

the Bulletin Board

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IONIZING RADIATIONS AND PLANTS



FLUTE-PIANO CONCERT MONDAY, DECEMBER 11

Jean-Pierre Rampal — Flute
Robert Veyron-LaCroix — Piano

The third concert of the 1961-62 BERA Concert Series will take place on Monday evening, December 11, at 8:30 p.m., at the Brookhaven Center.

The outstanding Rampal/Veyron-La Croix duo will be heard in a program of works by Couperin, Poulenc, Hindemith, Bach and Beethoven. The New York Times of Friday, December 1, carried a most enthusiastic review of the duo's New York performance last week.

With two more concerts remaining, season's tickets at \$7.50 are still a bargain this time! Single admission is \$3.00 for adults, \$0.75 for children.

BNL VISITORS

Representatives of two engineer organizations will tour the Lab this week. Today, December 5, about 30 members of the Instrumentation Division of the American Institute of Electrical Engineers will be shown the Lab. On Wednesday, December 6, members of the American Institute of Chemical Engineers will be on site.

Left: A normal plant cell showing chromosomes divided into two groups is pictured on the left of the plate. On the right, the same type of cell after x-ray exposure is shown. Fragments and bridges between groups are typical abnormalities induced by any ionizing radiation. Above: Mutation from red to white induced in a snapdragon flower after chronic irradiation.

Since the end of the Second World War, the use of ionizing radiations in biological research has increased enormously. Because of its wide variety of sources of ionizing radiations BNL has become a center for biological research using such radiations as a tool. There is an extensive program of animal research, but this report will deal only with the plant life program. The effects of ionizing radiations on plants have produced changes in the structures of the plants as well as in their growth processes. Certain changes that can be inherited (mutations) are also produced by ionizing radiations and may be economically beneficial.

As the name indicates, ionizing radiations produce ionization (the process by which atoms are split into positive and negative parts, or ions) when they are absorbed in material. In living cells, many subtle chemical changes ensue and these may injure or kill first individual cells and ultimately the whole plant. Or they may bring about alterations in the genetic structure (chromosomes and genes) of the plant that may cause one or more of its progeny to have characteristics (size, shape, color, vigor, etc.) that differ from those usually found in the progeny from a non-irradiated plant or seed. Chromosomal damage is also considered to be responsible for the reduced growth or lethal effects of exposure to ionizing radiation.

Several different types of ionizing radiation are used in the plant life research program. Two of the most widely used are x-rays and gamma rays. Other radiations are sometimes classified as particulate, because they consist of subatomic particles such as protons, neutrons, helium nuclei and electrons (or alpha and beta particles). Reactors and accelerators such as the Cosmotron and the 60-inch cyclotron can be used for experiments involving these radia-

(Continued on following page)

IONIZING RADIATIONS AND PLANTS — Cont'd.

tions. The Biology Department has an x-ray machine and several gamma sources. The two largest gamma sources are outdoor facilities: the Gamma Field (or Gamma Garden) and the newly installed Ecology Field (or Gamma Forest). The former now has a Cobalt-60 source of about 3,000 curies; the Ecology Field has a Cesium-137 source of about 10,000 curies. Both fields are located in the eastern portion of the Lab site and will be subjects of future BULLETIN BOARD articles. When greater control of growing conditions is required, smaller sources are used in an adequately shielded laboratory or greenhouse where plants may be exposed to continuous radiation during summer or winter. These sources range from 1 to 130 curies of Cobalt-60.

Different species of plants may vary as much as 500-fold in their radiation tolerance. For example, a local native pitch pine or common garden lily would be killed or seriously damaged by several months' exposure to a gamma dose rate of from 10 to 20 roentgens (units of ionization) per day (r/d). On the other hand, a gladiolus would require 5,000 to 6,000 r/d for the same effect. Factors influencing such differences in sensitivity include nuclear volume and chromosome number (large nuclear volume and low chromosome number yield greater sensitivity), vigor and rate of growth, concentration of protective chemical substances within the plant, oxygen tension at the time of exposure, and exposure time.

Many observed over-all radiation effects have become subjects for further studies of specific or localized changes in a plant or plant tissue. For instance, radiation-induced plant tumors are being used to study the genetics and cell physiology of abnormal cell growths. The chromosomal alterations resulting from ionizing radiation have been used extensively in the study of induced heritable changes in plants and also to learn more about chromosome structure and behavior. The increased yield of mutant forms following appropriate radiation treatment makes detailed study of the mutants and the mutation process much easier and provides an ample supply of heritable variation, a portion of which is potentially useful in agriculture, horticulture, etc. When the natural variation of certain crops is inadequate, radiation can be used to produce mutants with increased disease resistance or other desirable agronomic characteristics. Thus, radiation-induced mutations now play an important role in practical plant improvement.

TWELFTH BROOKHAVEN LECTURE

By DR. LEWIS K. DAHL
MEDICAL DEPARTMENT

Title:

EXCESSIVE SALT INTAKE
AND HYPERTENSION:

A DIETARY AND GENETIC INTERPLAY

Lecture Hall: 8:00 p.m., Wed. Dec. 13

A buffet supper (\$2.75) will be served at the Brookhaven Center before the lecture, beginning at 6:00 p.m. Reservations should be made at least one day in advance by calling Ext. 2302 before 5:00 p.m., or Ext. 2453 in the evenings.

Refreshments will be available in the Research Staff Lobby following the lecture.

IRMA LA DOUCE TICKETS

Discount tickets for the hit musical "IRMA LA DOUCE," playing at the Alvin Theater, New York City, are currently available at the Personnel Office.

ATTENTION RESERVISTS!

Members of Naval Reserve Research Company 3-9 are reminded that December meetings will take place one week earlier than usual. Wednesday, December 6, and Wednesday, December 13, are the dates to remember!

NIMRODS ARCHERY CLUB

The Flint round with the Republic Archers came to a close finish. At the half, Republic was way out in front with plenty of points to spare. The Nimrods got started in the second half, but was not in time to win the round. The team scores were: Republic, 2209; Nimrods, 2198. High scores for the day were Di Salvo, 615; Johnson, 573; Furman, 525; and Humphry, 485.

Another match is scheduled in the near future and will be announced in the BULLETIN BOARD.

OPERA NEWS

To expedite your Opera reservation, please note the following:

1. For **information** on prices, schedule, seating arrangements, etc., call Ext. 2106 or stop at the Personnel Office reception desk.

2. For actual **reservations** for specific performances, call Ext. 395 or 2102 between the hours of 10:00 a.m. and 12 noon only.

3. There is a **limit** of 4 tickets per order.

BULLETIN BOARD CLASSIFIED AD POLICY

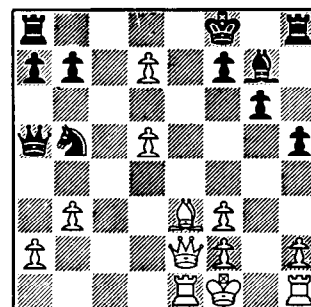
1. Employees only may place ads in THE BULLETIN BOARD.
2. All items advertised for sale must be property of an employee.
3. Real estate ads will be accepted only when they involve change of residence by an employee, and are accompanied by a statement of ownership and change of residence.
4. No ads for business purposes will be accepted.
5. Ads must be submitted in writing (preferably typed) by 3 p.m. Friday for inclusion in the next week's newspaper. Address the ads to THE BULLETIN BOARD, 58 Brookhaven Avenue, or deliver them to the Personnel Office. Ads must contain a signature and Laboratory telephone extension. If you do not want your name to appear when the ad is printed, put it in parentheses.
6. Ads are run on a space available basis. If your ad does not appear due to space reasons, it will be held for inclusion in the next issue of THE BULLETIN BOARD.
7. If you wish to repeat an ad, it must be re-submitted.

UPTON RIFLE-PISTOL CLUB

The regular monthly meeting will be held Thursday, December 7th, at 8:00 p.m. at the Recreation Hall. The shooting schedule and social events for 1962 will be discussed.

CHESS PROBLEM

In this week's problem it is White's move. Black is a piece ahead. How would you play it and who's to win? Answer elsewhere in this week's BULLETIN BOARD.





BERA BOWLING

RED LEAGUE

The Utilities resumed their number one position by defeating the Ah-Sos 3-1. Sharpshooters for the winners were M. Iarocci, 201/521, T. Iarocci, 184/501, and Connelly, 201/516. Ah-Sos' best was Brockbank, 174/467.

The Downunders walked away with 3 points from the H.P. Ins, Guacci being the big gun with a 185, 190/544. For the H.P. Ins, Lacey rolled 174, 174/507.

The H.P. Outs took 3 points from Biology with the help of Champagne's 158/413. Biology's Berech went for 159, 169/478.

The Cosmos belted the Mecas 3-1. Doing some of the better belting were Dexter, 174/495, Hoyle, 208/490, and Skelton, 205/488. The Mecas tried hard, but it just wasn't meant to be - even with the handsome scores of 231/543 and 233/497, respectively, from the McGrann-Le Hecka combination.

GREEN LEAGUE

The Black Birds wholloped the Reefers 4-0. Niglio's 196, 214/592 was all the Birds needed. The Reefers' Ratyca and Scandizzo rolled 191, 199/251 and 209/557, respectively.

The Fire Department also took the Old Timers III 4-0. Kinney and Takats led the way for the winners with scores of 210/553 and 198/584. For the losers, Tierney rolled 180/515, and Walker, 214/553.

With each man rolling over 500, the Electrons beat the Old Timers II. Tomesch, Cobb, Danner and Dvorak had the following scores: 201, 198/562, 186/503, 211/534, and 194/522. For the Old Timers, Frei rolled 189/503, Holmquist, 212, and Reams, 193, 182/548.

The Gnats lost to the Old Timers I, 3-1, in spite of Bachsmith's 190/497 for the Gnats. Old Timers' Adams bowled 193/512.

PURPLE LEAGUE

The Phoubars held the Bowl Aids down 3-1, the latter team being unable to get the ball on the head pin. Caiazzo and Gardenier rolled 186/505 and 183/493, respectively, for the Phoubars. Bowl Aids' best were Sawyer, 161, and Schultz, 167.

The Scotches outbowled the Designers 3-1. Scotches bowling were Mead, 176, and Galen, 171. Designers trying were Rocklein, 183, and Cuccia, 178/490.

Fiscal and the Hopefulls played a very close match, with Fiscal coming out on top for 3 points. Furnishing the points were Rose, 176, Coughlin, 176, and Eberbach, 174. Hopefulls trying were Sundberg, 199/548, Kuzmack, 166/497, and Thomson, 167.

The Woodbutchers and the Toppers shared their first game and divided the next two, the Woodbutchers winning the match 2½-1½. Leading the winners were Ruppert and Milian, with 170 and 179 respectively. The Toppers had Reany, 204/511, and Scatton, 177.

BLUE LEAGUE

The Leftovers and Bubble Finks rolled it off with the Finks taking 3 points. The fact that



SPECIAL

BOWLING

EVENT

Your scheduled bowling night during the week of December 11 will be a special events night, sponsored by the Bowling Executive Board.

The team bowling the highest gross series during that week will win five (5) lettered team bowling shirts. The winning team may purchase additional shirts at cost if they so desire.

This is an inter-league event with all 40 BNL bowling teams competing for the prize.

TAPE RECORDER ?

B.E.R.A.'s tape recorder, a V M700, "Tape-o-matic" in a pinkish-tan case, has been misplaced. Information as to its whereabouts will be appreciated. Please contact the Recreation Office, Ext. 391.

GYM CLOSED

Because of a scheduled Christmas party, the Gym will be closed for all physical activities on the day of Wednesday, December 13.

RECREATION BUILDING

The Recreation Building will be open only for department Christmas parties as scheduled on December 13, 14 and 15.

SKI CLUB

The first trip of the year will be on the weekend of January 13-14 and not on January 9, as reported last week.

Plans for this trip will be made at the next club meeting which will be held, because of the concert, on Tuesday, December 12 at 8:00 p.m. in the Recreation Hall. Anyone who can't attend the meeting may call Nancy Ashton, Ext. 2532, or Eugene Raka, Ext. 310, for details about the trip.

ANSWER TO CHESS PROBLEM

White wins simply by B-N6.

the Leftovers rolled on "Alley 13" must have worried some of their team members, but it didn't worry Ruege with a 188 H.G., nor Uddman who rolled a 179-180-200 with a 559 series. Brady, for the Finks, pushed hard with a 168 H.G. for his team. Baer with his steady bowling helped too.

Well it looks like the Splitters had fish (the Techs) this time around and they (the Splitters) took 3 points from the Fish. It looks like everybody on the Splitters went big this time. Spira rolled a 180 H.G. with a 498 series, Carter rolled a 181 H.G., Gallagher rolled a 188 H.G. with a 505 series, Sparacino rolled a 195 H.G. with a 507 series, and their Captain pushed out a 200 H.G. with a 519 series. As for the Fish (the Techs), Heins rolled a 180 H.G. with a 524 series and Larsen rolled a 226 H.G. with a 599 series. That's the "tall and short" of the Techs.

The Needlers and Nuclides met again and the Needlers took 3 points out of the 4. The Needlers were led by Singer who rolled a 188 H.G. with a 499 series. He was backed up by Sunyar who rolled a 176 H.G. with a 466 series, and Majeski with a 160 H.G. with a 458 series and Kukacka rolled a 160 with a 447 series.

The Sleepers and the Skins went at it hard enough to split 2 for 2. The Skins must have meant business this time for they had six men present. Weinmann rolled a 178 H.G. with a 466 series. Schroeder rolled a 166 H.G. with a 468 series. Remy rolled a 172 H.G. with a 452 series, and Bugala rolled a H.G. of 189. The Sleepers rolled with four men; Meier pushed hard with a 179 H.G., 503 series; Lypecky rolled a 170 H.G. with a 479 series.

The Alleygators and Bubble Boys rolled it off again, but it looks like the Bubble Boys ran out of bubbles and the "Gators" took all 4 points. The "Gators" came out of the slump Lambeck rolled a 164 H.G. with a 468 series, McGovern rolled a 176 H.G. with a 456 series, and Stelmaschuk rolled a 160 H.G.

CLASSIFIED ADS

FOR SALE

1951 FORD - Very fine cond., 2 dr., r&h, new battery, water pump and carburetor, tires, Ext. 717.

1957 PLYMOUTH BELVEDERE - 4 dr. sedan, auto. trans. 56,000 miles, excell. cond. S. Pickart, Ext. 402.

1957 FORD FAIRLANE - T-Bird V-8, Fordomatic, power brakes & steering, 46,000 miles, one owner. Excell. cond. See to appreciate. Must sell - \$595. Jellett, Ext. 2188.

1955 PLYMOUTH - 4 dr. V8, std. shift, newly painted. \$350. AT 4-8325 or Ext. 2231.

1955 OLDS 88 - 4 dr. Holiday. Full power. Reiff, Ext. 481.

1955 PLYMOUTH - 4 dr., r&h., auto. trans. good cond. could use tune up. Closest and first offer to \$200. Can be driven at your convenience. B. Howard, Ext. 2314.

1960 VALIANT - Ex. cond. Reasonable. Reason for sale: too many cars in family. AT 4-1569 after 6:30 p.m.

1950 DODGE - Fluid dr., r&h, good cond. Tires nearly new. Ext. 614.

1952 CONSUL (ENGLISH FORD) - New tires, r&h, gd. gas mileage. Make offer, Braddon, Ext. 2375.

1951 4 DOOR CHEVROLET - Excel. cond., good tires, new battery. Asking \$150. Ext. 2382, Reilly.

1956 VOLKSWAGEN - Transporto Panel Truck, new engine. \$550. AT 1-6544 after 6 p.m.

HOUSE - Bellport, walking dist. of bay and village. Two acres plus landscaped and wooded area. LR with fireplace, DR, TV rm, Youngstown kitchen, elec. range, dishwasher, washer and dryer, and HW heater. 3 BR and 1 full and 2 1/2 baths. Full cellar, H.W. oil fired heat, patio, jalousy porch, and alum. comb. window. 3 car garage. Asking \$27,000. Mortgage terms arranged. Ext. 2210 or AT 6-8876.

CAPE COD HOUSE - 4 bedroom, attached garage, 2 baths. St. James. JU 4-6748 after 6 p.m.

House - 7 rm. ranch, Bellport. 95 x 175, 2 or 3 bedrms., liv. rm., dining rm. den, patio, 2 baths. Oil/Hot water heat. Compl. landscaped. Owner leaving Lab., must sell Asking \$17,000. Ext. 2109 or AT 6-0789.

BOAT - 18' Thompson completely refinished, new hardware, rebuilt zero time twin 25 h.p. Johnsons, electric starter, controls, Navy Top, covers, new batteries on purchase. \$1200. Ext. 483 or AT 9 0854.

TWIN SCREW CRUISER - New, 32 1/2 x 12 1/2 ft., sleeps six, 12 volt, hydraulic reverse 115 hp Gray Marine motors, 200 gal. fuel. AT 4-0458.

BOAT - 1958 Whirlwind 14 ft. Molded Mahogany. 1959 Evinrude 35, controls, windshield, wheel, cushion, etc. Boat excell. Motor as new. \$550., Ext. 2316.

CROSBY FIBER GLASS RUNABOUT - 17 ft., ideal for water skiing. 80 h.p. Mercury Motor. Both boat and motor new in 1959, as new cond. today. Asking price \$1800. Ed Foster, Ext. 426, or AT 4-0730.

LIONEL FREIGHT TRAIN SET - Engine, 5 cars, 2 pair remote switches, uncoupler, operating coal loader and lumber mill, large transformer and double loop of track, plastic buildings, etc. \$30. J. Weiss, Ext. 2472.

AUTOMATIC WASHER - for sale, 2 year old G.E., or willing to trade for 8 m.m. Projector with screen or stereo amplifier with speaker system. H. Houtsager, Ext. 2950 or AT 6-0961.

BICYCLE - 24" girls lightweight with baskets. good cond. \$15. Ext. 2230.

BIBLE - King James version. Leather bound; each page individually bound; many full color illustrations. Beautiful Xmas gift. Brand new. \$35. Robinson, Ext. 2200 or HR 3-2973.

WESTINGHOUSE CONSOLE TV - 23 in. Very fine cond. \$40., Ext. 717.

EMERSON RECORD PLAYER - portable, automatic changer, 5 months old, 4 speed. \$35., Ext. 717.

CONN TROMBONE - two years old in perfect cond. Used only six mos. \$90. W. Freese, Ext. 2520.

GIRLS 20" BICYCLE - Needs a little fixing up, but otherwise in good shape. \$10. W. Freese, Ext. 2520.

FIGURE SKATES (2 PR.) - girls white leather, size 3, \$4; size 4, \$5. Both excell. cond. Harbottle, Ext. 2267.

MEN'S FIGURE SKATES, almost new, size 10 - \$15; Also, Toddler Gym \$15; car bed \$2; upholstered arm chair - \$25. AT 6-0428 or Ext. 301-7.

WASH MACHINE - 3 lb. portable \$30. Also, "Electric Broom", \$15; and baby carriage with mattress, bag. \$19. F. Mo. Ext. 540.

AUTOMATIC WASHER - 2 years old. 2 cycle Kelvinator. Excell. cond. \$65. R. Sollanek, Ext. 311 or LT 9-5469.

ELECTRIC CLOTHES DRYER - 220 volt, 3 drying cycles, very gd. cond. Ext. 2220 or HR 3-2912.

SNOW TIRES - 2, good cond., 670-14 with tubes and rims, \$25. Ext. 2210.

1958 LAMBRETTA - \$100, Lehman, Ext. 301.

ICE SKATES - Black figure skates, 1 pr. size 3, \$3; 1 pr. size 8, \$4; 1 pr. size 10 1/2, \$4. Fred, Ext. 687.

1 SINGLE BED - With box spring and mattress \$45; 1 colonial double bed (Maple) - \$20. 2 studio beds brand new, firm innerspring mattress and matching boxspring. Orig. cost \$90. ea. Selling for \$60. ea. Call 664.

G.E. F.M. TUNER - in walnut cabinet - \$20. Triad 10 watt amp. \$10. R.M.E. 152A, 2-6-10 meter V.H.F. tuneable converter. Excel. cond. \$25. B. Howard, Ext. 2314.

FREEZER - Manitowac-sub-zero, 14 cu. ft. \$50. Ext. 565.

BABY'S PLAYPEN - Thayer, ex-cond. S. Kalish, Ext. 2524.

ICE SKATES - Boy's, age 4-7, size 11 1/2 C. Hockey Box Toe, worn twice. Sell for \$5. or will trade for size 4 or 5. Ext. 2184.

CRIB & CHEST SET - Beaut. cond., lime oak, mattress not incl. Both \$50. Ext. 301-110.

LIONEL TRAINS - 027 gauge, 2 locomotives, many cars, track, transformers, coal loader, log loader, stations, etc., etc., Complete set, \$45. R. Young, Ext. 591.

MAPLE LIVING ROOM SET - Grandma Moses style. 1 couch, 1 rocker, 1 stationary chair. Gd. cond. Frank, Ext. 772.

LIONEL TRAIN - Great South Bay & Eldorado R.R. 027 gauge Lionel. 100 track sections, 10 switches, 3 freight locomotives, etc. As a unit \$80. Garfield, AT 6-0824.

TELEVISION - 1956 17 in. Emerson table model. New pic. tube this year, guaranteed. \$50. Also, AM-FM radio, RCA table model. Cost \$135 new, now \$25. Majestic, Ext. 2143.

WANTED

TARPAULIN - For boat. About 15 by 30 ft. Braddon, Ext. 2375.

SLIDE PROJECTOR - 35 MM. Reed, Ext. 2182.

REMOTE SWITCHES - American Flyer "s" gauge. Fink, Ext. 1346.

MALE KITTEN - Gray, part angora. J. Herbert, Ext. 2100.

ENCYCLOPEDIA BRITANNICA - Set, not over 10 years old. Mather, Ext. 301.

SHOP POWER TOOLS - Bench Saw, etc. Reiff, Ext. 481.

HOUSE TO RENT - 2 bedrms., unfurnished, but with appliances. Couple with no children. North or South shore. Dr. Lax, Ext. 301 or 523.

FULL SIZE VIOLIN - Ext. 565.

HOME FOR KITTENS - Homes for two very soft and fluffy seven (7) week old female kittens, one black, one grey. J. Vise, AT 6-0583.

WHITE KITTEN - Needed in time for Christmas. G. Cross, Ext. 2260.

BABY-SITTING JOBS - Capable woman will watch children for working parents. Vic. Patchogue. Frank, Ext. 772 or AT 6-8408.

CARPOOLS

Looking for driver to form 2 man carpool from Brookhaven. Ext. 2950.

Want to form or join car pool from Holbrook area. Ed. Gill, Ext. 2314.

LOST

WEDDING BAND - White and yellow gold, lost on way to Medical Building on 11/27/61. Hillen, Ext. 301-55.

WRISTWATCH - Bulova, stainless steel with matching band, sweep second hand, Reward. Zukowski, Ext. 2389.

SET OF KEYS - Black case. Stohr, Ext. 2334.

RECREATION ARTICLES

All Recreation articles for publication in the BULLETIN BOARD should be presented at the Recreation Office no later than Friday for publication in the following week's issue.