

## A Novel Technique to Filter X-rays

They have given themselves about a year. It's an ambitious time schedule for what they have in mind. Their goal is to demonstrate a novel technique of using nuclei to filter x-rays from the National Synchrotron Light Source (NSLS). The resulting x-ray beam would have an extraordinarily small energy width, uniquely applicable in a variety of research areas.

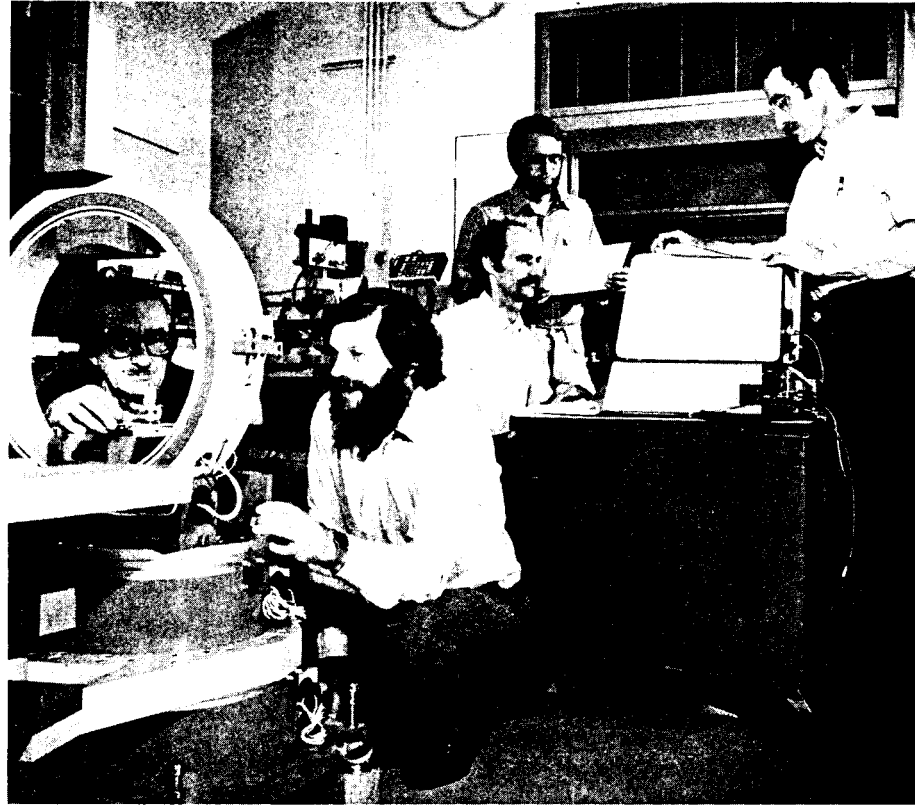
The project involves a collaboration of scientists: Peter Haustein, J. Robb Grover, and Gyula Faigel in the Chemistry Department; and Jerome Hastings and D. Peter Siddons at the NSLS. Faigel, who is on leave from the Central Institute for Physics Research in Hungary, came to work specifically on this project. The rest of the group spend most of their time on other research. The x-ray project is headed by Peter Haustein and supported by BNL's Exploratory Research Program, which was established in 1984 to provide seed money to scientific projects that show promise and that need further development before regular sources of funding are sought.

### A New Field

"This is a brand new field," says Haustein, who can name only two earlier attempts, both outside of the United States, to achieve an extremely narrow energy beam of x-rays from synchrotron radiation. He says the more successful work was done about a year ago at DORIS, which is the part of the German accelerator DESY that makes synchrotron light.

The BNL group aims to produce a beam a thousand times brighter than the one at DORIS. Giving them a head start is the fact that the NSLS is much brighter.

The NSLS produces "white" light that contains a broad spectrum of light at many wavelengths. But because most experiments need light of a particular wavelength, a monochromator is used to do the selecting. Monochromators commonly operate by scattering x-rays off electrons, and this is fine for a number of important applications, for example, crystallography. There are limits, however.



In the foreground, J. Robb Grover (left) and D. Peter Siddons are adjusting a crystal in a goniometer, a device that can orient the crystal at various angles with respect to an x-ray beam. In the background, Jerome Hastings (right) is providing input data to Gyula Faigel (seated), who is running programs for analyzing nuclear Bragg scattering experiments on a personal computer. Peter Haustein is looking at printed results from the computer analysis. All are involved in an exploratory research project that will demonstrate filtering of x-rays with nuclei.

Says Haustein, "If you want an exact wavelength or energy, it's tough. To get a very, very small energy width, you can't rely on scattering x-rays off electrons. Instead, you have to scatter off nuclei to get the desired energy resolution. And only x-rays within a very narrow energy range can excite nuclear levels." In physics parlance, this technique is called nuclear Bragg scattering.

### Specifics of the Beam Line

Here is how the BNL experiment will work. Light from the synchrotron will first enter a two-stage pre-monochromator, where it will scatter once off silicon and a second time off ger-

manium. The pre-monochromator is specially designed to preselect x-rays with the energy of 14.4 thousand electron volts (keV) and as small an energy width as practical using electronic scattering of the x-rays. This beam will then intercept one or more specially prepared crystals of iron oxide enriched with iron-57 nuclei. (The 14.4 keV matches the energy of the lowest excited state of iron-57, a stable nucleus that makes up about 2% of all iron atoms in nature.) The x-rays scattered by the iron-57 nuclei in the crystals will then enter a detector system.

(Continued on page 2)

## New VP at AUI

His name is Thomas J. Davin Jr. and he is the recently appointed Vice President - Corporate Affairs of Associated Universities, Inc. (AUI). He will also have the duties of Controller and General Counsel.

The titles may sound complex but his new job is quite clear-cut, says Davin. To put it briefly, he has corporate responsibility for the business and financial matters of BNL and NRAO. Breaking this down a little further, he will deal with the prime contracts between DOE and BNL, and between NSF and NRAO. At the corporate level, he will coordinate administrative policy at the two laboratories; keep his eye on corporate investments; and oversee legal matters. In the latter he will be assisted by Michael Goldman, AUI Deputy General Counsel, who is also the BNL Counsel. The staff of the Internal Audit Group, headed by Frank Federmann, will report directly to Davin.

Davin comes to AUI after 30 years in government. He retired recently as Deputy Director of DOE's Procurement and Assistance Management Directorate. The Directorate is responsible for the functional management of DOE's procurement, assistance, industrial mobilization and personal property activities.

In 1957, with two years in the U.S. Air Force behind him and an M.A. in government and public administration from St. Louis University, he went to Washington as a manage-

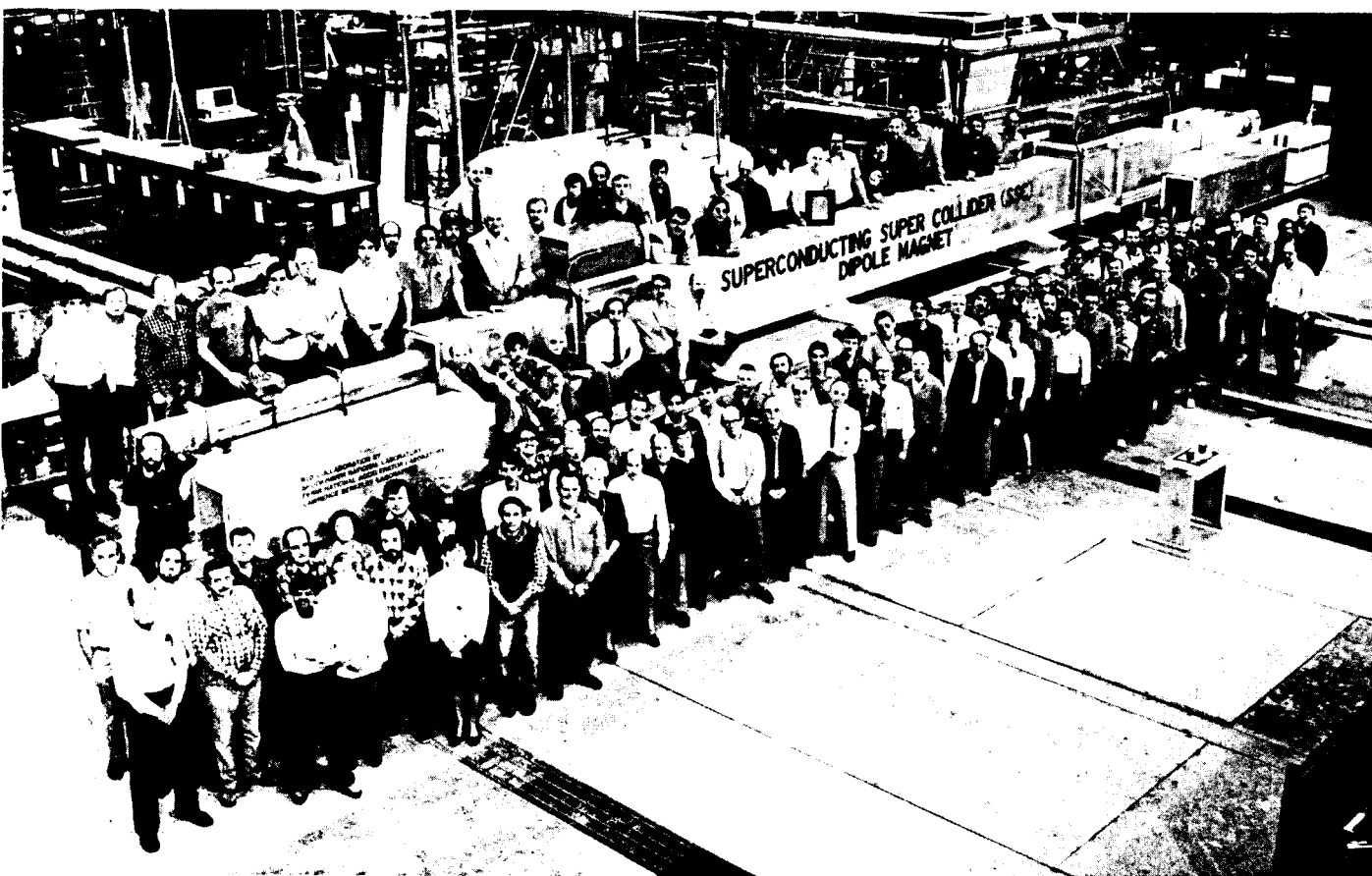


Thomas Davin

ment intern at the Atomic Energy Commission. By 1963 he was an inspection specialist and had acquired a law degree at Catholic University. He remained at the AEC and its successors, the Energy Research and Development Administration and the Department of Energy. In fact, he held the same job in Washington — Director of the Contracts Business Clearance Division — when the agency went from the AEC to ERDA to DOE in the 1970's. Other senior positions he filled at DOE included deputy director, Office of Procurement Operations; and director, Office of Policy, Procurement Directorate. He is admitted to the Bar in the District of Columbia.

Although he traveled a great deal in his 30-year career and is familiar with national laboratories, particularly Argonne and Fermilab, last week was only the second time he had been at Brookhaven. He will be based in Washington, but expects to be in residence at Brookhaven about one week per month.

Davin is a strong believer that research is important to the future of the country and says he is pleased that after a rewarding career in government he can continue in the field of public service through AUI.



Members of the Accelerator Development Branch of High Energy Facilities gathered to speed the first SSC full length prototype dipole magnet on its way to Fermilab. The 17-meter magnet was loaded aboard a flat-bed truck on April 24 and arrived safely in

Illinois. The magnet, which was fully assembled at BNL, is now being tested at Fermilab. First reports indicate that it has passed preliminary electrical tests.

# Volleyball — The Net Effect

## WANTED

**Volleyball Team** - 7 or 8 "over the hill" athletes desiring to compete in volleyball league being formed. Spirit willing but flesh weak guys preferred. Play after work once a week starting October. Call G. Jackson, Ext. 396.

A lot has changed since that ad ran in the Bulletin Board of September 16, 1959. The Volleyball League has mushroomed from four teams to 25. The 25 teams are spread over four leagues, which take over the gymnasium for official games on Monday and Wednesday evenings, for pick-up games on Saturday mornings and for practice at lunchtime on Thursdays. And guys have been joined by gals in all leagues.

In volleyball, which originated in Holyoke, Massachusetts, in 1895, each team has six players arranged in set positions on one side of a net almost eight feet high. The object of the game is to "volley" a large inflated ball back and forth over the net between two teams. Each time a team fails to keep the ball in play, the other team gets a point and the serve. To serve, the player in the rear right position (facing the net) strikes the ball to send it over the net. That player serves until his or her team fails to keep the ball on the other court. When the serve returns to the first team, the players rotate clockwise so a different person serves. Play continues until one team has at least 15 points and is winning by at least two points.

Volleyball League President Bob Marascia explained that the league is structured to allow everyone to play this exciting game at his or her own level and to have fun doing it. Each of the three Mixed Leagues represents a different level of skill, but all follow rules designed to compensate for the fact that, in Olympic play, the net would be lower for women than for men. These rules include prohibitions against overhand serves and hard spiking, and the requirement that, if a ball is hit on one side three times running, one of those hits must be by a woman. The fourth league, the Open League, also includes women but follows official volleyball rules. Like Marascia, who plays on the Bumpers in the Mixed League and the Court Jesters in the Open League, many players enjoy both types of competition.

In all, over 200 employees participate in BNL volleyball. Dennis Weygand, captain of Phoenix and a member of the Dinkers, likes the sport because "it's convenient. It's right here at the Lab and I'm too old for basketball." Pat Webster of Net Results likes it "because it's a team sport and my favorite sport. And it's a good tension reliever and a challenge." And Kathi Barkigia, who plays for X-Rayted, admits, "I like volleyball better than softball. I like the competition and you get a lot of exercise."

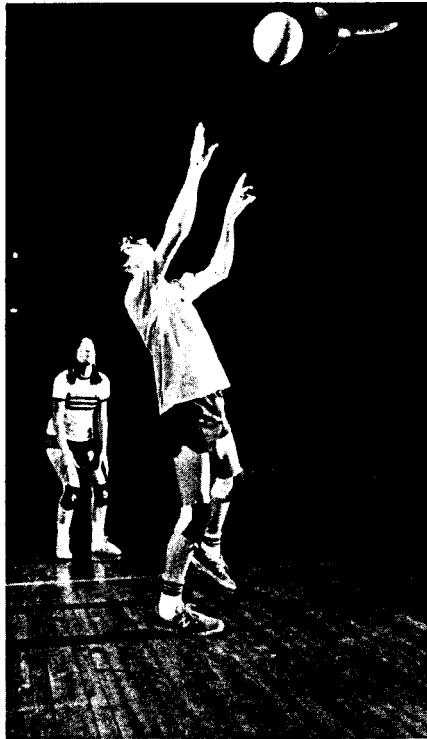
To make sure everyone follows the appropriate rules, each game is refereed by two other members of the same league. The Volleyball League's Chief Referee is Frank Haibon, who plays for the Phoubars and the Court Jesters. It's his job to train other referees, who are paid by the League for their services.

The volleyball season, which runs from October through May, has just concluded its final phase — the playoffs.

Congratulations to the winners:  
Open League - Odds & Sods  
Mixed League I - Dinkers  
Mixed League II - Phoubars  
Mixed League III - Printouts

So as not to influence the outcome of any playoff game, these photos by photographer Mort Rosen were taken during practice.

— Anita Cohen



Eric Kneedler (Light 'n Lively) puts his all into this set of the volleyball, as Nancy Lazarz (Light 'n Lively) remains alert for whatever happens next.



Barbara Royce (Nuts & Bolts) "bumps" the volleyball toward players closer to the net. Behind her are Bill Stuono (The Buddys) and Eric Kneedler (Light 'n Lively).



Nancy Lazarz (Light 'n Lively) "blocks" an attempt by Pete Stillman (X-Rayted) to send the ball into her court.

—photos  
by  
Rosen



Peter Lane (captain, Chungas Revenge) and Vladimir Kirzhner (right) jump towards a mutual goal: getting the volleyball back over the net, but away from the waiting arms of Bill Horak.

## X-rays

(Cont'd)

"A trick is employed here," says Hausteijn. "Because of special crystallographic properties, the iron oxide crystals can be oriented in the x-ray beam to suppress ordinary electronic scattering and still permit nuclear scattering to take place and be detected."

Crucial to the success of the experiment is how well the pre-monochromator works, how perfect the crystals are, and how good a job the detector does of selecting only signals that come from x-rays from nuclear Bragg scattering. The pre-monochromator and the detector are being built by the BNL scientists. The crystals were grown by Joseph Remeika at AT&T Bell Labs, with iron-oxide material enriched to 93% iron-57 on loan from Oak Ridge National Laboratory. Earlier, Remeika made some practice crystals of natural iron so that the BNL group could check that they are of suitable quality.

X-ray beams from nuclear Bragg scattering, as the BNL scientists hope to do it, will be an improvement on nuclear resonance (Mössbauer) spectroscopy, which relies on radioactive sources. "Nuclear Bragg scattered beams are brighter and more convenient to use," says Hausteijn, "and there are a number of isotopes to be studied for which Mother Nature has not provided the appropriate radioactivity. So we will be able to do studies that simply were not possible before."

What Hausteijn is saying is that by

using crystals made of different materials and by adjusting the pre-monochromator, the scientists can study different systems. Iron-57 was the first choice for the project because perfect single crystals of its oxide can be made. Also, the energy and lifetime of the iron-57 excited state nicely match the capabilities of the NSLS to produce intense x-ray beams at 14.4 keV.

### The Payoff

The first part of the program is to get a good, bright, monoenergetic beam. "Then the big payoff is research — studies of systems that haven't been accessible up to now," says Hausteijn. "We have a long list of experiments that we would like to do with such a beam." These experiments include studies of semiconductors, magnetic materials, metallic glasses, and the dynamics of chemical reactions. "We would also like to look at model systems for x-ray lasers that may eventually operate by stimulating the de-excitation of nuclear isomeric states."

"The beam line is going to take a lot of fine tuning and fussing with," adds Hausteijn, "but the group hopes to do a demonstration experiment in the next year or so."

— Mona S. Rowe

## Note to Travelers

Take a minute to look at your Avis Discount Card. If the number is A/A298900, the card is not valid. Please come to the Travel Office for a new card.

## Speakers Bureau

**Eleanor Grist** (Bio.); **Avril Woodhead** (Bio.), 21st Annual Science Fair at Shelter Island High School, Science Fair Judges, January 10.

**Lewis Jacobson** (PE), Suffolk County Boy Scout Troop #117, General View of Photography, January 14.

**Meyer Steinberg** (DAS), Rotary Club of Hicksville, Applied Research, January 16.

**Meyer Steinberg** (DAS), Long Island Forum for Technology, Engineers: Turning Ideas Into Reality, February 13.

**Betty Heldman** (Med.), Town of Islip Women's History Week, Careers for Women in Science, March 5.

**Jack Fontana** (DAS), Science Museum of Long Island, The Development of Polymer Concrete and its Applications, March 5.

**William Love** (Phys.), Villanova University, Particle Physics Research at BNL, April 2.

**Robert Brown** (DAS), Cub Scout Pack #243, Air Pollution, April 8.

## In Memoriam

James A. Johnson, General Communications Clerk, Staff Services Division, died suddenly on April 18. He was 45 years old. Johnson had been with the Laboratory since April 10, 1978. He is survived by his wife Nancy of the Nuclear Energy Department, and two sons, James A. Jr. and Daron. Johnson was a resident of Riverhead.

## Service Awards

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

### Thirty-Five Years

Jules B. Godel . . . . . Light Source  
Bernard F. McLaughlin . . . . . HEF

### Thirty Years

Carl I. Anderson . . . . . Nuclear Energy  
Margaret Dienes . . . . . Tech. Information  
Charles R. Staal . . . . . AGS  
Frank R. Thomsen . . . . . Applied Science

### Twenty-Five Years

Stanley S. Dobzeniecki . . . . . Plant Eng.  
Nancia Gargliardo . . . . . Staff Services  
Andrew P. Hull . . . . . S&EP

### Twenty Years

Robert Barone . . . . . Applied Math  
Andrew T. Como . . . . . Applied Math  
James A. Morris . . . . . Plant Eng.  
John P. Nicoletti . . . . . Central Shops  
Jose Sanchez . . . . . Plant Eng.  
Lawrence E. Toler . . . . . Physics  
Ralph A. Trondle . . . . . Applied Math

### Ten Years

Pilar Alverio . . . . . Central Shops  
Arlene F. Benkenstein . . . . . Plant Eng.  
Frances A. Burr . . . . . Biology  
Barbara J. Langella . . . . . Budget Office  
Charles P. LaSalla . . . . . Sfgds & Sec.  
Peggy L. Micca . . . . . Medical  
Joyce C. Montag . . . . . Applied Math  
James A. Niederer . . . . . Applied Math  
Charles J. Ruger . . . . . Nuclear Energy

## Self-Help Health Fair

Representatives of and information about some of the self-help programs and mutual-support groups on Long Island will be available on Thursday, May 8, from 11 a.m. to 2 p.m. in Berkner Hall. This Self-Help Health Fair, a Health Promotion activity of the Occupational Medical Clinic, is open to the Laboratory community.

The groups sending representatives include Mended Hearts (groups for open-heart surgery patients and their families), Parents Without Partners (single parent groups), American Lung Association (environmental health lobbying and smoking cessation workshops), Epilepsy Association, Disabled American Veterans (advocacy and support groups), Friends of Hospice (support for dying patients and their families), Women Returning to Higher Education (groups for women re-entering college), For Our Children & Us (advocacy for battered, separated and divorced wives and their children), Coma Recovery (support group for the families of head-trauma victims) and Reach Out to Parents of an Unborn Child (support groups for parents of stillborn and miscarried babies).

In addition, pamphlets and other information will be available from the Juvenile Diabetes Association, Phenix I (for drug rehabilitation), Autism Society, Early Childhood Direction Center (for learning-disabled children), Long Island Coalition for Adoption and the Independent Group-Home Living Program (for retarded adults).

All film badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.

## Are You Friendly With Your PC?

Discussion is now under way in Personnel and Applied Mathematics to develop a training program for new users of personal computers. Mary White, training and development administrator in Personnel; and Kurt Fuchel, Applied Math's manager of computer information and support services, are spearheading the effort.

More and more, secretaries and administrative assistants are using personal computers to enhance their productivity and efficiency. The user must acquire a significant amount of knowledge, not only of the PC itself, but also of the various software packages.

Says Fuchel, "There seems to be a view that PC's are so 'user friendly' that suitable instruction is not needed. The result is that a secretary is told: 'We're giving you this brand-new PC AT! Please learn Display Write 3, Lotus and dBase, while continuing to perform all your old duties.' This is both unfair and unproductive."

Whereas some classroom instruction is clearly desirable, how much is needed, and on what topics? Also, not all new users can be available to take instruction at the same time, let alone learn at the same speed.

Fuchel and White are already considering options such as off-site, vendor-supplied courses; on-site ones given either by outside consultants or BNL personnel; small informal groups, perhaps meeting during non-working hours; or PC-based tutorials with people available to answer questions.

Any comments and suggestions are welcome. They should be sent to White, at Bldg. 185, or Fuchel, Bldg. 515.

## Addled Addresses

Brookhaven Nut Lake  
Brookhaven Natl Laccelera  
Brooklawn Nat'l Lab  
Natl Lavs  
Brookhover Natl Lab  
Brackhaven Lab  
Brookhaven Natl Lab  
Upjohn, N.Y.  
And the much dreaded . . .  
Brokehaven National Laboratory

## Postscript

Last week, in honor of Professional Secretaries Week, radio station WALK invited listeners to call in each day to make nominations for a "Secretary of the Day". On Friday morning, Nick Tsoupas, a physicist with the Neutral Beam Division of the Department of Nuclear Energy, accepted that invitation. He nominated his group's secretaries, Ginny Diebel and Debbie Faivre, and they were chosen in a random drawing. A singing telegram to their office in Bldg. 902C announced their selection. Then at lunchtime, WALK announcer Robert Klein arrived in a white limousine, bearing flowers, prepared to take Diebel and Faivre to lunch. Though they were extremely honored, previous engagements prevented them from joining him.

## Arrivals & Departures

### Arrivals

Michael F. Clancy . . . . . S&EP  
Phyllis L. Strahm . . . . . P&GA

### Departures

This list includes all employees who have terminated from the Laboratory, including retirees:  
Frank H. Atkinson . . . . . AGS  
Mary S. Austin . . . . . Personnel  
Mark A. Catan . . . . . DAS  
Stanton H. Cohn . . . . . Medical  
Robert F. Doering . . . . . DAS  
Seymour Fink . . . . . DAS  
Joseph Forrest . . . . . DAS  
Warren J. Johnson . . . . . DAS  
Merrith T.E. Knight . . . . . Plant Eng.  
Frank T. Kulesa . . . . . DAS  
William E. Lenz . . . . . Physics  
Otto Peters . . . . . Plant Eng.  
Richard R. Skelaney . . . . . Plant Eng.  
Richard E. Stanton . . . . . Chemistry  
D. Hywel White . . . . . Physics  
William Wilhelm . . . . . DAS

## Retirement Notes

Carving decorative birds out of wood has been Ed Hunter's hobby for a long time. When the former site superintendent left BNL in May 1975, the Bulletin noted that he had already carved 35. Since then, from his Catskill retirement home in Margaretville, N.Y., he has increased that number to about 120.

Now, Hunter has donated his hand-painted, New York State birds to the state's Department of Environmental Conservation (DEC). The carvings will be on permanent exhibit in the Rogers Environmental Education Center at Sherburne, N.Y. In an announcement of the exhibit in the Catskill Mountain News, a DEC spokesman, said, "Mr. Hunter, a master carver, has long been considered a 'national treasure' in the community."



Ed Hunter's full-size, white pine model of a male wood duck.

His birds are true reproductions, exquisite in every detail. It is rewarding to know that now these birds will be permanently exhibited for both their educational and creative value."

## Check the Contract

If you require a contractor's services for home improvements, the Suffolk County Cooperative Extension offers the following tips:

- Make a list of the improvements you want done in order of importance.
- Request several estimates. Shop for price, quality and competence.
- Check references. Ask friends and neighbors for recommendations. Visit the sites of completed work and the contractor's place of business. Check the contractor's reputation with suppliers. Choose a firm that is licensed in Suffolk County.
- Get everything in writing. Contracts should include:

- start and completion dates.
- quality and types of materials.
- diagrams and sketches.
- payment schedule. Avoid making large deposits or advance payments to the contractor.
- written warranties on materials and workmanship.
- name and address of contractor's compensation carrier.
- statement that materials are free of supplier liens.
- responsibility for clean up.
- building and zoning permits.
- cancellation policy.
- Be at home while the work is in progress. Inspect each day's work and contact the contractor immediately if you are dissatisfied. Do not sign a completion certificate until all the work has been completed to your satisfaction and until you have proof that the suppliers have been paid.

## Cafeteria Menu

### Week of May 5

<b>Monday, May 5</b>	
Cream of chicken soup	(cup) .65 (bowl) .85
Chicken finger basket w/1 veg.	2.45
Pepper steak on confetti rice	2.45
Hot Deli: Veal Parmesan hero	2.65
<b>Tuesday, May 6</b>	
Turkey noodle soup	(cup) .65 (bowl) .85
Baked chicken w/1 veg.	2.45
Chicken burrito w/hot sauce and 1 veg.	2.45
Hot Deli: Pastrami	(bread) 2.30 (roll) 2.45
<b>Wednesday, May 7</b>	
Cream of mushroom soup	(cup) .65 (bowl) .85
Broiled filet of fish w/1 veg.	2.65
Polish style stuffed green peppers	2.45
Hot Deli: Smoked turkey	(bread) 2.30 (roll) 2.45
ALL YOU CAN EAT!!!	
Spaghetti with garlic bread	2.85
(No Take Outs)	
<b>Thursday, May 8</b>	
Chicken gumbo soup	(cup) .65 (bowl) .85
Super sausage pizza	2.45
Salisbury steak w/1 veg.	2.45
Broiled chicken livers w/1 veg.	2.45
Hot Deli: BBQ chicken patty	2.45
<b>Friday, May 9</b>	
Seafood gumbo	(cup) .65 (bowl) .85
Broiled flank steak w/1 veg.	2.45
Turkey sukuyaki on rice	2.45
Hot Deli: Denver sandwich on onion roll	2.50

## —BERA News—

### Cricket

The annual meeting of the Brookhaven International Cricket Club will be held on Thursday, May 8, at noon, in Room C, Berkner Hall. As usual, matches will be arranged against other clubs during the summer. Anyone interested in participating is invited to attend. For more information, call Dave Cox, Ext. 3818, or John Millener, Ext. 3853.

### Bowling

**Pink League**  
High games were bowled by Kathy Kisel 231, Sharon Smith 211/203.  
**Purple League**  
Clem Auguste rolled a 243, Ken Asselta 223/212, Joe Sheehan 222, Ken Riker 210, Ed Meier 203, Lee Barberich 202, Denise Miesell 200.  
**Red/Green League**  
J. Morris had games of 256/211 for a 642 scratch series, H. Marshall 220, R. D'Alsace 219, N. Combatti 216, R. Eggert 211, T. Prach 205, R. Larsen 204, E. Meier 203, J. Connelly 202/202, W. Kristiansen 201, K. Asselta 200, J. Petro 200.  
**White League**  
Jim Petro rolled a 221/201, John Hanlon 209, Dan Clemente 202, Ben Belligan 200, Frank Gaetan 200.

### Cooking Exchange

The Cooking Exchange meeting on Wednesday, May 14, will feature children's party favorites. Meetings are held in the Recreation Building on Wednesdays between 12:30 and 2:30 p.m. They are open to employees and their immediate families. A donation of \$1.25 per person entitles those present to a copy of the day's recipes, samples of the prepared dishes and coffee or tea. Babysitting is provided at 50¢ per child. For further information, call Madoka Miake, Ext. 3131; Sara Morse, Ext. 1712; or Susan Sears, 744-7831.

### Volleyball

The Volleyball Awards Dinner will be held at the Rock Hill Country Club in Manorville on Friday, May 16, at 6 p.m. Tickets are \$7 for league members and \$11 for guests. The price includes a hot and cold buffet, free beer and a deejay. A cash bar will be open. Tickets are available from the team captains and will not be sold at the door.

### R/C Model Plane Club

The regular monthly meeting of the R/C Model Airplane Club will take place on Tuesday, May 6, at noon, in the cafeteria. All interested are invited to attend.

## BROOKHAVEN BULLETIN

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