 9". "Picture #1 -- see next page." Picture #1, stuck on the next page with now yellowed scotch tape, shows the scope trace that flickered before our horrified eyes. As the beam circulated it lost about half its intensity on each turn and disappeared completely in 7, or if one used his imagination, 9 turns. Something was badly wrong with the machine. Everything at hand was varied without observing any change in the loss of beam. Ernest Courant observed, rather mildly, that the loss was too regular, there must be something in the way. Suddenly Ralph Kassner grabbed a flashlight, said "Turn the beam off" and disappeared. Presently we were informed over the phone that the screen wire flag had been left in at L17. It had not been retracted before its power supply was removed for use at some other place. After a certain amount of confusion a storage battery was found and the motor ran the flag out. The various people were checked out



Ralph Kassner
 "... grabbed a flashlight and said 'Turn the beam off.'"

of the tunnel against the gatekeeper's list (security was simple then -- chains and padlocks and a gatekeeper at one gate in possession of the only key). We were tense while the beam was turned back on and settings were restored to what were thought to be the previous values. When the inflector was pulsed the beam calmly spiralled a hundred turns! There are several pictures in the book. The spiralling wasn't very good and a few adjustments were tried but the machine was obviously in order, needing only careful setting. It had been a long day, we were tired and relieved, we turned it off and went home.

Rf System Connected

Nearly two months went by without injection, while the rf system and control system were being connected. On July 15, a part of the accelerating system was in operation. Spiralling beam was set up and, in Hildred Blewett's hand, "The starting oscillator was turned on tentatively -- perhaps some capture observed. Shut down 4:45." Crews were working day and night. By July 17, five of the twelve power amplifiers were able to produce 6 kV of accelerating voltage each. Again spiralling beam was set up and beam was accelerated to about 2 milliseconds, the duration of the



G. Kenneth Green
 "Tension and frustration built up, and I recall with shame screaming in black rage."

not going is not known." A few of us were concentrating on the beam capture and phase lock with scopes set to sweep for only a few tens of milliseconds, but someone had connected another scope and set a longer sweep so that the occasional beam survival to the end of the magnet cycle could be seen. The control room was filled with people. Rumors spread all over the Laboratory. I was dragged away from the scopes to the telephone. There were brief sharp quarrels with some of my best friends.

Tension Builds Up

There was serious trouble with the accelerating system and it made no sense to try for energy until the system was under some control. In spite of that the control room became more and more crowded, cheers went up when the beam occasionally flashed to the end of the magnet cycle. The crowd became so dense that people began standing between us and the scopes (little



Martin Plotkin
 "Humor me, reverse the transition switch!"

correlation had then been achieved between the location of controls and the position of indicators). Tension and frustration built up and I recall with shame screaming in black rage. Finally some sanity returned and it became evident that a machine does not respond to screaming. We arranged for groups to visit the control room in more orderly fashion. At 6:15 the

starting oscillator signal. Three more rf stations were operating on July 20, so a part of the day was used to refine adjustments of injection and capture. "Capture was quite consistent on each pulse." On the following day the adjustments were repeated and, for the first time, the electronic switches were triggered to transfer the beam from the starting oscillator to the phase lock system. There were the usual troubles with the timing of the switches and with cutting cables to match the phases in the complicated system. The beam "went out to 6 to 7 milliseconds" and after some adjustment of switch timing and phase "beam went to about 16 to 17 milliseconds—but not consistently." "Shut down 4:45."

In order to control "beam fever" the electronic switches had been timed to turn off soon after injection. Then overnight the radio frequency group managed to make eleven of the twelve accelerating stations operate, and the excitement was almost uncontrollable. During the morning of July 22, the system was adjusted to inject, capture, and change to phase lock but the power room was ordered to pulse the magnet for only 1/4 second. The notes read "After radial control turned on most beam lost after 40 milliseconds. Occasional pulse went 230-250 msec (transition?) approx. 6-7 BeV!! Reason for beam going or



Rod Di Girolamo
 "Security was simple then - chains and padlocks and a gatekeeper at one gate in possession of the only keys."



Courant - Haworth - Plotkin
 "About 4 p.m. when beam was going through transition - magnet cycle was changed to 65 cycles. Corresponds to 5800 amp. This corresponds to 31 BeV."

rf was stopped. The rf system had only been connected and there had been no time to make proper electrical measurements on it. The coaxial signal cables were not connected so there was no monitoring of the accelerating cavity voltages. Nevertheless, we decided, after much argument, to try to accelerate beam on Monday, just for luck.

It was no use. After struggling all day on July 25, Blewett, Haworth and I had the accelerating stations turned off one at a

were quickly found. Most of the stations had "holes" at some frequency and the phase tracking was at (or probably beyond) the limit of the control phase shifter. For three days the rf group plodded around a half mile of concrete ring with their instruments. Thursday evening the system was operating properly and the critical electrical measurements indicated that the system was within its control range. We agreed, "tomorrow it will work".

Success At Last

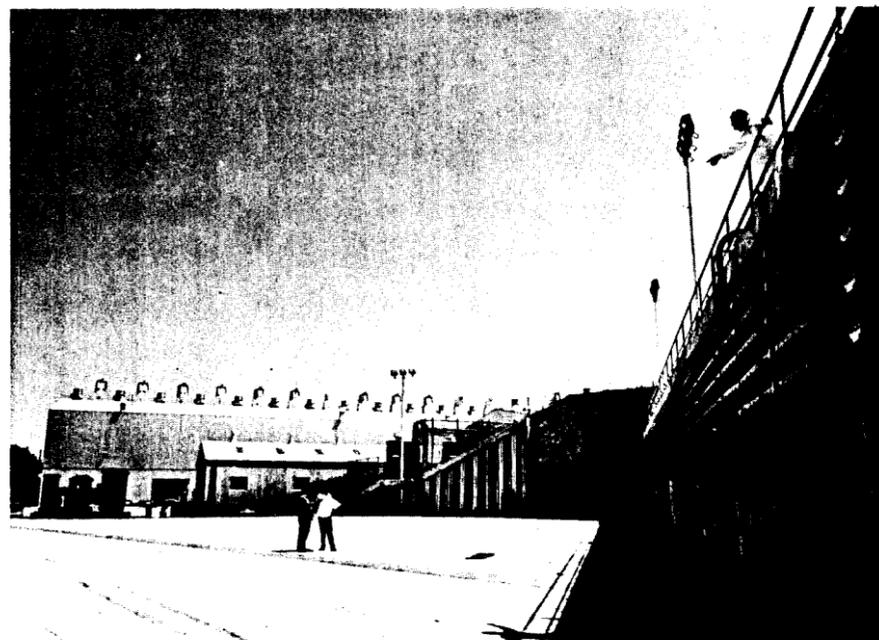
And on Friday, July 29, it did work. There was steady progress with adjustments until a beam was being accelerated to phase transition, but there it stopped. After careful observation and erudite discussion we concluded that the transition switches were correct, but Marty Plotkin had some doubts. He said, "Humor me, reverse the transition switch." It was reversed and the beam went out to 24 BeV. The book reads "About 4 p.m. when beam was going through transition to end of magnet cycle to 850 msec fairly well magnet cycle was changed to 65 cycles. Corresponds to 5800 amp. This corresponds to 31 BeV. Beam went out to about 1.1 sec without loss of intensity!" Under the photo of the "mouse" it reads - "Note added 8/2/60 - Estimate from picture # 11 (according to H. Halama about 8×10^9 protons." We had promised 10^9 protons at 30 BeV for 31 millions of dollars, and we had spent at that point a little less than 29 millions. We were elated.

Tattered Ring Data Book I describes the slow and painful process of gaining understanding of the AGS. Target studies began to appear in October 1960. On November 1, an unknown hand proudly states "Beam spiralling in ring and accelerated to the end of magnet cycle after 5 pulses." The first H.E. Physics run is noted on November 10, and on December 21, Ernest Courant and Julius Spiro were setting up the target for experiments.



Julius Spiro
 "Before the end of the year, Courant and Spiro were setting up for experiments."

time. The control time delays, designed to protect expensive tubes, made the job last more than an hour. Only one station made any difference when it was turned off. We stopped the machine at 8 p.m. and told the rf group "back to the scope and signal generator". Next morning the ring was turned over to the rf effort and the troubles



After the first run the 7-foot bubble chamber is to be moved to the new North area where it can be supplied neutrinos and other particles by the fast extracted beam from H-10.



BROOKHAVEN BULLETIN

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Volume 24, Number 29

July 30, 1970

S U P P L E M E N T

Softball

by Jack Brennan

Brookhaven League (one game only reported)

Old Timers 12	Blue Jays 10
Won	Lost
Dirty Sox	4 0
Old Timers	2 1
AMD	2 3
Blue Jays	1 2
S&M	0 3

Brookhaven League Captains, to keep their records up to date, should get in touch with League Representative Walt Chornoma after games or Ext. 2382 or Jack Brennan on Ext. 2814 to report games.

National League

Metallurgy 14	Phoubars 9
Bubble Boys 28	Rat Pack 8
(P. St. Iman two homeruns)	
Pop-Ups 12	Deadwoods 9

	Won	Lost
Metallurgy	5	0
Pop-Ups	4	1
Bubble Boys	2	3
Deadwoods	2	3
Phoubars	2	3
Rat Pack	0	5

Laboratory League

No scores have been received.

Softball Night

The Softball Committee has selected the evening of August 25 for the annual softball night. Rain date will be August 26. All softball players and their family members will be given tickets which must be shown to the booth attendants for all refreshments received during the evening.

The softball game will be played between the Brookhaven, National, Laboratory, and Mixed Leagues.

This year's event has promises of being bigger and better than ever. Make it a point to make your plans now to be at the ball fields on Tuesday, August 25.

Tennis News

The tennis committee is pleased to note the active use of the tennis courts by the entire BNL community. Players are reminded that there are a limited number of courts, and when all courts are in use and players are waiting on the sidelines, every effort should be made to limit waiting time either by offering to play doubles or by limiting singles play to one set, unless the match is part of the tournament competition.

Since the majority of employees have limitations on their time for tennis, family members are requested to try to play tennis at times other than the noon hour and immediately after five. The cooperation of all concerned will be appreciated.

The posted results for the 1970 BERA Tennis Tournament, as of Tuesday, July 28, are:

Men's Singles

2nd Round: Elmore-Thomas, 6-0, 6-1; Kevey-Bailey, 6-3, 7-5; Rademacher-Goosman, 6-3, 6-4; Brandon-MacKenzie, 6-1, 6-0.

Four more matches are needed to complete the 2nd round. Contestants are urged to schedule their matches early in the week to allow for rescheduling in the event of inclement weather.

The Walter W. Merkel Men's Doubles

First Round: Palmedo, Ascoli-Webb, Handschub, 6-1, 6-1; Brandon, Garelick-Kusmiss, Gross, 6-1, 6-1; Als-Nielsen, Passell-Koetzle, Thomas, 6-3, 6-2.

This completes the first round.

Mixed Doubles

First Round: Stangby, Palmedo-Koetzle, Koetzle, 6-1, 6-2; Connell, Ascoli-Engelbertank, Olness, 6-1, 6-2.

Two more matches are needed to complete the first round.

Ladies' Singles

First Round: Dorning-Gross, 6-0, 6-4; Block-Abata, 6-1, 3-6, 6-3; Thomas-Gahn, 6-4, 6-0.

One additional match is needed to complete the first round.

Six American Craftsmen To Show Art At BNL

The next BERA Art Exhibition will be devoted to the works of six prominent American craftsmen. The show, which will be entitled *The Fine Crafts* will be the first in the BNL series devoted exclusively to crafts, and will include ceramics, weaving, fabric design and jewelry making. The works to be shown were selected on the basis of representing in depth the oeuvre of a few selected artists and at the same time representing some of the great technical and artistic variety that characterize American crafts today.

More details of the exhibition will be given in the *Bulletin* next week, but members of the Brookhaven Community and their friends are urged to save the evening of August 10 for the show's gala opening. The show will remain at Brookhaven through August 24.

NY Jets Ticket Reservations

The Recreation Office door will open at 9:00 Monday morning, August 3, to take ticket orders for the 1970 Jet season games at Shea Stadium.

The BERA seats are located in Reserve Section No. 23, and are priced at \$6.50 each.

In an effort to make tickets available to as many interested employees as possible, the following sales procedures will be observed:

1. Tickets are intended for the employee and his immediate family. It is understood that a single employee might wish to purchase a ticket for his or her escort.
2. An employee is entitled to purchase two tickets for one game only.
3. Ticket reservations must be made in person. No telephone orders will be accepted.
4. Payment must be made at the time of order. Check payable to BERA, please.
5. Tickets will not be returnable or acceptable for refunds or exchange at the Recreation Office. Refunds or exchanges should be made at the Ticket Office at Shea Stadium.

Home Schedule

Saturday, October 10	Miami
Sunday, October 18	Baltimore
Sunday, October 25	Buffalo
Sunday, November 1	NY Giants
Sunday, November 22	Boston
Sunday, November 29	Minnesota
Sunday, December 6	Oakland

Movie Tonight

Thurs., July 30 - 8:30 p.m. - Berkner Hall

Hiroshima, Mon Amour

Alain Resnais produced and directed his first feature film, *Hiroshima, Mon Amour*, in 1959. In this early "new-wave" movie Resnais employed unusual cinematographic techniques, complex underlying themes, and excellent acting to achieve the desired moods of past and present, Hiroshima and France, and the seamlessness of the intertwining music, image, and language, in the story of a love affair between an impressionable French actress and a married Japanese architect. (In French with English subtitles)

Shorts: The Railrodder

A short, classical, Buster Keaton comedy complete with the Keaton sight gags of the silent film days, *The Railrodder*, produced in 1965 by the National Film Board of Canada, depicts Keaton in a trip across Canada on a motor-driven railroad hand car.

Micro

A short, interesting industrial film about the miniaturization of electrical circuits, with jazzy background music.

Next Week: *The Navigator*, with Buster Keaton. *Never Give A Sucker An Even Break*, W.C. Fields.

Soccer

K. Batchelor

On Saturday, July 25th, the BNL Soccer Team entertained Patchogue of the Long Island League in a friendly game in which the BNL team won an evenly contested game by three goals to two.

The first half saw BNL kicking downhill with the wind in their favor but in spite of numerous openings created by their lively forward line, they were unable to press their distinct territorial advantage to the point of goal scoring. A. Boyum came near to scoring a number of times in this half but at half-time neither team had scored.

At the start of the second half, a period of strong pressure from the Patchogue team ended in a short range goal scored by F. Patus while the BNL defense was appealing for hand-ball. Immediately upon resumption, the BNL forwards combined in a fine passing move which ended in a well-taken goal by R. Woods. Fifteen minutes later the Patchogue fullback, H. Theman, put his team in the lead again with a fine follow-up goal from a corner.

Once again BNL struck back quickly with an opportunist goal by A. Boyum. Five minutes before time, a rejuvenated BNL team went ahead when P. Hubbertsty lobbed the ball over the Patchogue goal-keepers head from long range. The BNL defense was able to resist all further scoring by Patchogue so BNL was able to chalk up their second consecutive victory on their home ground.

Last Monday evening in a practice game between AGS:DAS and Medical vs Physics:Chemistry and others, a keenly contested game ended up with a score of 7 to 5 in favor of AGS:DAS and Medical. There will be the usual practice game this coming Monday at 5:30 p.m. All comers including beginners are welcome.

Former Advisor In Vietnam To Speak

Dennis A. Smith, ex-Marine, former missionary, and now a candidate for Congress from Massachusetts, spent seventeen months in Vietnam as Refugee Director for the Agency for International Development and Chief Refugee Advisor to the Mayor of Saigon.

His experience and observation was not confined to an office desk. He made the headlines in 1967 by rescuing Senator Charles Percy at Dak Son when their inspection party came under mortar attack. The Government of South Vietnam decorated him for saving a downed pilot.

Mr. Smith will discuss the serious plight of refugees in South Vietnam at an open meeting of the Brookhaven Moratorium Committee in the North Room of the Brookhaven Center on Thursday, August 6, at 8:30 p.m.

This non-official program is open to all Laboratory employees. Families and personal friends may accompany staff members on this occasion.

Attention All Bowlers

Mixed League

Deadline August 14, 1970

Men's & Ladies' Leagues (priority)

Deadline August 19, 1970

All Men's & Ladies' Leagues

Deadline August 21, 1970

Entry blanks will be distributed shortly.

Arrivals & Departures

Arrivals

Peter J. DiPalo	Physics
Edward H. Zellner	Central Shops

Departure

Mary Ellen Haase	Staff Services
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BROOKHAVEN BULLETIN

Published Weekly for the Employees of Brookhaven National Laboratory

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NORBERT J. DERNBACH
Public Relations Officer

Letters To The Editor

Dear Sir:

The family of Jerry Floyd acknowledges the kindness of the BNL Staff for many years, as well as sympathy at a time when it was deeply appreciated.

Brenda and Drew Floyd
Mr. and Mrs. Donald Floyd
Ronald Floyd

Dear Sir:

The July issue of the *United States Soccer News* described the game played between BNL and the former American League All Stars at which the game ended in a 4-4 tie.

The publication was lavish in its praise of the fine playing field, the goal posts, and other equipment that BERA has provided for its employees. And so to BERA a heartfelt thank you from all of us!

BNL Soccer Players
John McCafferty

Recreation Building Available Evenings

The Recreation Building in the Apartment Area is open for general use each week day evening, Monday through Friday, from 5:15 to 11:00 p.m.

The building is open as a lounge and meeting place. It features kitchen facilities, dance floor, club rooms, a new game room, picnic area, television, pool table, ping-pong, magazines, playing cards, record player, radio and refreshments.

Group or Department parties are encouraged and reservations will be made for the building's exclusive use. A list of party equipment is available at the Recreation Office. Call Extension 2808 for further information.

The Recreation Building is used primarily for employee scheduled activities and upon occasion incidental equipment will not be available for general use. During the evening schedule children will not be permitted unless accompanied by an adult.

Cafeteria Menu

Week Ending August 6, 1970

Friday, July 31

Clam & Celery Bisque	
Fried Stuffed Flounder w/Tartar Sauce & 1 Veg.	.90
Broiled Halibut w/Lemon Butter & 1 Veg.	.90
Braised Meat Balls w/Veg. Gravy & Mashed Potatoes	.80
Monday, August 3	
Vegetable Soup	
Round Roast of Beef w/1 Veg.	.80
Veal Patty & Tomato Sauce w/1 Veg.	.85
Spaghetti w/Meat Balls in Hunter Sauce	.75
Tuesday, August 4	
Puree of Split Pea Soup	
Baked Ham Hawaiian w/1 Veg.	.80
Braised Chicken Legs w/1 Veg.	.80
Chili Con Carne on Rice w/Tossed Green Salad	.80
Wednesday, August 5	
Chicken Gumbo Creole Soup	
Beef Chop Suey on Rice	.80
Fried Filet of Sole w/French Fries	.90
Ravioli w/Cheese & Tossed Green Salad	.80
Thursday, August 6	
Turkey Noodle Soup	
Broiled Link Sausages w/Apple Sauce & 1 Veg.	.85
Baked Macaroni Au Gratin w/Bacon Strips	.70
Beef Steak Pie w/Vegetables & Biscuit Crust	.90

Classified Advertisements

Positions Available

The Brookhaven Bulletin each week will list job openings which have come to our attention and may be of interest to Lab employees. Each listing will be repeated (if still available) only once.

- LABORER (1) - Plcmt Eng. & Planning.
Application Deadline: August 5, 1970.
- PERSONNEL REPRESENTATIVE - Replacement for I.W. Cole - Personnel Division.
- SECRETARY II - Medical Department.
- REGISTERED NURSES - Medical Department.
- TECHNICIAN (Counting Room & Bioassay) - Instrumentation and Health Physics Department.
- CLERK TYPIST - Staff Services.

For further information, please contact Employment Supervisor Ext. 2109 or 2513.

Autos & Auto Supplies

- 67 VW - Beige, excel cond, good tires, radio. \$1000. Bill, 751-2637.
- 65 MGB - Lt blue, r/h, wire wheels, overdrive, tonneau, new tires, luggage rack, excel cond. \$1100. D. Kazmark, Ext. 2459, 289-0265.
- 2 SNOW TIRES - 7.35x14, used 2 mos. \$40. Ext. 2421.
- 59 - 3.4 LITER JAGUAR SEDAN - Good mech cond, new tires, recent valve job. T. Kitchens, Ext. 7396/7300.
- 62 VALIANT - Auto trans, radio, snows, good mech cond. Ext. 7581.
- 66 THUNDERBIRD - Air cond, ps/pb, pwr windows, 40,000 orig mi. GR5-7480 after 6:30.
- 65 CHEVY IMPALA CONV - Red, 396, 4 spd, r/h, am/fm radio, tach, very good cond. Bill, 281-4288.
- 62 MG MIDGET - Red, custom int, new top, brakes, Michelin X tires, paint, rebuilt eng, must be seen. Frank, Ext. 2395.
- 63 CHEV IMPALA - 4 dr htdp, V8, ps/pb, auto trans, new carb & batt. \$325 firm. 281-5289.
- 63 FIAT 1200 - Rebuilt eng & carb, 2 good Pirelli radials, body needs a lot of work. Asking \$150. 878-9664 before 6.
- 64 TRIUMPH TR4 - Rebuilt eng, new trans, brakes, radial tires on mags, many extras, perf. Please call, baby needs shoes. Ext. 2753, 732-9102.
- 8.85x14 W/W TIRES - (Not bad either). \$15/all or will swap for 2 wide Chevy rims. S. Anderson, Ext. 2411.
- 64 MG MIDGET - British racing green, r/h, wire wheels w/extra wheel & snow tires. 473-5546.
- 66 CHEVY IMPALA STATION WAGON - V8, auto trans, ps/pb, new tires, 57,000 mi, avail 8/27. \$1000. R. Stearns, Ext. 659, AT6-6889.
- 2-13" RIMS - From Mercury Comet, w/1 snow & 1 reg tire. Both/\$5. Al, Ext. 7177.
- 59 PLYMOUTH - 6 cyl, std shift, everything works, 59,600 orig mi, 5 good tires. \$50. Al, Ext. 7177.
- 59 JAGUAR MK IX - Excel for parts. \$150. Charlie, Ext. 322, YA4-6343.
- 2-15" RIMS - For Chrysler product, both/\$7; 50 DODGE - best offer. O. Booker, Ext. 2411.
- 60 PONTIAC BONNEVILLE WAGON - Air cond, ps/pb, auto trans, r/h, eng & tires very good, body fair, state insp 7/70, come see, come drive. Rolf, Ext. 638.
- 70 MACH I - Red. 351 CD-4V, air, stereo am/fm & tape, polyglas tires, racing suspension. 289-1513.
- 68 FIREBIRD - Hdtb, 17,000 mi, like new, ps/pb, console, air cond, r/h, 3 yrs left on factory guar. \$2300. Ext. 379, LT9-3269.
- LUGGAGE CARRIER - Gray vinyl w/full length zipper, for station wagon rack, used once. \$15. Ext. 623, 286-8446.
- 67 FORD GALAXIE 500 CONV - V8, auto trans, ps. Asking \$1295. Ted, Ext. 2589.
- 1-8.25x15 W/W TIRE - On rim. \$6.50. Whitey, Ext. 2179.
- 68 VOLVO 155 - 4 dr, blk, low mileage, very good cond. Ext. 2989, 473-7657 eves.
- 68 BUICK WILDCAT CUSTOM - 2 dr htdp, ps/pb, pwr seat, air cond, 14,000 mi, showroom cond. \$2300. I.J. Muzinich, 473-6370 after 6.

- 63 MERCURY COMET - Auto trans, 6 cyl, r/h, good rubber. J. Bracker, Ext. 2387.
- ROOF RACK - Sears, mounts on gutter, fits most cars. Bob, Ext. 7615.
- 63 FORD GALAXIE CONV 500XL - Blue/white top, ps/pb, V8 cruiseomatic, am/fm, 4 new tires, new batt & muff, good cond. \$500. Ext. 2524.
- 65 MUSTANG - V8, std trans, 4 new tires, excel cond. \$900. Mort, Ext. 2450, AT6-8448.
- 65 HONDA MOTORCYCLE - 305 Super Hawk, excel cond. \$400. FR9-5155.
- 64 VALIANT SIGNET - Bckts, ps, good tires, new batt, owner needs larger car. H. Ringel, Ext. 7362.
- 64 CHEVY IMPALA S/S CONV - 4 spd, 327 V8, ps. \$750. Ext. 2492.
- 64 OLDS VISTA CRUISER WAGON - Auto trans, ps/pb, V8 eng. Best offer over \$550. R. Baldwin, Ext. 7686/7525.
- 66 YAMAHA MOTORCYCLE - 60 cc, 2800 mi, good cond. \$125. L. Zologa, Ext. 2852, 475-4557.
- 54 CHEVY - Std shift, good cond, new tires. \$75. Tony, Ext. 7355, AT6-0102.
- 63 ENGLISH FORD CORTINA - \$75. Ext. 2834, 744-5079.
- 59 PLYMOUTH - 4 dr, V8, auto trans, good transportation for its age. \$125. R. Clipperton, Ext. 7821, 924-8644.

Boats & Marine Supplies

- BOAT TRAILER - 1968 Rocket tilt bed, fully equipped, carry up to 17' boat. 751-2713.
- 20' SAILBOAT - Egyptian cotton sails, anchor, winter cover, in water, sacrifice. AT6-8926.
- SAILBOAT - Skimmer Seadog 9 1/2' fiberglass, dacron sail, oars & oar locks, used 1 season, excel cond. \$380. P. McHugh, Ext. 7164, 586-3579.
- 8' ALUM PRAM - & 3 hp Johnson motor. very good cond. \$105. S. Anderson, Ext. 2411.
- 18' TROJAN - Inboard (Gray Marine 70). D. Grant, 288-1707 after 6.
- RADIO DIRECTIONAL FINDER - Gladding Cyclone, portable, brand new, never used. \$50. Joe, Ext. 576.
- 18' CHRIS CRAFT SEA SKIFF - Lapstrake, valve job & new water pump, in water, ready to go, must be seen to be appreciated. \$1200. J. Fedelem, EM3-6341.
- 15' THOMPSON - 50 hp Johnson. \$400. John, 722-3043.
- 19' PENBO - Sleeps 2, stand-up head, navy top, 50 hp Evinrude. \$500? 878-1450 after 6.
- TIGERCAT - 17' sailboat, catamaran, good cond, w/wo trailer. Harold, Ext. 7321, 298-4349 after 6.
- 40 HP EVINRUDE - Manual start, late '69, short shaft, low hours. \$525. Goff, 363-6643.
- 22' CABIN CRUISER - W/40 Evinrude elec, two bunks, sink, nice combo. Jim, Ext. 7559.

Miscellaneous

- LADIES' FIGURE SKATES - Hyde, 7 1/2, excel cond. \$10. Borg, Ext. 2924, 286-0428.
- MINI SURFBOARD - Harbor Rapier (custom) 8', soft V bottom, wave set fin, excel cond. \$85. Ext. 7413, 286-8134.
- EXA 35 MM REFLEX CAMERA - W/filter, acces, waist level hood & range finder, pre-set lens, new cond. \$75. Ext. 614, 878-4089 after 6.
- GLASS SURF ROD - 11' long, & salt water spinning reel, little used. \$25. 924-3936.
- 2 TICKETS TO LA BOHEME - NY City Opera, Sunday pm, 9/13. Craig, Ext. 7396.
- BABY CRIB - Dresser, English coach carriage, play pen; 2 blk leather benches, rattan chairs, car carriage, swingomatic. AN5-2453.
- CAMERA - SLR 35 mm Exakta VX w/2.8 50 mm preset Jena Tessar lens, shutter speeds to 1/1000 sec, delay timer, etc. \$60. B. Garfinkel, Ext. 7353, 587-9372.
- POOL FILTER - W/3 way valve, for use on 5000 gal pool. \$25. John, 653-4571 after 5:30.
- DRUM SET - 7 pc, blue mother of pearl, good for beginner. Orig cost \$700, must sell \$125. Gatti, 669-7576.
- SHOTGUN - Browning Sweet 16. \$150. John, Ext. 560.
- TAPES - Cassette, country & western & rock, brand new. \$3 ea. Susan, Ext. 670.
- WALNUT COFFEE TABLE - 36" round, 14" high w/glass insert, \$25; Voigtlander automatic camera, 35 mm, w/Lanthar 3:8/50 lens, \$15. 744-2797.
- 18" HAND MOWER - S5. Earl, 286-3829.

- MOVIE CAMERA - Kodak Hawkeye, 8 mm, \$5; photo equipment bag, \$2; all excel cond. 744-2797.
- GERMAN SHORHAIR POINTERS - AKC, whelped 7/4. T. McKinley, Ext. 2126.
- 18" WESTINGHOUSE ELEC MOWER - Bought new last spring, 1/2 hp, 1725 rpm. \$30. Earl, 286-3829.
- ELEC PAINT SPRAYER - Holds up to 2 1/2 gal, long hoses. \$40. Earl, 286-3829.
- COLOR TV - 25" console model on swivel, excel cond, doesn't fit in new den, 2 yrs old. Gladys, 473-7969.
- AKC COCKER SPANIELS - 1 male, 1 female, tri-color, ch. background, show quality, 7 wks old. \$125 ea. 273-9628.
- ACORN VENDING MACHINES - 8 machines, 4 stands, extra parts. All for \$50. GR5-7372 after 5:30.
- 3 ELEC FANS - \$7, \$5, & \$3; baby carriage, like new, Bilrite coach, \$25; chest of drawers, white, \$25. Ext. 7143, 281-8390 after 6.
- GIRLS' BICYCLE - 26" Rudge, excel cond, gears, etc. \$25. Dolores, HR3-2879.
- BICYCLE - Girl's, 26", lg basket, barely used. \$30. Dietrich, Ext. 2351.
- REFRIG/FREEZER - Westinghouse, 13.5 cu ft refrig w/cross top freezer, compl frost-free, many extras, still under warranty, excel cond, owner moving. \$225. Conn, Ext. 7411.
- PUTTING GREEN - Jacobsen lawn mower w/basket & carrier, A1 shape, will negotiate, make offer. AT6-9485.
- VM PORTABLE RECORD PLAYER - All spds, w/stand. \$5. Al, Ext. 7177.
- BABY ITEMS - Stroller, swivel wheels, canopy, basket, good cond; bassinette, lg basket type, folding legs w/rollers. \$8 ea; both/\$15. 289-8521.
- DROP-LEAF BUTTERFLY TABLE - Solid "Whitney" maple, seats 8-10, very good cond. \$50. Ext. 322.
- FURN - White crib, \$10; matching chifferobe, \$15; white bathrm sink, never used, \$10; old stuffed leather chair, \$3; melmac for 12, \$7. Ext. 623, 286-8446.
- AIR COND - Philco-Ford, used 1 season, 9000 BTU, 115 v, excel. Asking \$135. Ted, Ext. 2589.
- ENGLISH SPRINGER SPANIELS - AKC, 9 wks, champion bloodlines, ideal pets, sacrifice. 473-5466.
- BABY CARRIAGE - English high perambulator, Charlotte by Marmet, converts to car bed, chassis folds, excel cond. \$40. M.T. Hutchings, 744-2727.
- TRIPOD - Hobby, deluxe elevator 330. \$15. H. Donnelly, Ext. 2900.
- BOOKCASES - Pr 84"x36"x12", adjustable shelves, fruitwood finish. \$30 ea, \$50/pr. Bob, Ext. 7615, 928-1171.
- TAPE RECORDER - Panasonic RQ-500, 5" reel, plus 7 tapes. \$50. H. Donnelly, Ext. 2900.
- FURN - White contour chair, \$2; turquoise uphol chair, \$10; walnut kitchen table, \$8; window fan, \$8; misc drapery rods. Bob, Ext. 7615, 928-1171.
- CARPET - 3 yr old Lees 12'x20' acrilan, amber gold random shear, w/pad, excel. New \$300, sell \$100. Bob, Ext. 7615, 928-1171.
- BABY THINGS - Carriage, crib, mattress, bumpers, playpen, feeding table, car bed, gate, bathtub; all excel; half price. Bob, Ext. 7615, 928-1171.
- DESK LAMP - Twin bulb fluorescent goose-neck, w/ bulbs. \$7. Bob, Ext. 7615, 928-1171.
- Bb CORNET - Good cond, plays well, suitable for beginner or advanced player, reasonable. Bill, Ext. 2392.
- TAPE RECORDER - Webcor, 2 track mono, portable case, records in both directions, works but needs adjustments. \$25. R. Parsick, Ext. 2384.
- BIRD CAGE - Like new cond. Ben, Ext. 2588.
- STURDY CRIB & MATTRESS - \$15; matching chifferobe, \$15; all excel cond; end tables, \$5/both. 265-3982 after 6.
- DINETTE SET - Table, chairs, china w/drawers, \$25; bedrm set, twin beds, springs, mattresses, highboy, \$60. 281-8557.
- KITTENS - Free, any one or all 5. George, Ext. 7168, 475-3792.
- DRESSER - Antique blue, w/mirror. \$35. 744-6636.
- LAWNMOWERS - Jacobsen 18". \$30; W.T. Grant 20". \$20; Craftsman 18" very light. \$15; all excel running cond. Ext. 597, 286-0436.
- RIDING LAWNMOWER - Moto-Mower, 26", 3 spd fwd, reverse, separate blade spd, heavy clutch & transaxle units. \$125. Ext. 597, 286-0436.
- CHAIN SAW - Gas type, Pioneer, 20", excel running cond. \$45. Ext. 597, 286-0436.
- COMPL HI-FI SYSTEM - Monaural, fm tuner, amplifier, Garrard AT6 changer, 8" speaker, w/RJ enclosure, excel cond, best offer. Ext. 7753, 286-3742.
- TODDLER'S TRICYCLE - 10" front wheel, good cond. \$15 or best offer. 286-3742.
- TOY AUTO-PEDAL DRIVE - Fits 3, 4, 5 yr old, \$5; younger child's "walker" auto, \$1. AT6-8724.
- COSCO FEEDING CHAIR - Folding, stainless steel tray, converts to youth chair. \$9; chest, under bed, metal. \$3. AT6-8724.
- SEARS OUTSIDE FRAME UMBRELLA TENT - 11'x11', excel cond. C. Martins, Ext. 2852.
- INSTANT HAIRSETTER - "Kindness", by Clairol, new, was \$25. sell \$20. Ext. 322.
- GAS DRYER - Westinghouse, DGH 400, fully auto. \$85. 744-6636.
- WASHER - Whirlpool, LRA 880, 2 spd 5 cycle. \$110. 744-6636.
- DISH WASHER - Westinghouse, perf cond. \$85. 744-6636.
- CHEST - Painted orange. \$25. 744-6636.

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

- FARMINGDALE - 3 bedrms, brick ranch, immaculate, rustic finished basement w/bar & fieldstone fireplace, 60x120 slate patio, compl fenced & landscaped, many extras. \$35,000. CH9-3497.
- SALE OR RENT - Brookhaven, Colonial ranch, 4 bedrms, 2 1/2 baths, liv rm, din rm, paneled fam rm w/ fireplace, dine-in kitchen, laundryrm, basement, 2-car garage. \$275/mo. 286-8134.
- N. PATCHOGUE - Summer bungalow, 4 rms, screened porch, must be moved from property, make offer. GR5-8830.
- ROCKY POINT - 3 bedrm ranch, oil h/w heat, 1/2 acre, near beach, low taxes, assume mort. \$20,500. Ext. 7167.

Wanted

- DAY SAILER/CRUISER - 15'-20', fiberglass. Elkind, Ext. 2298, 286-0783 eves.
- TO BUY - Old china or bisque dolls, also bodies, heads or parts. GR5-4199.
- GOOD HOME - For young female dog, house-broken, well trained, wonderful w/children, baby is allergic. 286-1076.
- SHOTGUN BARREL - Winchester M12 feather wt, 12 ga, 30" full choke. Bill, Ext. 7693.
- TO RENT - Unfurn house/apt, 1 bedrm, newly married couple, rental to begin 9/70. Gatti, 669-7576.
- BUNK BEDS - W/wo mattress, inexpensive; snare drum for beginner. Jackee, 732-1632 after 5:30.
- HOME - For 1 1/2 yr old male hunting beagle, house-broken, gentle w/children. Jerry, Ext. 2715.
- 2 LG BAGGAGE TRUNKS - For moving purposes. Jerry, Ext. 2715.
- WILL TRADE - 2 Plaid Stamp bks for 2 Triple S stamp bks. Ext. 2200.
- BABYSITTER - Your home or mine, Rocky Pt-Shoreham area, flexible hours. Slatkin, 744-1942.
- CLICHES - E.G., don't take any wooden nickles, for summer students compiling a dictionary of tired phrases. M. Samberg, Bldg. 510, Physics.
- BUY OR RENT - House, couple & 4 children ages 3-12, handyman's special will do. 475-7372.
- OUTBOARD MOTOR CONTROLS - 14'-16' boat. Jim, Ext. 668/2154.
- ROOMMATE - To share 5 rm house in Riverhead, share expenses, clean cut guy only, references. 727-6437, 6-8.
- DARK ROOM EQUIPMENT - Any used or surplus dark room equipment needed by 2 high school girls, serious photography students, limited budget. Betsy, Ext. 7552.

Carpools

- PAYING RIDER - From either Exit 19 Southern Pkwy, Hempstead or Exit 57 LI Expwy, Central Islip. F. Davis, Ext. 2969.
- SUMMER DRIVER WANTED - In existing carpool from Exit 52 (or further west) on LI Expwy. Elliot, Ext. 2103.
- DRIVER - To join existing 2-man carpool from Pt Jeff. Dick, Ext. 2108/2305.
- EXISTING CARPOOL - Needs additional driver, E. Setauket/eastern section of Stony Brook area. Hooper, Ext. 2824.
- PAYING RIDER - Needs ride to and from Holtsville, 8:30 to 5:00. Barbara, Ext. 2105.

Lost & Found

- FOUND - 1-2 yr old male beagle, w/blk spotted body, brown & white face, Mastic-Shirley area. Jerry, 281-7840.
- LOST - Brookhaven Center, gold high school ring w/blue stone. A. Alfano, Ext. 623.

Tutors Needed

The North Bellport Community Action Committee, Inc. (an OEO sponsored organization) is badly in need of tutors for Junior High School students in mathematics, science and social studies. The tutoring sessions are held Tuesday evenings at the North Bellport Community Center.

Any summer students, or others, who would be interested in helping out, should contact John Dietz on Ext. 591, 7247, or 286-8122. Transportation can be provided.

Theatre Group News

Activity has started on the Fall production of the Theatre Group, *A Lion in Winter*. The play will be directed by Sheila Buck, and will be presented on November 13, 14, 20 and 21, 1970.

Tryouts for parts will be held on August 24, 26, and 27 at 8 p.m. in the BNL Theatre. There are two women and five men in the cast. Scripts are on order and should be available prior to the tryout dates. Those interested in trying out for a part or helping backstage, are invited to come to the Theatre on any of the listed dates. —Pat Towey

Coming Attractions

- 7/30 BERA Movie - "Hiroshima" and shorts. Berkner Hall - 8:30 p.m.
- 8/6 BERA Movie - "The Navigator" and shorts. Berkner Hall - 8:30 p.m.

Classified Ad Policy

Deadline is 12 noon Friday for publication the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Firearms offered for sale or trade may not be brought on site.

5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated.
7. Ads should be restricted to 20 words or less and typed or printed on the form provided, and must bear the employees signature.

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

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 112, 40 Brookhaven Avenue.

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

Send to: Brookhaven Bulletin, 40 Brookhaven Avenue

(Name & Phone No. To Call)