

Corn: A Basic Research Tool

For the last two summers, two acres of corn have been planted by the Biology Department near the recharge project. The harvest will not be put on the table, but is part of a basic research project, with a secondary goal of effecting nutritional improvement in corn.

Ben and Frances Burr are the principals involved in this research and they came to



Marjorie Neuberger and Ben Burr examine the ear of a greenhouse grown corn plant used in genetic research to improve nutritional quality of the grain.

the Laboratory in May 1976. Marjorie Neuberger, who has been at Brookhaven since 1967 is assisting in the work. The researchers are using corn for their project because of its economic importance and, as Burr says, it is the best understood genetically of all the higher plants.

The corn kernel is moderately low in protein - about 10 percent - but is particularly deficient in two essential amino acids, lysine and tryptophan. Thus, people and animals who get their entire diet from corn suffer protein malnutrition. Half the protein in the kernel is of one kind - zein - and it is missing these two essential amino acids.

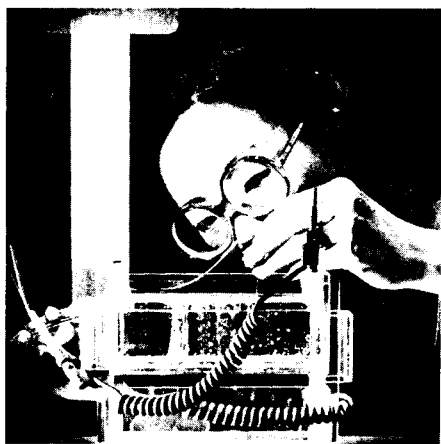
The Burrs are trying to change the amino acid composition of corn by altering the amino acids found in the zein protein. As simple as this idea is, its implementation is a long term project. To accomplish this, they are doing controlled pollinations of corn in the field and biochemical studies in the lab.

Their basic research involves finding out how zein is made and determining the genes which control its primary structure. The Burrs have described a novel mechanism for the synthesis and packaging of zein at a unique site in the cells of the growing corn seed. Taking advantage of this happy circumstance, they have isolated the zein messenger RNA. (A messenger RNA is a ribonucleotide polymer complementary to the deoxyribonucleotide sequence of the gene and containing the information for the specific arrangement of amino acids in a protein).

In collaboration with scientists at Stanford University, they have amplified the zein messenger RNA sequences many thousand-fold by using recombinant DNA technology. As summarized by Burr, this technique permits double-stranded DNA sequences synthesized from isolated messenger RNA to be prepared and inserted into bacterial plasmids. These cloned sequences are very useful tools for identifying complementary sequences in genomic DNA. It is therefore possible and otherwise characterize eukaryotic genes, accurately count the number of times they are repeated in the DNA of different tissues, and determine their chromosomal location where genetic markers are not available.

Ben Burr has his Ph.D. in genetics from the University of California at Berkeley and Frances obtained her Ph.D. in botany from the same university. At the University of Wisconsin, they spent two years working with corn geneticist Oliver Nelson where Ben says "we learned to appreciate the plant and how to work with it." The following two years Ben spent at the Pasteur Institute in Paris engaged in bacterial research, and Frances at the Sorbonne working on green algae. In the fall of 1974, they went to Oak Ridge National Laboratory where they began working together on their current project.

Through this particular plant, they hope not only to do something useful in improving corn as a foodstuff, but also to contribute to basic genetic research.



Frances Burr applies a protein sample to be analyzed electrophoretically on a polyacrylamide gel.

Cricket Ball Alert

The Cricket Ball is a sell-out and everyone is looking forward to a lively evening. To make sure that all goes smoothly right from the beginning, ticket holders are reminded that the snow has considerably limited parking space around the Center, and they should make plans accordingly. The committee suggests car pooling so that as few cars as possible need be accommodated.

If parking spaces at the Center are filled on your arrival, you are asked to park your car in the parking lot adjacent to the cafeteria. Bus service will be provided to and from the Center during the hours of 8:30 p.m. to 1:30 a.m.



Dr. Walter Marshall talks to staff members and reporters after his lecture at Brookhaven this week.

Preventing Plutonium Proliferation

A proposal to make plutonium non-proliferating and virtually inaccessible to those who wish to make weapons out of it, was described by Dr. Walter Marshall, Deputy Chairman of the United Kingdom Atomic Energy Authority, at a lecture at Brookhaven on Tuesday.

The fear of governments making weapons from plutonium, or terrorists stealing it for the making of bombs, is so pervasive, said Marshall, that the only way to tackle the problem is to reduce the availability of plutonium. These same fears are bringing the nuclear power program to a standstill, and Marshall said he makes the assumption that "the world must have nuclear power" and fast breeder reactors in particular.

As Marshall sees it, the question of storage has been the root of the problem. Currently, plutonium is produced from enriched uranium in thermal reactors and the spent fuel rods are then stored at many reactor sites for indefinite periods. A once-through cycle leads to setting up plutonium "mines" throughout the world, said Marshall, and "this is not a wise policy."

Although it is difficult to get plutonium out of spent fuel elements initially because the gamma activity is so high, this state of affairs would not continue indefinitely. According to Marshall, experts differ widely as to when the plutonium would become "accessible" - but it would be relatively accessible after about two years.

The proliferation risk of an indefinite storage policy is large, he asserted. The plutonium becomes more accessible as time goes on and creates a "proliferation time clock. I won't say time bomb, because you don't know when it would go off," said Marshall.

The solution, he feels, is to restrict the plutonium to as few sites as possible, under international supervision, reuse the uranium, and use the plutonium in fast breeder reactors.

Fast breeder reactors are much misunderstood, says Marshall. He stressed that

they do not breed fast, "they use fast neutrons and breed slowly." The facts are, he said, that the maximum production rate of plutonium from a fast breeder reactor is slower than from a thermal reactor; the actual rate can be even lower since what is put in the blanket (surrounding the core) acts as a form of "birth control;" and there is always the option of having a zero level of net production.

To make the system as proliferation resistant as possible, Marshall, in collaboration with Chauncey Starr, president of the Electric Power Research Institute in Palo Alto, has devised a fuel fabrication scheme that would use the uranium and plutonium contaminated with selected fission products. Therefore, the decontaminated plutonium produced by present reprocessing can be avoided. The quantity of plutonium would never reach levels high enough to make a nuclear bomb. The mixture would not only be used as the reactor fuel, but the blend would be so radioactive that no one could divert it without very elaborate processing equipment.

Marshall said that he was concerned that people's misconceptions about the future led to lack of action now. He and Starr disclosed their new recycling process at a conference in Washington last week.

Anievas Concert

The distinguished American pianist Agustin Anievas will present a recital on Wednesday, March 15 at 8:30 p.m. in Berkner Hall. The program will consist of Beethoven's Diabelli Variations and Liszt's Sonata in B minor.

Admission:	\$4.00
Students with ID and persons over 65:	\$2.00
Persons under 18:	\$1.00

Portrait Of An Endangered Species

If the average visitor to Paris ever encounters a concierge, he is likely to be an important member of the staff of his hotel, a man who takes care of such things as arranging tours or obtaining tickets, and who is an inexhaustible source of useful bits of information. If our hypothetical tourist visits the Palace of Justice, he will probably see the Conciergerie, three superb Gothic halls built in the 14th century, and used as a prison, particularly during the Revolution. And what is the connection between the hotel concierge and the Conciergerie? The term "conciierge" was originally applied to a member of the court who was the governor of the royal household. Obviously a man as important to the royal family as Hudson was to the members of the Bellamy family in "Upstairs, Downstairs."

In contrast to the tourist, the average resident of Paris has a very different view of a concierge, because it is the person, generally a woman, who lets him into his apartment house when he pushes the button beside the front door. To him, the concierge is a woman of many parts - doorperson (who may take it upon herself to turn away callers she thinks are unsuitable), cleaning lady, deliverer of messages, nosy busybody (the Emperor Napoleon made the concierges into police agents). Hardly a member of the nobility, but member of a very distinct class with the power to make apartment living a heaven or hell. Today the French, like the rest of us, are going through a painful process of automation, and the concierge is gradually being displaced by push-buttons, lobby telephones, and perhaps even closed-circuit TV.

This disappearing French institution will be presented in the form of 54 photographic portraits entitled "Les Concierges de Paris," at an exhibit in Berkner Hall from March 20 to April 5, co-sponsored by the BNL Art Committee and *Le Cercle Français de BNL*.

The portraitist is Michelle Vignes, a French reporter-photographer who lives in Paris and San Francisco. Her work has



One of the principals in the photographic exhibit "Les Concierges de Paris" to be shown in Berkner Hall.

been published in *Time*, *Life*, *Newsweek*, *Horizon*, *Paris-Match*, and *l'Express*, and has been exhibited in museums in the U.S. and France. The circulating exhibit comes to us thanks to the Alliance Française/French Institute of New York. It has already appeared in several major U.S. cities.

The exhibit will officially open at 8 p.m. on March 20. It was intended to call the opening a "vernissage," the traditional French term for such an event, but the term implies the presence of the artist and this will not be the case, unfortunately. However, there will be cheese and wine - in view of the theme of the exhibit, a modest little wine.

Please note that the exhibit, which was originally scheduled to open on March 13, has been postponed to March 20.

VLA - Operating While Building

Although it is still some three year's away from its completion date, the Very Large Array (VLA), the world's most powerful radio telescope, is available for use by qualified scientists, according to David Heesch, Director of the National Radio Astronomy Observatory (NRAO). The VLA on the Plains of San Augustin, 50 miles west of Socorro, New Mexico, is managed by NRAO, Brookhaven's sister laboratory.

Of its 27 antennas, each 82 feet in diameter and weighing 210 tons, 10 are in use, five are being fitted with radio receivers and 12 are under construction.

Because of its power and flexibility, Dr. Heesch said, the VLA will be a leading instrument in the world for research on the physics of radio sources beyond the Milky Way galaxy. It also will be of great help to researchers studying the structure of the universe, the structure and evolution of stars, and the chemical constituents of the great clouds of gas that lie between the stars. Using the VLA to investigate radio galaxies and quasars, scientists expect to increase our understanding of how these sources produce such large energies and of the physical processes and laws relating to gravity, magnetic fields, and plasmas.

Using a powerful technique called aperture synthesis, the VLA will receive radio signals from celestial objects and produce radio "pictures" with a clarity and resolution equal to the largest optical telescopes. Aperture synthesis is a technique in which signals received from several small radio telescopes are combined in such a manner as to give a resolution that would be obtained by a single much larger radio telescope. These pictures give information about objects and physical processes that cannot be studied using optical techniques alone.

Steering Group Meeting



Brookhaven was host last week to the General Purpose Field Facilities Steering Group of DOE. The task force, which is composed of representatives of DOE laboratories, field offices and HQ personnel, has been holding a series of meetings to assist DOE in a survey and evaluation of the problems and space needs of the various facilities. At Brookhaven, Vincent R. O'Leary (left), who is chairman of the Survey and Multi-Year Plan Working Committee, talked with DOE's David Israel, Director of the Secretariat, Field and Laboratory Coordination Council. Among other items on this meeting's agenda was the presentation of a first draft of a sample survey dealing with the rehabilitation or replacement of existing general purpose facilities. The questionnaire was developed by Louis Harson, BNL's Principal Architect, and Robert Mayer of the DOE Controller's staff.

BNL Lecture

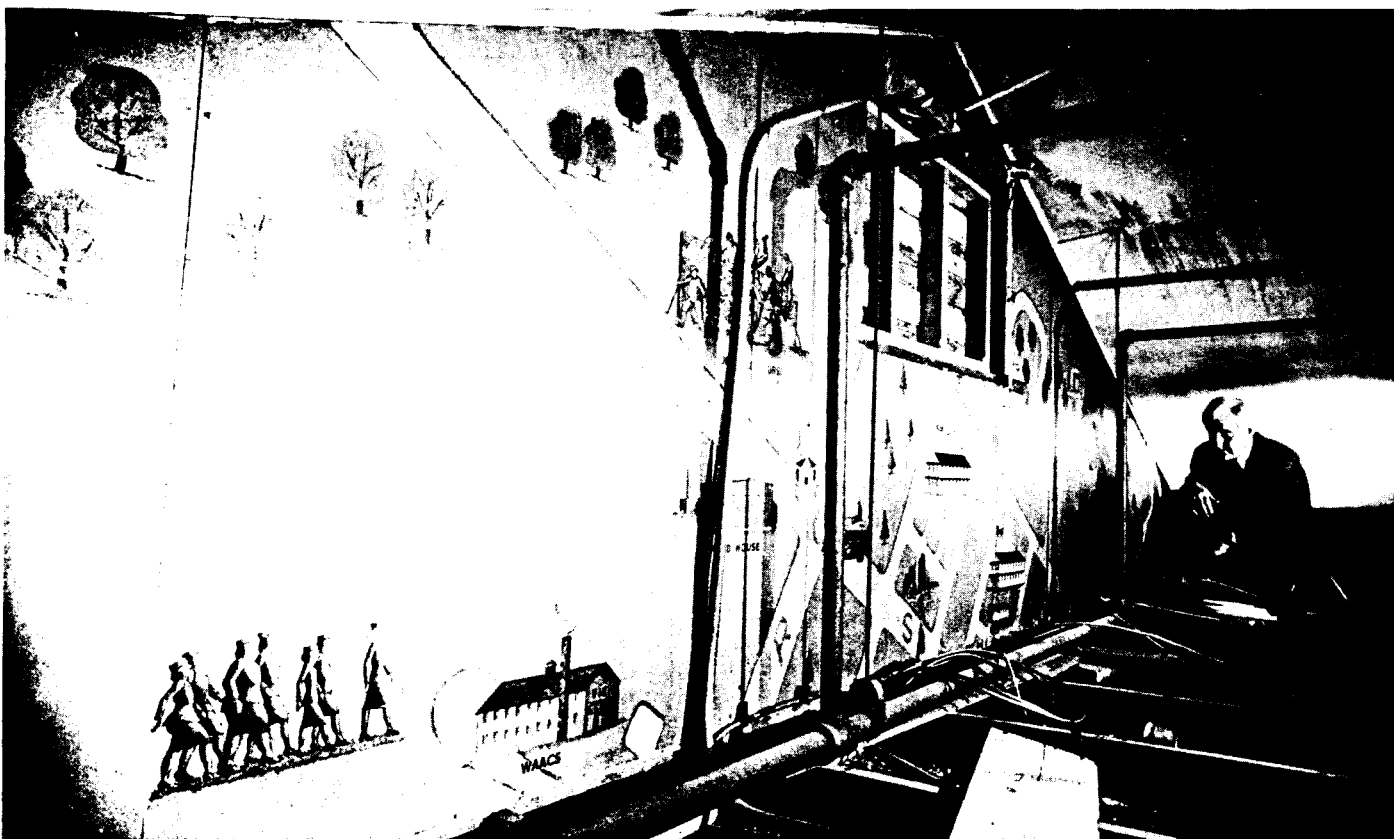
Herbert J. Kouts, Chairman of the new Department of Nuclear Energy, will discuss that department's plans and programs, at 3 p.m., Wednesday, March 15, in Berkner Hall.

Indoor Tennis

The Saturday afternoon indoor tennis has been moved to Sunday from 10:30 a.m. to 5:30 p.m. Players may gain access to the gym by contacting the pool attendant. Reservation forms for Sundays will be posted on the gym door near the fountain at 11:00 a.m. on the previous Monday. Forms for Tuesday evening play will be posted at 11:00 a.m. on the previous Tuesday. There is a limit of one reservation per week for each player.

Baffa Symphony

The BAFFA Symphony Orchestra, with duo pianists Doris Anne McMullen and Dwana Holroyd, will present a concert on Saturday, March 18 at 8:30 p.m., Sayville Junior High School, Johnson Avenue, Sayville. The program will include Bach's Two Piano Concerto in C Major, Dvorak's Symphony #8, Saint-Saens' Carnival of the Animals, and Tchaikovsky's Nutcracker Suite. Tickets purchased in advance are \$3.00; at the door, \$4.50. For ticket outlet information call 588-5909.



Another reminder of Camp Upton came to light recently. Carpenters are remodeling a section of Building 197 and, in the course of their work, discovered a portion of a mural dating back to World War II. Larry Fuller (above) says this is not the first time he has seen the painting. Building 197 has undergone several renovations and, at one time, he

said, the whole mural was visible. Apparently, the building was once the non-commissioned officer's club and the mural, covering the south wall right up to the peak, was in the reception area. As soon as the carpenters complete their work, the small portion uncovered, will be once again lost to view.

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Theatre Group Meeting

There will be a meeting of the theatre group on Friday, March 17 at 8 p.m. at Berkner Hall. Readings from three plays are planned and *all* interested employees are welcome.

Arrivals & Departures

Arrivals

Joseph A. Boniface.....Applied Math.
Andree-Marie Kendirgi.....Accelerator
Jai H. Lee.....Energy & Env.
James B.A. Mitchell.....Chemistry

Departures

Maryann Straka.....Director's Office

On The Air

Tune in to radio station WBAB (102.3 on your FM dial) on Sunday, March 12 at 11 p.m. or Saturday, March 18 at 7 a.m. Andrew Hull, Supervisor of Environmental Monitoring in the Safety & Environmental Protection Division, will participate in a program on Radiation and Nuclear Energy.

Cafeteria Menu

Week Ending March 17, 1978

Monday, March 13

Tomato bouillon
Franks and beans 1.10
Barbequed fresh ham and 1 veg. 1.40
Hot Deli - Pastrami (on bread) 1.15
(on roll) 1.25

Tuesday, March 14

Minestrone
Saga's homemade lasagne and 1 veg. 1.35
Chopped steak and 1 veg. 1.10
Hot Deli - Knockwurst (on bread) 1.15
(on roll) 1.25

Wednesday, March 15

Special

Cup of Shillelagh potato soup
Corned Beef and cabbage, O'Brien potatoes
or O'Leary spinach, Irish soda bread,
Emerald Isle Cake - small soda, coffee or tea
\$1.87 plus tax

Scalloped apples and sausages 1.25
Hot Deli - Roast beef (on bread) 1.25
(on roll) 1.35

Thursday, March 16

Venetian vegetable
Short ribs of beef and 1 veg. 1.40
Fried rice and pork w/Chinese noodles 1.30
Hot Deli - Barbequed beef (on bread) 1.15
(on roll) 1.25

Friday, March 17

Clam and celery soup
Pot roast and 1 veg. 1.40
Seafood cakes and spaghetti 1.10
Hot Deli - Smoked tongue (on bread) 1.15
(on roll) 1.25

Service Awards

2-995-78



A number of service awards were presented recently to employees of the Central Shops Division. Foreground, Joe Mammina (20 years); 2nd row (from left) Walt Bigelow (20), Phil Reany (20), Ben Ackert (30); 3rd row (from left) Art Rosenka (20), Chet Bubka (20), Art Beckwith (30), Bill Elasiak (20); rear (from left) Manager Robert Lehn, who presented the awards, Garfield Langhorn (10), and Ken Thomson (30).

Camping Club

The regular monthly meeting of the Brookhaven Family Camping Club will be held on Thursday, March 16th, at 8:00 p.m., at the Recreation Hall. All are welcome. Refreshments will be served.

Easter Hams

A limited number of smoked hams (bone-in) are now available from the Cafeteria. Give yourself a holiday and leave the cooking to Saga Foods. Call Ext. 3541. Price: \$1.59 per pound.

Volleyball

On March 1, 1978, the Cool Tools toiled Biology: 21-8, 21-4, 21-13. The Spikers beat the Atom Spikers: 21-23, 21-9, 21-17. The Easy Aces forfeited three to Phoenix.

Standings

Cool Tools	9	0	1.000
Spikers	8	1	.889
Biology	3	3	.500
Bumps	3	3	.500
Phoenix	3	3	.500
Atom Spikers	1	8	.111
Easy Aces	0	9	.000

Mixed League

Division A

On March 6, No Names swept the Nads: 15-12, 15-5, 15-1. Lookin' Good popped the Popovers: 15-11, 15-12, 15-12. Assorted DO-E-Nuts took the LeMufs: 7-15, 15-1, 15-9.

Standings

Lookin' Good	12	0
No Names	12	0
Nads	5	7
Assorted DO-E-Nuts	3	9
Popovers	3	9
LeMufs	1	11

Division B

Oceanography beat the Diamonds: 15-13, 16-14, 15-2. Nuts & Bolts over Cowturkey: 15-4, 15-11, 15-13. The Leftovers ruffed Riffraff: 5-15, 15-13, 15-12.

Standings

Oceanography	11	1
Nuts & Bolts	8	4
Diamonds	6	6
Leftovers	6	6
Riffraff	3	9
Cowturkey	2	10

Bowling

Green League

The Sparks secured a firm grip on first place as they took eleven from the Trouble Shooters. For the Sparks, B. Sick lead the attack with a 265/583 scratch series. The Old Timers II took eight from the Designers. The Blue Jays moved into a tie for third as they took eleven from the 76'ers. The Pinball Wizards could only take three from the Old Timers. G. Meinken had a 202 game. The Dyno-Mites managed eight points from the Pick-Ups. F. Humphry had a 205 while for the Pick-Ups, W. Sells also had a 205. The Got-A-Hit-Ums could only take three points.

Purple & White League

After the first position night of the second half, the Sea Gulls took over first place with the Stir Ups and the Pen Mac's tied for second. The Diamonds, Flounders and the Plutonium's are all tied for fourth.

Bob Jones had high game for the night with a 220/205 and high series 595.

For the ladies, Caryl MacDougall had high game with a 213 and high series 521.

Other good games were Ted Erickson 214, Nate Carter 208, Ed Sperry 201, Bob Brown 200, Gail Thompson 192/171, Pat Manzella 177/168, Adrienne Usher 170, Grace Kyhl 168, Marge Belligan 166, Ellie Murgatroyd 165, Gloria Brown 161.

Red League

The Anachems downed the Freon Loaders 11-0. T. Prach had a 204. F. Powers bowled well. The Old Timers took the Pinball Wizards 8-3. A great night for W. Reams with a 225/586/655 and H. Frei 201/534/624. The Bubble Boys took the Got-A-Hit-Ums 8-3 with S. Kiss having a 218/534/648 and R. Barberich a 207/573/657.

The Sandbaggers took 8 from the Cosmos. E. Meier had another good series 560/635 and R. Jones had a 207. The Designers only took 3 in their match with the Old Timers II. A. Pinelli had a 200 and J. Ferrero a 201. The 76'ers were skunked by the Blue Jays 0-11. R. Larsen bowled a 215.

Pink League

Most pins over average for three games go to Linda Feierabend once again with 99 and Dot Marelli with 91. This put the Personnelities three points out of second place. The Lickety Splits are holding onto first, Pinsplitters in second, Fiscal Assets in third.

High games were Cathy Van Noy 187, Dot Marelli 178, Lindora Boyd 174, Marie Grahn 167, Helen Keeley 166, Judy McNamara 164.

L.I. Industrial Tournament

The L.I. Industrial Bowling Tournament is being held at Mid Isle Lanes in Hempstead the nights of March 4, 11, 18 and 25.

After the first night of bowling, the Lab team is in the middle of the pack with no big scores being registered. Representing Brookhaven were Dick Larsen, Ken Riker, Richard Eggert, Bob Jones and Charlie Bohnenblusch.

Hospitality Committee

A morning coffee will be held in the Brookhaven Center on Tuesday, March 14, from 9:30 to 11:30 a.m.

Please come and bring the children. It is suggested that you bring along a toy or two for your child to play with.

