

The Spiderwort System: Small Plant Shows Promise In Certain Environmental Research

Brookhaven's "*Tradescantia* system" – recognized as potentially useful for the measurement of environmental mutagens – has been attracting a lot of attention during the past few months. Nuclear energy opponents in the U.S. and Japan have proposed using the *Tradescantia* plant, parts of which change color when exposed to a wide variety of mutagens, to monitor radiation levels around nuclear power reactors.

The *Tradescantia*, or spiderwort, is sensitive to many mutagens, including radiation. The plant is used in a promising Biology Department project in which a change in color of certain cells of the flower measures the effects of air pollutants. But Brookhaven experts caution that there are a number of difficulties involved in its use as a "people's radiation monitor."

The use of *Tradescantia* for monitoring power plant radiation levels is being promoted by Sadao Ichikawa, a Japanese scientist who was a postdoctoral fellow in BNL's Biology Department during the mid-1960's. Ichikawa has proposed that local citizens plant the spiderwort around commercial reactors, gather the flowers at intervals, and count the cells which have mutated from blue to pink. According to his supporters, increased numbers of mutations could indicate unhealthy levels of radiation.

Tradescantia is indeed likely to show an effect when exposed to fairly low doses of radiation, says Lab Associate Director Victor Bond. But he also warns that there are "a number of experimental difficulties and scientific reasons that virtually preclude its use" in detecting radiation around nuclear reactors.

Sensitive To Stresses

For one thing, the *Tradescantia* is sensitive to a wide variety of stresses – both physical and chemical. Its color genes will respond to radiation and to many different kinds of chemicals, as well as to changes in temperature, humidity and light. "If you blink at the plant, it's liable to mutate," says Bond.

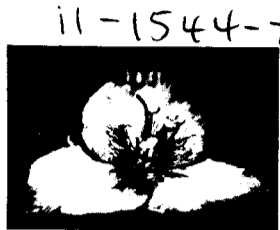
This sensitivity makes it essential that any research done with the plant be carried out under carefully controlled conditions. If it were planted near a highway, for instance, and an increased number of mutations were recorded, there would be no way of knowing whether they were due to radiation or to automobile exhaust fumes. When the plant is used for research at BNL, it is grown in specially designed growth chambers which provide controlled temperature, humidity, soil and atmosphere.

"Even with these careful controls," says Bond, "the *Tradescantia* must be exposed to at least 300 millirem for any reasonable expectation of observing a statistically valid response. Since the time over which the *Tradescantia* would accumulate these changes is limited to about three weeks, the annual dose at a nuclear plant location would have to be on the order of several thousand millirem – far exceeding the exposures permitted by the NRC guides."

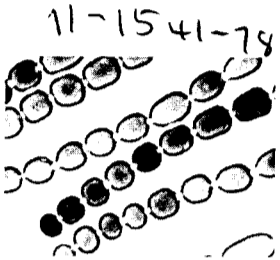
In addition, scientists cannot yet say whether the plant's response to radiation has any implication in human health hazard assessment. "There remain many unknowns about its genetics, which must be understood before it can be considered a reliable monitor of genetic hazards," says Lloyd Schairer of Biology, who worked with the plant for twenty years. Among those unknowns, he says, is whether the chemically or radiation-induced damage to the color genes is indeed permanent and transmitted sexually from one generation to the next.

System Is Useful

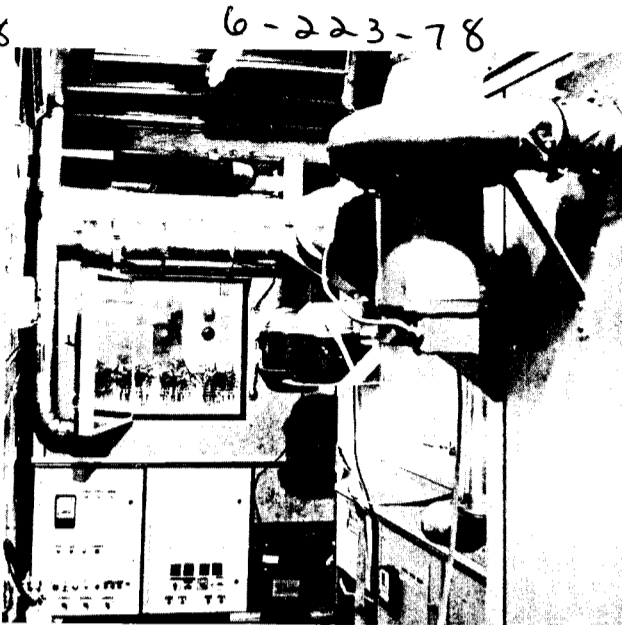
When used properly, however, the *Tradescantia* system is useful in research on environmental mutagens. The system was developed by the late radiobiologist Arnold Sparrow, who pioneered the use of *Tradescantia* clone 02 as the first major tool in somatic cell mutation studies. He and his staff began research with the plant in 1958, concentrating on the effects of radiation on the plant's cells. The system was later applied to research with chemical mutagens.



Enlargement of blue flower.



Stamen hairs magnified 40 times. The lighter areas show the mutated cells.



Interior of mobile monitoring van showing rear exposure chamber (with cuttings) and a control chamber.

One of the major advantages of the *Tradescantia* test system is that it combines sensitivity with convenience. Color changes occur frequently in response to low doses of mutagens, and the altered cells are easy for scientists to detect and count.

If immature buds are exposed to various stresses, mutations are likely to occur in the color genes of the buds' actively dividing petal and stamen hair cells. The *Tradescantia* clones used at BNL are heterozygous for flower color – that is, each cell has one gene for blue flower color and one for pink. Since the blue gene is dominant over the pink gene, normal unaffected plants will have blue flowers. Radiation or chemical mutagens can affect the gene function through a variety of mechanisms, including chromosome breaks or deletions and altered gene structure. Cells produced by an injured cell may express only their recessive pink gene and thus appear pink.

Mutations are observed in the flowers opening from one to two weeks after the young buds were exposed to the mutagen. The color change of a large mutant sector can be seen by the naked eye, but a microscope must be used to count the number of pink cells. Since hundreds of *Tradescantia* cells can be seen at a glance through a light microscope, scientists can get statistics on cell mutations very rapidly.

The plant's sensitivity and the relative ease of data-gathering has made the *Tradescantia* very useful in establishing an accurate "dose effect curve." This curve, fundamental to radiobiological theories, is plotted in graph form and shows what happens to an organism as a function of the dose of radiation. Dose effect curves for most biological systems require extrapolation at low doses – scientists must infer what the effects of a very low dose of radiation would be by plotting a curve based on the data obtained at higher doses. The *Tradescantia*'s unusual sensitivity, however, results in a much more accurate curve which is based on data actually obtained at low doses.

But the plant is still not sensitive enough, says Bond, to respond to the extremely low levels of radiation which might be found near nuclear power plants. Ichikawa has hypothesized that mutations will occur near power plants because of radionuclide discharge from reactor stacks. He suggests that the *Tradescantia* has the ability to concentrate radioactive iodine-131 in its cells, and that mutations might be due to exposure to the iodine-131 rather than to external radiation. Bond feels, however, that this explanation "makes no sense. There is no known mechanism for plants to concentrate iodine."

Air Pollution Studies

BNL researchers do feel that the *Tradescantia* has potential for use in detecting chemical mutagens – particularly those found in air pollution. During the last 2½ years, cuttings of the plant have been exposed to ambient air at locations all over the country, to assess the possible mutagenic effects of common pollutants. The work is funded by the National Institute of Environmental Health Sciences (NIEHS) and DOE.

For the field of studies, Biology Department researchers use a specially outfitted 24-foot trailer which can be pulled by a pickup truck. The trailer contains three environmentally controlled growth chambers, each of which can hold 300 *Tradescantia* cuttings, plus elaborate air filtering and control equipment. During use, one of the chambers is supplied with filtered air to serve as a control, one is connected to a four-inch glass intake duct which pulls in polluted air from the outside, and one

(continued on page 2)



A copper smelting plant, one of the sites monitored by BNL and EPA during field studies using the *Tradescantia* test system.

Tape Honored By AIF And ANS

AUI President Gerald F. Tape has been presented the Henry DeWolf Smyth Nuclear Statesman Award by the Atomic Industrial Forum and the American Nuclear Society. He received the gold medal award at a joint banquet of the two leading nuclear energy organizations on November 15 in Washington, D.C.

Named after Dr. Smyth, a pioneer nuclear scientist, policymaker and diplomat, the Nuclear Statesman Award was established in 1972 by the AIF and the ANS to recognize outstanding service in developing and guiding the uses of atomic energy in constructive channels. Dr. Tape was cited for his "reputation as a tireless worker for the policies and programs that would provide the benefits of atomic energy to all peoples of the world."

Besides his service to Brookhaven as deputy director from 1951 to 1962, and his leadership of AUI in the operation of the Laboratory and NRAO, Dr. Tape has held important national and international posts.

In 1963 he was nominated by President Kennedy to fill an unexpired term as a member of the U.S. Atomic Energy Commission, and was reappointed in 1966 by President Johnson. He resigned in 1969 to return to the presidency of AUI.

In June 1973, President Nixon appointed him as U.S. ambassador to the Interna-



Gerald F. Tape

tional Atomic Energy Agency, a special agency of the United Nations headquartered in Vienna, Austria. He served in this post until 1977, while continuing as president of AUI.

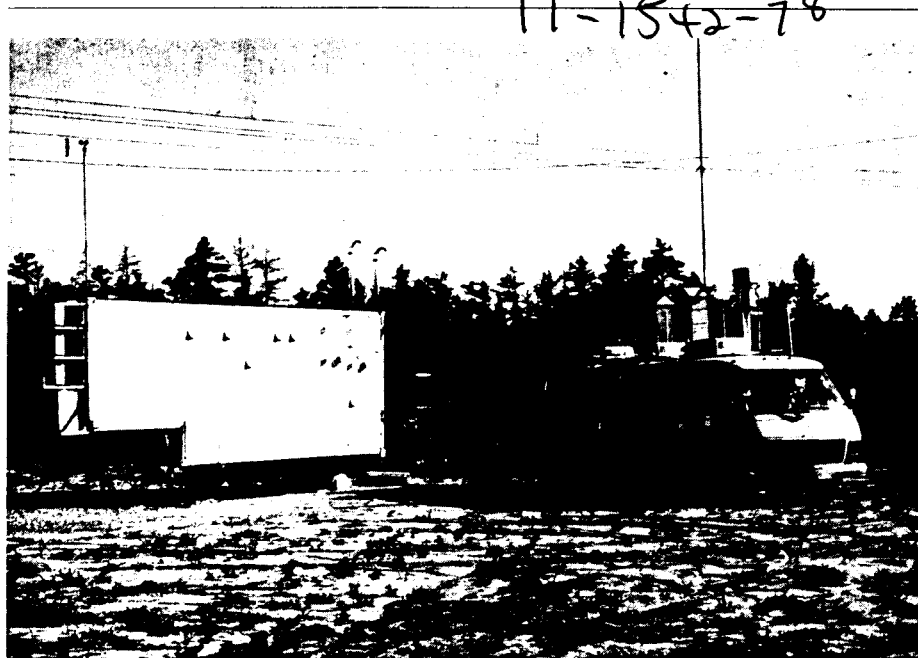
Other recipients of the Nuclear Statesman Award include Dr. Smyth, former Congressman Chet Hollifield and Sigvard Eklund, Director General of the International Atomic Energy Agency.

Free Concert

This year, the Music Department of the State University at Stony Brook inaugurated a series of chamber music concerts by three groups of outstanding graduate students in the music program. The three ensembles, a piano trio, a string quartet, and a wind quintet tour the metropolitan New York area and Long Island with their programs.

BERA is pleased to present graduate students, Arthur Greene, piano, Christopher Collins Lee, violin, and Pamela Frame, cello, on Friday, December 8 at 8:30 p.m. in Berkner Hall. The Graduate Student trio has been coached by members of the Beaux Arts Trio.

The program will include a trio in G major by Haydn, the Shostakovich Trio and the B major trio of Johannes Brahms. Admission is free and the public is invited.



BNL's mobile monitoring trailer and EPA's monitoring van on location during a test run.

Spiderwort

(Cont'd)

serves as a back-up unit in case either of the other two fails.

Much of the trailer's instrumentation and assembly was done by Neal Tempel, who also operates the vehicle, driving it to and from the field sites.

Special Hybrid Is Used

The plant used in the trailer is a special hybrid called clone 4430, developed by Marta Nawrocky. Clone 4430 is sensitive to radiation, like all its related species, but is much more sensitive than most to chemical mutagens.

Cuttings of the plant are hand-carried, by car or airplane, to the trailer and are exposed to ambient air pollution at each site. The exposed cuttings and the unexposed control plants are then brought back to the Lab. After the flowers bloom, the number of pink cells is counted, or "scored," by Richard Sautkulis, Eric Klug, Virginia Pond, and Nawrocky. Genetics work for the project is done by Nawrocky and Margaret Thompson.

For its first field trials, beginning in 1976, the Mobile Monitoring Vehicle was taken to Exit 13 of the New Jersey Turnpike, near the foot of the Goethals Bridge in Elizabeth, New Jersey. The cuttings were exposed to ambient air pollution for two weeks at a time, and scoring showed significant increases in mutation events.

Encouraged by the results, the group began a joint project with the EPA in May 1977. The trailer was set up at eight locations throughout the country where levels of air pollution are known to be high; at each site, an EPA monitoring van was also in operation to make physical measurements of the pollution levels. (A ninth site, near the edge of the Grand Canyon, was also included to serve as a control study of the plants' response to non-polluted air.)

Significant Increases Are Seen

Scoring showed significant increases in the mutation rates for plants exposed at several of the locations, with the largest increases (from 17% to 31% more mutations than the control group) obtained at sites associated with petroleum refining and mixed chemical processing.

Several other industrial locations, and the virtually pollution-free control site at the Grand Canyon, showed no significant difference between control and exposed plants. Schairer notes, however, that negative results at industrial sites are no guarantee that the pollution in these areas is not mutagenic, since wind direction, recent heavy rain, and industrial factory schedules can all temporarily affect the ambient air pollution levels.

The group is "elated" at the detection capabilities of the techniques so far, says Schairer, although he notes that much work remains, especially in the area of identifying and quantifying specific chemical mutagens.

If the *Tradescantia* plants show an increased number of mutations in response to ambient air, "then you know you may have a problem," Schairer says. "But just what that problem may be is more difficult to tell. There's little chance at this point that we can pinpoint a certain compound as being mutagenic. But if we can show that there is some mutagenicity in a particular gaseous atmosphere, that's a big step forward toward showing, at least in relative terms, how hazardous that atmosphere might be."

Suited To Pollution Work

The *Tradescantia* system appears to be well suited to air pollution work for several reasons. For one thing, it measures the actual biological effects of chemical mutagens on living organisms, whereas conventional monitoring systems measure only physical quantities of certain air pollutants.

In addition, conventional systems often ignore the possibility of synergistic interactions between pollutants, which might result in effects that are greater than the simple total of the individual effects. And while conventional air pollution surveillance systems measure the level of specific, identified pollutants, the *Tradescantia* system may reveal the presence of previously undetected pollutants by their effects on the plants.

A key factor making the *Tradescantia* system currently more useful for air pollution monitoring than for radiation measurement is the relative "state of the art" of dosimetry for the two mutagens, says Bond. Using currently available equipment, radiation can be detected and measured at extremely low doses and dose rates.

"For chemistry," he says, "it's a whole different ball game. It has not received the attention that radiation has, so the dosimetry for chemical pollution is absolutely embryonic. It's now at the point where radiation dosimetry was perhaps a half a century ago."

Bio-indicators such as *Tradescantia* may therefore be valuable tools in the study of air pollution - particularly while improved dosimeters are being developed, says Bond. As a means of measuring low level radiation, however, the plant appears to be far surpassed - in accuracy, speed and reliability - by available conventional instrumentation.

Emergency Closings

The following radio stations will carry notification of BNL delayed openings and emergency closings:

| Station | Area | AM | FM |
|---------|-------------|------|-------|
| WBAB | Babylon | 1440 | 102.3 |
| WGLI | Babylon | 1290 | - |
| WLIX | East Islip | 540 | - |
| WHLI | Hempstead | 1100 | 98.3 |
| WGSM | Huntington | 740 | - |
| WALK | Patchogue | 1370 | 97.5 |
| WBLI | Patchogue | - | 106.1 |
| WRIV | Riverhead | 1390 | - |
| WRCN | Riverhead | - | 103.9 |
| WLNG | Sag Harbor | 1600 | - |
| WWRJ | Southampton | - | 95.3 |

New York Train Trip

The Hospitality Committee is planning a group railroad trip to the city on Wednesday, December 20. Departure will be at 8:28 a.m. from the Patchogue LIRR station. Round-trip fare for adults is \$2.45, children under six years ride free.

Reserve a ticket by sending your fare through the U.S. mail to P.O. Box 322, Upton, New York, no later than Thursday, December 14. Make checks payable to Brookhaven National Laboratory. Your tickets will be given to you at the train station. Refunds will be made only if cancellations are received by Friday, December 15.

Energizing Quiz

The following true-false quiz for the energy conscious contains some facts and tips which you might find useful for saving energy in your own home. Take a moment to see how many of the answers you know "cold" - then, check your answers to those below suggested by the DOE.

- More than: a) 39% b) 16% or c) 25% of all electricity consumed in America is used for lighting.
- Always (OR) never turn three-way bulbs to the lowest lighting level when watching television.
- You can get about the same amount of light from a 50-watt reflector floodlight as from a 100-watt bulb.
- One advantage of using fluorescent lighting is that it will deliver approximately a) 2, b) 4, or c) 5 times more lumens than an incandescent bulb of comparable wattage.
- A recommended way to reduce overall lighting in your home is to replace one incandescent bulb of three in multiple light fixtures with a burned-out bulb.
- Burning several small bulbs in one fixture rather than one large bulb can represent substantial energy savings.
- An aerator in your kitchen sink faucet reduces flow and thereby wastes energy.
- When the pilot light of your gas stove burns blue, it's burning inefficiently and should be adjusted.
- If every dishwasher in the country was operated less - by just one load per week - almost 15 million kilowatt-hours of electricity could be saved every day. That's the equivalent of saving a) 2,000, b) 9,000, or c) 13,000 barrels of oil daily.

(Taken from "Tips for Energy Savers." Single copies available from: Tips for Energy Savers, Energy Conservation Now, Pueblo, Colorado, 81009.)

(Answers on page 4)

1979 Bumper Stickers

Automobile registration forms for 1979 bumper stickers are being distributed to all departments by the Police Group this week. Employees are reminded to include their building number on the lower right hand corner of the form, and return the completed form as soon as possible to Police HQ, Bldg. 050.

Stony Brook Events

Friday, December 1

Opera: "The Marriage of Figaro" (English), 8 p.m., Dec. 1, 2, and 8; 2 p.m., Dec. 9; Main Auditorium, Fine Arts Center. Tickets: \$4 general public. Call 246-5678 for more information.

Saturday, December 2

Concert: Paul Winter (benefit performance for Campus ENACT), 9 p.m., Gym. Call Student Activities Board at 246-7085 for ticket information.

Sunday, December 3

Recital: Harpsichordist Peter Wolf, 5 p.m., Sunwood Estate, Old Field. Admission: \$5.50 general public. Call 246-5678 for more information.

Concert: Stony Brook Gospel Choir, with guest performance by the Mt. Vernon Community Choir, 6 p.m., Stony Brook Union Auditorium. Admission, \$1. For further information, call 246-3867.

Tuesday, December 5

Experimental Theatre: "Such Tunes as Killed the Cow," 8:30 p.m., 114 South Campus B. Donations. Call 246-5678 for further information.

Recital: Pianist Rudolph Serkin, 8 p.m., Main Auditorium, Fine Arts Center. Tickets: \$10, \$8 and \$6. For more information, call 246-5678.

Wednesday, December 6

Speaker: Dr. Lenore Blum, Mills College, San Francisco, 1 p.m., "San Francisco Bay Area Programs for Women in Science," Room 4-125, Math Tower; and at 4 p.m., "Women in Science Network," Behavioral and Social Sciences Building, Second Floor Lobby. Films and refreshments. Part of the "Women in Science Get-Togethers." Call 246-6785 for further information.

Recital: The Rogeri Trio, 8 p.m., Main Auditorium, Fine Arts Center. General public, \$7. Call 246-5678 for more information.

P. Gerald Kruger Dies

Prof. P. Gerald Kruger, one of the pioneers of accelerator development, died in Champaign, Illinois on November 4. He was closely associated with the accelerator program at BNL until 1970 when he suffered a severe stroke. An early advocate of superconducting accelerator magnets, he was the organizer of the magnet development group which eventually grew into the ISABELLE project. Kruger had been on the physics faculty of the University of Illinois since 1931 and built the world's second cyclotron in 1935. One of his first graduate students was the late G. Kenneth Green, long time chairman of BNL's Accelerator Department.

Safeguards Seminar

A lecture entitled "The Future Role of the International Atomic Agency (IAEA) in Non-Proliferation" will be delivered by A.M. Labowitz, currently with the Office of Ocean, International Environmental and Scientific Affairs, Department of State.

He will speak Monday, December 4 at 3:00 p.m., in the Hamilton Seminar Room, Chemistry.

Mr. Labowitz, who holds degrees in Chemical Engineering and Economics, has been involved with problems relating to atomic energy dating back to the Manhattan Project. He was associated with the Atomic Energy Commission for several years including a seven-year period as Special Assistant on Disarmament to the Commissioners. From 1961 to 1963, Labowitz was attached to the U.S. Mission to the European Community, Brussels. Since 1970, Labowitz has served as Counsellor to the U.S. Mission to the IAEA, Vienna.

Service Awards 11-300-78



Medical Department service awards were presented to William H. Maston (left) - 10 years and Powell Richards - 30 years, by Deputy Chairman Robert B. Aronson.

-photo by Reben

Pool Schedule

This is a reminder to all employees that the swimming pool will be closed for maintenance from Monday, December 4 through Monday, January 1.

On re-opening day, January 2, the following schedule will be in effect:

Weekdays

11:00 a.m. to 1:30 p.m.

Employees Only

5:00 to 9:30 p.m.

Employees/Family Members/Guests*

Weekends

1:00 to 6:00 p.m.

Employees/Family Members/Guests*

New season tickets for the period January 2 through April 30, will be sold at the pool starting on re-opening day.

Season ticket prices:

\$15 Individual

\$25 Family

Daily admissions:

\$1 Employee/Family Member

\$1.50 Guest*

*One guest per employee is permitted at the pool. Advance arrangement for additional guests (but not more than five at any one time) may be made at the Recreation Office. Employees will be responsible for the conduct of their guests.

Correction

The Bulletin notes the following correction in its story of November 17 concerning the dollar value of U.S. Savings Bonds purchased by BNL employees. The 1977 figure should read \$240,000 and the 1978 value is \$360,000.

11-1473-78

11-1455-78

BROOKHAVEN BULLETIN

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Craft Art Fashion Show At Center



A handmade floor-length vest and sterling and gold wash cuff with a combined value of over \$400 were modelled by Inge Kirk in the afternoon show presented by the Hospitality Committee. Inge is the wife of Harold Kirk, Physics.



Modelling knit hats and a vest at the November 16 "Autumn Get-Together" is Claudia Meyer, wife of Geerd-Jurgen Meyer, Chemistry. Hand-crafted "wearable art" from a collection at the Gallery North, Setauket was featured in an unusual and colorful showing.

Decorate Page One

For the front page of its December 22 issue, the *Bulletin* asks BNL amateur photographers to submit black and white prints of holiday or winter scenes. Photos should not be over 8½" by 11" and must be submitted to the *Bulletin* office, Building 460, no later than noon, Friday, December 15. Photos need not be current for 1978.

Advice On Adverts

Page four of the *Bulletin* has long been reserved for the classified advertisements of BNL employees. This free service is extremely popular and *Bulletin* ads do bring results. However, there are those who abuse the service by assuming that the ad policy, which appears on every form, applies to someone else.

The classifieds are for the use of active or retired BNL employees, and for those holding some form of guest appointment to the Laboratory. Your second cousin's brother-in-law may not rent his apartment using your life number on his ad, and you may not use your name, number and extension to sell your neighbor's '64 Rambler. The items offered for sale must belong to the person selling them.

Employees are reminded that they may submit only one ad each week. If you have several items in different categories to be advertised, please choose one and submit the others in subsequent weeks.

Normally, ads submitted by noon, Monday, will appear in that Friday's edition. If an ad doesn't appear, it was either completed improperly, or the number of ads exceeded the space available. If employees follow the rules, there is a much greater chance that ads will appear on schedule and not be delayed for several weeks because too many ads are being submitted for non-employees.



As these guests at the Hospitality Committee's autumn fashion show prove, colorful attire was not only to be seen on the models. —photos by Reben

Hospitality Committee

A morning coffee will be held on Monday, December 4, from 9:30 to 11:30 a.m., in the Brookhaven Center.

Please come and bring the children. Babysitting will be provided at no charge. It is suggested that you bring along a toy or two for your children to play with.

Volleyball

Standings

Mixed League

Division A

| | |
|---------------|--------|
| Oceanography | 12 - 0 |
| No Names | 10 - 2 |
| Nuclods | 7 - 5 |
| Family Affair | 6 - 6 |
| Nuts & Bolts | 6 - 6 |
| Diamonds | 4 - 8 |
| Lookin' Good | 4 - 8 |
| Popovers | 2 - 10 |

Division B

| | |
|-----------------|--------|
| Leftovers | 10 - 2 |
| Balls & Strikes | 9 - 3 |
| Nads | 8 - 4 |
| Wisa's | 5 - 7 |
| Medical | 4 - 8 |
| LeMufs | 0 - 12 |

Employees' League

| | |
|--------------|-------|
| Spikers | 9 - 0 |
| Bumps | 8 - 1 |
| Toga | 5 - 4 |
| Atom Spikers | 2 - 7 |
| Cool Tools | 2 - 7 |
| Phoenix | 1 - 8 |

Sing For Christmas

The BNL Christmas Chorus invites singers to join their rehearsals of traditional carols at noon, December 4, 11 and 18 in Berkner Hall. Join us!

Cafeteria Menu

Week Ending December 8, 1978

| | |
|---|-----------------------------------|
| Monday, December 4 | |
| Tomato vegetable soup | (cup) .30 (bowl) .40 |
| Vegetarian omelette | 1.25 |
| Grilled ham steak & 1 veg. | 1.40 |
| Hot Deli - Pastrami | (on bread) 1.15 (on roll) 1.25 |
| Tuesday, December 5 | |
| Cream of potato leek soup | (cup) .30 (bowl) .40 |
| Vienna loaf and hash browns | 1.30 |
| Macaroni and cheese & 1 veg. | 1.15 |
| Hot Deli - Corned beef | (on bread) 1.25 (on roll) 1.35 |
| Wednesday, December 6 | |
| Pepperpot soup w/spaetzles | (cup) .40 (bowl) .50 |
| Tuna noodle casserole | 1.25 |
| Southern fried chicken w/corn fritters | 1.35 |
| Hot Deli - Veal and peppers hero | 1.25 |
| Thursday, December 7 | |
| Chicken noodle soup | (cup) .30 (bowl) .40 |
| Marinated pork steak & 1 veg. | 1.40 |
| Salisbury steak & 1 veg. | 1.25 |
| Hot Deli - Smoked turkey breast | (on bread) 1.25 (on roll) 1.35 |
| Friday, December 8 | |
| Manhattan clam chowder | (cup) .40 (bowl) .50 |
| Fresh broiled filet of cod & 1 veg. | 1.35 |
| Roast sirloin of beef w/oven roasted potato | 1.45 |
| Chili bean hero | 1.25 |

Arrivals & Departures

Arrivals

| | |
|--------------------------|---------------------|
| Edward J. Grove | Accelerator |
| Robert A. Boie | Instrumentation |
| Kenneth S. Czyscinski | Nuclear Energy |
| Cheryl A. Namy | Biology |
| Maurizio Ribera d'Alcala | Energy and Env. |
| Yoshiki Teramoto | Physics |
| James M. Wolkiewicz | Adm. Sys. & Data P. |

Departures

| | |
|-----------------|---------------|
| Tse-Lok Ho | Medical |
| Calvin Lam | Accelerator |
| Robert Nathans | Energy & Env. |
| Joseph J. Vidal | Physics |

Kayaking

The Mountain Club will sponsor a kayaking open house at the Lab pool on Sunday, December 3 from 10:30 a.m. to 1 p.m. Bring a bathing suit and try your hand at manipulating a kayak. Those interested in taking kayaking lessons may sign up on Sunday, or, if unable to attend, may contact Dick Watson on Ext. 3788.

Duplicate Bridge

The first meeting of the Duplicate Bridge club will take place on Thursday, December 7 at 5:30 p.m. at the Brookhaven Center. We already have responses from 24 people. This meeting will evaluate the needs of the people and their interests. Informal game is planned. If you are interested in playing Duplicate Bridge, please contact Bharat Bhatt at Ext. 2966 or Colin Durston at Ext. 2598.

Bowling

Red League

A great team effort by the Old Timers gave them an 11-0 win over the Trouble Shooters. They shot high series for the year, knocking down 3174 pins. W. Reams led with a 626-692 series including a 235 game. H. Frei had a 246, 583-676 series, and R. Adams a 213 with a 573-621 series.

The Freon Loaders took 8 from the Dyno-Mites. The Designers also won 8 in a match with the Anachems. E. Gill had a 212. The Sparks shut-out This Isa Team 11-0. E. Sperry, Jr. bowled 209.

In a match, plagued by 37 splits, the Sandbaggers managed a 7-4 win over the 76'ers. E. Meier bowled 210, C. Bohnenblusch 201 and J. Connelly 213.

Pink League

Ellie Kristiansen's 189 game and 490 triple gives her a 155 average which is 15 points over last year's average. Also having a good season is Renie Rosati who had a 187 game and 487 triple bringing her average up to 152, 13 points over last year.

High games were bowled by Helen Keeley 197, Marge Stoeckel 195 and Audrey Blake 182.

Purple & White League

The men outdid themselves this week with many 200 games and high series. Dave Penoyar rolled a 222/194 for a 595 series, Ed Sperry 202/216 - 586 series, Ken Asselta 216/201 - 585 series, Bob Jones 214/191 - 569 series and Jim Petro 208 - 565 series. Nate Carter 229, Dick Murgatroyd 210, Jim Griffin 206, Geri Riker 170, Carolyn Eterno 167, Kathy Griffin 166 all bowled good games.

The Good Times and The Flounders are tied for first place; the Pen Mac's and Draftecs are right behind.

Green League

The Sparks, who have been steadily rolling along, finally got dumped as the Pinball Wizards took them for eight from the Old Timers II, with S. Carrier having a 208. The Blue Jays took eight from the Anachems. The Dyno-Mites downed the Designers by taking seven while the Cosmos only took three. Only one turkey was awarded to the men's leagues and it was won by Bob Jones.

1979 BNL Holidays

| | | |
|------------------------|-----------|---------------------|
| New Year's Day | Monday | January 1 |
| Washington's Birthday | Monday | February 19 |
| Memorial Day | Monday | May 28 |
| Independence Day | Wednesday | July 4 |
| Labor Day | Monday | September 3 |
| Floating Holiday | Tuesday | September 4 |
| Veterans' Day | Monday | November 12 |
| Thanksgiving Day | Thursday | November 22 |
| Day after Thanksgiving | Friday | November 23 |
| Floating Holiday | Friday | December 21 (½ day) |
| Christmas Eve | Monday | December 24 |
| Christmas Day | Tuesday | December 25 |

(As indicated above, the two floating holidays are Tuesday, September 4, a half-day on Friday, December 21, and the morning of Christmas Eve, Monday, December 24. As the afternoon of December 24 is a regular holiday, the ½ day floating holiday was added to give a full day off.)

Miscellaneous

SEWING MACHINE - Singer straight stitch, good cond, port w/case, \$50. Jerry, 475-5591 before 3.

DOG - pedigree border collie needs home. Harold Abilock, Ext. 2865.

TRAINS - N-gauge and layout, many extras. 473-7797 after 6.

PAINT - 6 gal grey deckpaint & white cement point, \$2/gal. Dan, Ext. 3145.

BABY CARRIAGE - like new, Scandinavian make, cocoa, can be folded & used as car bed, \$40. Joan, 589-5798.

LEVEL - engineer's, \$55; balloon theodolite, \$150; tripods, \$30 each. Ext. 4058 or 286-0436.

GAS BOTTLE - 100 lb LP gas bottle, best offer. Pete, Ext. 3297 or 821-9547.

TV ANTENNA - lg dbl room, log periodic, uhf, vhf, fringe area beam, \$15. Chuck, Ext. 4331 or 4305.

GAS GENERATOR - 11x11 bungalow tent, humidifier & dehumidifier. 363-6341.

BALL HOPPER - holds 60 balls, deluxe model, never used. Ext. 3514.

TYPEWRITER - Remington Electric, office model, carbon tape or ribbon, very good cond, asking \$125. Ext. 4058 or 286-0436.

REFRIGERATOR - Westinghouse 11 cu ft, old but in good cond, \$20. 732-7134.

BIKE - 16" wheels, 15" frame w/training wheels, for child learning to ride, good condition, \$10. Lew, Ext. 3618 or 281-7547.

STENO MACHINE - w/tripod, reporters model, excel cond, ribbons, ink & cleaning kit included; high speed dictation tapes, \$3 each. Ext. 3620.

GUITAR - 1969 Hagstrom solid body elec 12 string guitar, excel cond w/case & cord, \$150; Kimberly elec 6 string guitar, excel cond, good for beginner, \$75. 475-5789 after 6.

LIVING ROOM SET - 7 piece matching Herculon fabric, 3 cushion couch, 2 cushion couch, armchair/ottoman, hexagon end table, square end table, coffee table. Joe, Ext. 4204, 588-3146.

SKIS - 205 cm Hart Camaro giant slalom w/cober bindings mounted. \$60. George, Ext. 2296.

BEDROOM SET - double bed w/mattress & box spring, 2 nite tables, 2 dressers & mirrors, \$100. George, Ext. 4460.

BED - Eclipse hi-riser, opens to queen size, new cond, \$110. Ext. 7985 or 727-7796.

SNOW PLOW - garden walking tractor, National 4.3 hp, 36" sickle bar, disc harrow, garden plow, cultivator. 584-5919.

BEAGLE - AKC registered, 2 yrs old, male with champion lines from Charleston, S.C., has all shots. \$75. 924-6415.

BASS GUITAR - Univox, great sound, in mint cond, new roto sound strings, \$200. 475-1844 after 6.

FIREPLACE SCREEN - w/andirons, \$10; club chair, excel cond, \$10. Jack, Ext. 2907.

PRESSURE COOKER/CANNER - Sears, used 4 times, instructions incl. \$35. Joe, Ext. 2251.

WINTER COAT - full length rabbit coat, never worn, size 10, \$50. Pat, Ext. 4591 or 665-9242.

FUR JACKET - custom make genuine natural ranch mink in very good cond, size 10-12, appraisal in writing at \$800, will sell for \$400. Ext. 4721 or 273-5574 after 5:30.

POOL TABLE - wood top, \$65; 1 oak coffee table, (2) oak step tables, \$20. 924-3522 after 5:30.

SASH & FRAMES - (4) alum dbl hung for masonry walls, 37¼" w x 41" h, can be adapted to wood frame structure, \$15 each or 4/\$55. Pat, Ext. 4519.

GIFTS - for men-stocking stuffers, can't find the gift for him? I have it, gifts for tots, none over \$5. Doris, Ext. 3488 or 924-7832 after 5.

WOK - Westbend elec, new, \$15. 727-1617.

FREE - 15-20' live Christmas tree to any religious, charitable, fraternal organization or fire dept. Will cut down first week in Dec. 281-8943 or Ext. 3284.

MINI BIKE FRAME - blk & yellow, front & back shocks, excel cond, \$30; helmet, small, blue, excel cond, \$10. Jim, 588-0677.

HI FI SPEAKERS - Bose 501/Series I, freestanding, \$250 pr or best offer. Mark, 345-2862, Room 5.

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

SHOREHAM VILLAGE - Lg Clarendon custom Colonial, 4 br, 2½ baths, den w/fp, eik, formal D/R, 1¼ wooded acre, deck, walk to tennis, beach, country clubs, \$80,000 reduced. 744-1935.

EAST PATCHOGUE - 10 rm Colonial, beautifully landscaped, rock garden, gazebo, 1.4 acres, horse country, 4 br, 30' L/R, fp, formal D/R, laundry rm off kit, 2 garages, full bsmt, low 60's. 475-0168.

SHIRLEY - 3 br ranch, L/R, D/R, den w/fp, W/W, fin bsmt w/bath (poss mother-daughter), ½ acre landscaped, 5 appl, fenced-in veg garden. \$33,500. Call Ext. 3689 or 281-8016 eves.

ROCKY POINT - 4 br Colonial, pool, fenced yard, carpeting, all appl, wood-burning stove and ½ acre land. \$52,000. 744-0996.

MATTITUCK - secluded 3 bdrm, 2 bath ranch in priv wooded area w/deeded beach rights, w/w carpeting, draperies, appl, fam rm w/fp, low taxes. Ext. 3559 or 298-4592 for appointment.

BELLPORT - 3 bdrm ranch, 3½ yrs old, eik, L/R, 28' playroom, oil b.b. heat, mudroom w/washer & dryer, 185' deep property on quiet block. \$35,000. 286-8789.

CALVERTON - 3 bdrm ranch, oil fired heat & water, storms & screens, fin bsmt with bathrm & kitchen, 1 acre property. \$34,000. 727-9058.

BOHEMIA - mobile home, 12'x60', 2 bdrms, w/w carpeting, 4 appl, tool shed, fenced patio, 50x100' plot, quiet family park, \$15,000. 589-7067 after 5.

SHOREHAM - 4 bdrm colonial, w/w carpeting, s.s., fenced, many extras, low taxes. \$56,500. 744-2821.

HEAD-OF-THE-HARBOR (St James) - custom farm ranch, 1 mi from beach, 6 B/R, 5 baths, 3 f.p., 2 + acres heavily wooded, all appliances. Must sell, price negotiable. 584-6058 or 981-1327.

MASTIC BEACH - 2 br ranch, lg den/dining, paneled deck, 120x100 corner lot, S/S, full bsmt, low taxes, treed, new kit, storage shed. \$25,500. 281-7763.

EAST MORICHES - ½ acre, 3 br ranch, 1½ baths, L/R, D/R, kit, full bsmt, hot water heat, att garage, fenced back yard. Call 878-9192 after 5.

EAST PATCHOGUE - must sell, 3½ yr custom built 9 rm wide ranch, prime area, 4/5 bdrms, 2½ baths, hugh eik, D/R, 2 dens, 2 garages, appl, carpeting, beautifully landscaped. 289-0443.

MASTIC BEACH - long line ranch, 2 over-sized br, cabinet lined kitchen, formal D/R, den, full bsmt, baseboard heat, ¼ acre. \$27,995. 281-5498.

PORT JEFF STATION - Lge, beautiful 4 bdrm house, wooded ½ acre, 3 baths, w/w, lge fam rm, 2 car garage, fenced, poss. M/D home owner. Ext. 3431.

BROOKHAVEN HAMLET - 3 br ranch, attached garage, lg, fin bsmt, bar, 2 fp, screened porch, appl, extra insulation on beautifully landscaped .83 acre near bay. (212) 831-6157 after 6.

SHOREHAM - Custom built Colonial, 4 br, L/R, D/R, eik, fp, w/w carpeting, SS, 2 car garage, full bsmt, 1 acre fenced, landscaped. \$56,500. 744-2821.

RIDGE - house on secl wooded acre +, 3 br, 2 baths, country kit, full D/R, L/R, in-ground pool. Principals only, low \$60's, bike to Lab. 924-4905 after 6.

SHOREHAM - Colonial, 4 br, fam rm, fp, 2½ baths, hardwood floors, D/R, eik, full bsmt, 2 car garage, appl, close to school, quiet court. \$57,000. 821-9365.

ROCKY POINT - Contemp ranch, 4 br, 3 baths, eik, D/R, 2 car garage, den w/fp, carpeting, bsmt, air, 3 zone oil heat, winter water view, ½ acre, low taxes. \$60,000, negot. 744-7532.

N. PATCHOGUE - 7 rm, 4 bdrm cape, 1 acre, fp, sun porch, indoor rock garden/waterfall, 2 car garage, pool, walking distance to school & shopping. Mid 50's. 286-1285.

For Rent

BROOKHAVEN - lge studio rm, semi-furn, \$225/mo incl util. Suitable for 1 or 2, quiet location. 286-1264.

MASTIC BEACH - 3/4 bdrm house, 160x100 prop, lg kit & L/R, formal D/R, entire inside just painted, shed, patio, porch, walk to store, beach. \$265/mo. Sec. Negot. Terry, 281-0360.

PATCHOGUE VILLAGE - 1 br house, couple preferred, \$225/mo. 286-8713.

MILLER PLACE - Mt. Sinai hbr view, secl, 3 br contemp. Lge L/R, D/R, furn or not, appl, avail Jan, '79. \$375/mo plus util. 928-6155.

RIDGE - Townhouse, 2 bdrm ranch, central air, w/w carpeting w/4 appl. \$325 mo. 924-6237.

Wanted

BABYSITTER - to care for 3 yr old boy, 5 days per week, 8:30 am to 5 pm, (\$7/day), Dec. only. On-site resident preferred. Maly, 345-3098.

HOUSECLEANER - located 5 mins. from Lab, preferably Saturdays. Ext. 3838.

LEROY - pens and templates. Jim Hallock, 878-0222.

SNOW SHOES - boots, snow suits, winter jackets for 4 and 7 yr old children; Elec iron, laundry basket, chopping board. Maggie, Ext. 3089.

ORGAN - reasonably priced for beginner. 653-4195.

UTILITY TRAILER - small, good cond. 281-7844.

HOME - for 2 kittens, 1 grey, tan, 1 black w/white chest. Free. 744-2821.

ROOMMATE - to share house in Bellport. \$175/mo, incl util. Ext. 3583 or 286-9725 eves.

HOME - for shepherd, collie mix. 2 yrs old, altered male, good w/children, excel watchdog. Must find home. Sue Munro, Ext. 2913.

HOME - for good natured Beagle, tan w/b&w, house broken, good watch dog. Palais, Ext. 2913.

OSCILLOSCOPE - good cond. John, 878-8874 any-time.

SHOP MANUAL - for '73 pick-up Chevy. Tom, Ext. 2959.

SPARE TIRE - and jack for '70 Vega. Ed, 277-5851 after 7.

RANGE/OVEN - Elec, 220 volts. Bill Stars, Ext. 4278.

ROOMMATE - to share 12 rm house w/3 other Lab personnel in Rocky Point. 5 br, fp, nr beach, 15 min from Lab, \$100 plus util. 821-1296 after 6.

METRANOME - drum set for student; portable elec typewriter. Bill, Ext. 4662 or 298-4089.

CAP - for pick-up truck, 8' bed. R. Skelton, Ext. 2005.

BABYSITTER - Jamesport-Aquebogue area for 16 mo old boy, to join play-group, 8:30 am to 4:30 pm, 2-3 days per wk. Top wages for dependable, quality care. Ref. required. Ext. 2948, 3051 or 722-3148.

HOME - for 2 yr old mixed Lab before Christmas. Loves children. Sharon, Ext. 3793 or 878-2591 eves.

SNOW PLOW - for Jeep. Call 286-9177 weekends.

POWDER SCALE - to weigh grains for shot shell reloading. Sheldon, Ext. 2043.

DOOR - half glass, half wood, 36" wide, standard height. Peter, Ext. 2540 or 744-5448.

MUSICAL TAX DEDUCTION - Bellport area group seeking used but sound/repairable musical insts for use in schools. Donation of insts are tax ded. Stewart, 286-9616.

FOLDING BED - reasonable. Marjorie, Ext. 3396.

PORTUGUESE LESSONS - (Brazilian), no teaching experience necessary, will bring textbooks. 281-7560 evenings.

ENCYCLOPEDIAS - set of World Book encyclopedias, pool table & ping pong table. Gene, Ext. 2416 or 265-5218.

WHEEL COVER - (4) original Datsun 240-Z wheel covers, perfect cond + any other Z parts. Scott, Ext. 4364 or 878-1777.

HOME - for two kittens, 1 grey & tan and 1 blk w/ white chest. Joann, 744-2821.

HOME - for multicolored female kitten. Alina, 281-7547.

CENTURA WARE CHINA - Summer Hill Pattern, any pieces. Ext. 3482.

Car Pools

RIVERHEAD - 1 or 2 drivers needed to complete existing 3 member car pool. Pat, Ext. 4519.

JAMESPORT-AQUEBOGUE - need car pool to Lab. Willing to do my share of driving. Andy, Ext. 2948 or 3051.

MASSAPEQUA - persons to meet exit 29 or 30 on SS Parkway or Massapequa area. Frank, Ext. 3898.

SOUTHAMPTON - would like to start or join a BNL car pool. Will drive own car for share of driving. John, Ext. 2070.

Lost & Found

FOUND - Hewlett Packard data cartridge, found on Johns Hopkins Street. Kathy, Ext. 3290.

Services

NURSES AIDE - certified, will work Pt. Jeff, Miller Place, Sound Beach, Rocky Point. 744-3968 after 12 noon.

LIGHT HAULING - trucking, messenger service, moving. Reasonable rates and insured. 727-5912.

TV REPAIR - free estimate on all carry in's. Frank DiCrescio. Ext. 4597 lunchtime or 399-1803 evenings.

NEW & USED TIRES - rims, repairs, mag wheel service, reg, radial, Dunlop-Gillette, free instal, balance avail. Fred Usack, Ext. 4597 lunchtime or 475-4935 eves.

FIREWOOD - upstate hardwood 4'x8'x18" split & delivered locally, \$50; pick up \$45. 399-3965.

PAINTING - professional, ext & int & wallpapering. Al, 878-9576.

BABYSITTER - responsible teenager who enjoys children. Bellport/Brookhaven/E. Patchogue area. Jennifer, 286-1022.

TREE REMOVAL - trees safely removed. I keep wood, no fee. Chris, Ext. 4612 or 281-7379 for appointment.

Classified Ad Policy

Deadline is 12 noon Monday for publication Friday of the same 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"/> Wanted | Check <input checked="checked" type="checkbox"/> the heading applying to your ad. Print or type your ad in 20 words or less. |
| <input type="checkbox"/> For Sale: Boats & Marine Supplies | <input type="checkbox"/> Carpools | |
| <input type="checkbox"/> For Sale: Miscellaneous | <input type="checkbox"/> Lost & Found | |
| | <input type="checkbox"/> Services | |

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

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

(Name & Phone No. To Call)

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