

New Findings Suggest Another Force

When discrepancies crop up during the analysis of data from a physics experiment, there are several things physicists might do. They might decide that the discrepancies are statistically insignificant, as did those who originally analyzed the results of a 1910 study of gravitational effects by

Hungarian scientist Roland von Eötvös. Or they might decide to look for the cause of the discrepancies.

Samuel Aronson and Ephraim Fischbach chose the latter course. Aronson, deputy group leader of the Omega Group in BNL's Physics Department, is an experimental physicist. Fischbach, who is at the University of Washington while on sabbatical from Purdue University, is a theoretician. Along with graduate students Daniel Sudarsky, Aaron Szafer and Carrick Talmadge of Purdue, they reexamined the results of the Eötvös study.

Their findings, published in the January 6, 1986, issue of *Physical Review Letters*, indicate that there may be a fifth force in the universe slightly modifying the effects of gravity. This speculation casts some doubt on the fundamental principle put forth by Galileo — that all falling bodies accelerate at the same rate.

The idea is that, in addition to the four known forces — gravity, electromagnetism and the weak and strong

forces, there may be a fifth force that Aronson and Fischbach suggest couples to hypercharge. (Hypercharge is a characteristic of some particles, just as ordinary electric charge is.)

This concept is generating enthusiastic, though cautious, responses from the physics community. At Brookhaven, for example, Physicist Hywel White said, "It's a remarkable observation, and, if it's true, it will set the world on its ear. Whether it's true or not is, in the scientific sense, open to some question. Nevertheless, it's a serious analysis of some old data, which has produced this new idea. And if there are no systematic problems in the original experiment, it would be hard to explain the results by any conventional means."

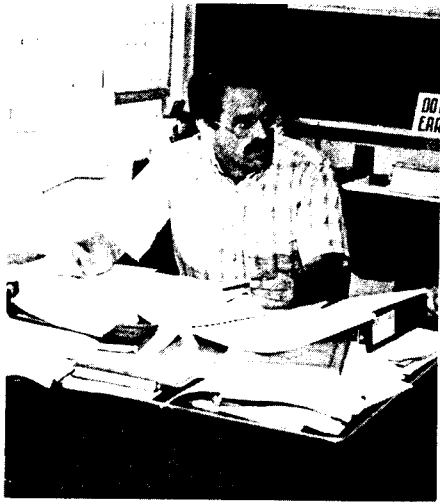
Former Laboratory Director Maurice Goldhaber, emphasized the need for further investigation. "My feeling is that it's an interesting hint that they have found in reviewing past work. But one will have to wait to repeat it with modern methods to see if it is real."

The Groundwork

Fischbach and Aronson began their long-distance collaboration around 1978. First, they analyzed discrepancies in data from K-meson experiments Aronson was involved in at Fermilab about ten years ago. "In our new analysis, we saw things that should not have depended on energy but apparently did," said Aronson.

They then looked for these effects in other experiments with neutral K mesons (K^0), but none have so far been produced with sufficient precision to test the revolutionary idea of a possible new force. In addition, they became intrigued by discrepancies in measurements of the gravitational constant being conducted in Australia, by Frank Stacey. Finally, they looked back at the Eötvös data, trying to understand them in the same terms as the K^0 results, and, said Aronson, "To our surprise, we found effects that were the same. Although we knew the Eötvös experiment was, in principle, sensitive enough, we were still sur-

(Continued on page 2)



Samuel Aronson

Design D Magnet: 1985 Engineering Achievement

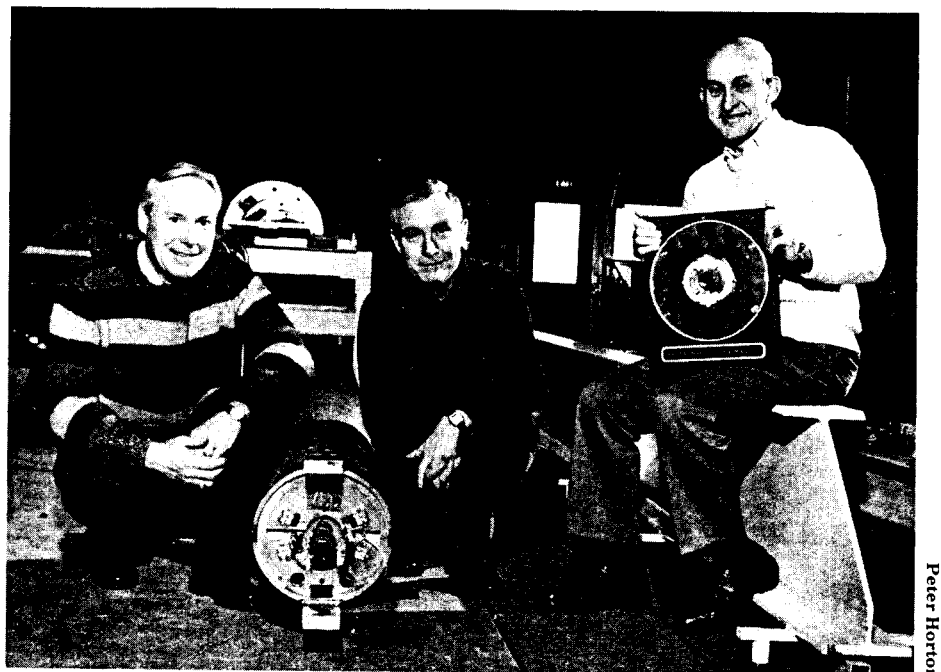
Today in Fort Worth, Texas, Physicist Per Dahl and Project Engineer William Schneider, Advanced Development Branch Magnet Division, will accept an award on behalf of the developers of the Superconducting Dipole Magnet. It has been selected as one of the ten Outstanding Engineering Achievements of 1985 by the National Society of Professional Engineers (NSPE) in their twentieth annual competition.

Among others, awards will also be presented to developers of the Space Shuttle Launch Complex at the Vandenberg Air Force Base in California, the U.S. Army Corps of Engineers' Tennessee-Tombigbee Waterway between Mississippi and Alabama, and the Over-the-Horizon-Backscatter East Coast Radar System in Maine. The Superconducting Dipole Magnet was nominated for the award by the Suffolk County Chapter of the New York State Society of Professional Engineers.

BNL, in collaboration with Law-

rence Berkeley Laboratory (LBL) and Fermi National Accelerator Laboratory, designed this superconducting magnet, which was recently selected as the design to be further researched and developed for the proposed Superconducting Super Collider (SSC). If built, the SSC will be the largest and highest energy accelerator in the world, thus providing further insight into particle physics. Within the SSC, the BNL/LBL/Fermilab dipole magnet would bend protons as they whiz around the accelerator close to the speed of light.

The magnet uses a niobium-titanium superconductor in a two-layer coil that is held in place with a stainless steel collar and an iron yoke. In tests, six 4.5-meter demonstration magnets exceeded their design specifications by reaching 6.5 tesla at a temperature of 4.5 kelvins. Six full-length magnets of 16.7 meters will be constructed this year. As a memento of the project, Dahl and Schneider will present a plaque on which a cross section from



Peter Horton

The Design D Dipole Magnet and (from left) Eugene Kelly, Magnet Division Section Head of Production & Engineering (P&E); Per Dahl; and William Schneider, Magnet Division Assistant Section Head of P&E, who is holding the magnet cross section plaque that will be presented to the NSPE.

a preliminary full-size magnet, 10% inches in diameter, is mounted. It will

be displayed at NSPE headquarters in Virginia after the awards ceremony.

BNL Lecture Blocking Toxins

William H. Adams is one of the principal investigators of a research project on a blue-green algal toxin, which is shared by the Biology and Medical Departments. In the next Brookhaven Lecture, "Preventing the Toxicity of Cyclic Peptides of Blue-Green Algae and Mushrooms," Adams, a scientist in the Medical

Department, will discuss some of their findings. The lecture will be in Berkner Hall on Wednesday, January 22, at 4:30 p.m.

The toxin, a cyclic heptapeptide, has been found to produce pulmonary thrombi, liver damage, and a marked decrease in blood platelets. It is isolated from blue-green algae strains known to cause death in animals drinking from ponds overgrown by the algae.

The Brookhaven studies have shown that a series of pharmacologically unrelated agents completely blocks the toxin's effects. These agents include hydrocortisone, India ink (the shellac component), carbon tetrachloride, trypan blue (and other diazo dyes) and some triazine dyes. Recently, the researchers found that the same agents also block two potent mushroom toxins, which can be lethal to humans. The toxins, phalloidin and α -amanitin, like the blue-green algal toxin, are cyclic peptides.

Adams says that a common mechanism may underlie the protective action of the agents and that the body's defense system of macrophages

is intimately involved. In the future, the investigators plan to study the metabolism of the algal toxin and its effects in tissue culture systems, as well as the possibility of using the protective agents for modulating other cyclic peptides such as certain drugs and hormones.

Williams Adams received his M.D. from Ohio State University and interned at Bellevue Hospital, New York. He was a postgraduate student at the London School of Hygiene and Tropical Medicine, and a resident in medicine at Boston City Hospital. Adams saw active duty in Vietnam at U.S. Navy hospitals in Saigon and DaNang.

From 1971 to 1974 he was affiliated with Johns Hopkins University as a research associate, instructor and assistant professor. During this period, he spent two years doing medical research in Kathmandu, Nepal, and six months in Bangladesh. In 1975, Adams moved to Boston, where his research centered on sickle cell disease. Then, in 1979, he went to Texas Technical University, where he was Associate Professor of Medicine.

Adams joined the scientific staff of

BNL's Medical Department in 1981 and, in addition to his peptide research, is principal investigator of the Marshall Islands Study.

All those interested in getting together after the lecture are invited to go with the lecturer to a restaurant off site. If you want to be part of this group, call George Rabinowitz, Ext. 7637.

News Flash!

The Tandem/AGS Heavy Ion Project reached its first milestone on January 14: Beam was injected from the Tandem Van de Graaff into a part of the transfer line which leads to the Alternating Gradient Synchrotron. The section successfully activated was the area near the Tandem, where the beam makes a 180-degree turn into the transfer line tunnel on its way to the AGS. As expected, a beam spot about one millimeter in diameter was observed at the end of this section. Full commissioning is expected to start in February.



William Adams

Peter Horton

The Dream Lives On

Martin Luther King, who was born January 15, 1929, made many significant contributions to American civil rights. To honor his memory, we are presenting some highlights of his life, a bibliography of his writings and books written about his life and excerpts from his most famous speech, "I Have a Dream."

Martin Luther King Jr., civil rights activist and Nobel Peace laureate, was born in Atlanta, Georgia, to schoolteacher Alberta King, whose father was a Baptist preacher, and Martin Luther King Sr., also a Baptist minister. At the age of 15, the younger Martin Luther King entered Morehouse College in Atlanta. In 1947, he was licensed to preach and was ordained a Baptist minister in February 1948. That June, he received his A.B. degree.

King spent the next three years at Crozer Theological Seminary in Chester, Pa. There, he first became acquainted with Mahatma Ghandi's philosophy of nonviolence, which became his life-long guiding principle, and earned a Bachelor of Divinity degree in 1951. From Crozer, King went to Boston University to take a Ph.D. in Systematic Theology in 1955.

On December 1, 1955 in Montgomery, Alabama, Rosa Parks, a 42-year-old black seamstress, refused to give up her bus seat to a white man and was arrested for violating Montgomery's segregation law. King, who was the pastor of the Dexter Avenue Baptist Church in Montgomery at the time, was unanimously elected the leader of the Montgomery Improvement Association, a group of black activists. As a result of Parks's arrest, they organized the 382-day boycott of city buses that ended with the desegregation of Montgomery's transit system on December 21, 1956.

From 1960 to 1965, King's influence on the civil rights movement was at its peak. In 1960, he moved back to Atlanta to become copastor with his father of the Ebenezer Baptist Church. That October, he was jailed for protesting segregation at an Atlanta department store lunch counter. He was released only upon the inter-

"I Have a Dream"

... I have a dream today! I have a dream that one day "every valley shall be exalted and every hill and mountain shall be made low. The rough places will be made plain and the crooked places will be made straight, and the glory of the Lord shall be revealed, and all flesh shall see it together."

This is our hope. This is the faith that I go back to the South with. With this faith we shall be able to transform the jangling discords of our nation into a beautiful symphony of brotherhood. With this faith we will be able to work together, to pray together, to struggle together, to go to jail together, to stand up for freedom together, knowing that we will be free one day. And this will be the day. This will be the day when all of God's children will be able to sing with new meaning, "My country 'tis of thee, sweet land of liberty, of thee I sing. Land where my fathers died, land of the pilgrim's pride, from every mountain side, let freedom ring." And if America is to be a great nation, this must become true.

So let freedom ring from the prodigious hilltops of New Hampshire; let freedom ring from the mighty mountains of New York; let freedom ring from the heightening Alleghenies of Pennsylvania; let freedom ring from the snowcapped Rockies of Colorado; let freedom ring from the curvaceous slopes of California. But not only that. Let freedom ring from Stone Mountain of Georgia; let freedom ring from Lookout Mountain of Tennessee; let freedom ring from every hill and molehill of Mississippi. From every mountainside, let freedom ring.

And when this happens, and when we allow freedom to ring, when we let it ring from every village and every hamlet, from every state and every city, we will be able to speed up that day when all God's children, black men and white men, Jews and gentiles, Protestants and Catholics, will be able to join hands and sing in the words of the old Negro spiritual: "Free at last. Free at last. Thank God Almighty, we are free at last."

- Martin Luther King Jr.
August 28, 1963
Lincoln Memorial, Washington, D.C.

cession of Democratic presidential candidate John F. Kennedy.

In the spring of 1963 in Birmingham, Alabama, King was again jailed for protesting segregated lunch counters. On April 16, he wrote his famous "Letter from a Birmingham Jail" as a response to eight Alabama clergymen who called for an end to the civil rights demonstrations in Birmingham.

To dramatize to the nation and the world the importance of solving the U.S. civil rights problem, King helped organize the March on Washington of August 28, 1963. Over 200,000 people gathered by the Lincoln Memorial to demand equal rights for all citizens under the law. There King delivered his famous "I Have a Dream" speech.

As a result of the mass movement he created, Congress passed the Civil Rights Act of 1964, which outlaws discrimination in publically owned places and in employment. In July, King attended the signing of the Pub-

lic Accommodations Bill, a part of the Civil Rights Act, by President Johnson. On December 10 of that year, King received the Nobel Prize for Peace. King is also credited with enabling the passage of the Voting Rights Act of 1965 by his march from Selma, Alabama, to Montgomery, to demonstrate the need for a Federal law ensuring voting rights for all citizens.

After expanding his platform to include opposition to the war in Vietnam and support for the poor of all races, King interrupted his planning of a Poor People's March to Washington and went to Memphis, Tennessee to support a sanitation workers' strike. There on April 4, 1968, he was killed by a sniper's bullet while standing on the balcony of the motel where he was staying; James Earl Ray pleaded guilty to the murder and was sentenced to 99 years in prison.

King is remembered as a leader who was able to turn local protest into a



Martin Luther King Jr.

national crusade for civil rights. He demonstrated that grappling with the issues of freedom and justice was not just a legal struggle, but a moral struggle as well. King, who was 39 at his death, said prophetically in his last address the day before his murder, "I've been to the mountaintop . . . I may not get to the promised land with you, but I want you to know tonight that we as a people will."

To better understand King's life, philosophy and impact, here are some titles of books that might be useful:

- Stride Toward Freedom: the Montgomery Story*, by Martin Luther King, Jr., 1958.
- Strength to Love*, by Martin Luther King, Jr., 1963.
- Why We Can't Wait*, by Martin Luther King, Jr., 1964.
- Where Do We Go From Here: Chaos or Community?*, by Martin Luther King, Jr., 1968.
- Crusader Without Violence*, by Lawrence Dunbar Reddick, 1959.
- My Life with Martin Luther King, Jr.*, by Coretta Scott King, 1969.
- King: A Critical Biography*, by David L. Lewis, 1970.
- Let the Trumpet Sound: The Life of Martin Luther King, Jr.*, by Stephen B. Oates, 1982.
- Martin Luther King, Jr.: A Profile*, edited by C. Eric Lincoln, 1984.

Another Force (Cont'd)

prised to see the effects so clearly."

The original experiment compared the acceleration of various materials at the surface of the Earth, thereby testing whether their inertial masses were indeed proportional to their gravitational masses. These masses were compared in a series of instances when two samples of different composition (such as water and copper, or copper and asbestos) were suspended from a torsion balance.

Since the Eötvös experiment was reported, in 1922, after Eötvös himself had died, physicists have considered it confirmation of Galileo's early 17th-century finding. Later that century, Sir Isaac Newton used Galileo's principle in his formulation of the theory of gravity. Albert Einstein's general theory of relativity also assumes that all bodies fall at the same rate in a uniform gravitational field. But Aronson and Fischbach's reexamination of the Eötvös data indicates that this may not be true, thanks to the perturbation of the hypercharge.

The hypercharge of an ordinary object is equal to the number of neutrons and protons in the nuclei of its atoms, a quantity known as its baryon number. Different elements have different ratios of baryon number to mass of the nucleus. Therefore, a hypercharge force will affect different materials differently, relative to gravity. To be consistent with other observations, this force would have a range of a few meters to a few thousand

meters, and so would have no measurable effects on a solar scale and, thus, would not affect the predictions of the general theory of relativity.

But if this range of force is correct, the force's effects, while minute, are measurable on Earth. Said Aronson, "When we plotted the Eötvös findings against what we consider the important parameter, we found a striking linear relationship." This led Aronson and Fischbach to speculate about the hypercharge.

The Next Step

Now, as Goldhaber has pointed out, the concept of the hypercharge must be tested further. In the Physical Review Letters article, Aronson and Fischbach suggest several direct tests. "To start with," they write, "the Eötvös experiment itself should be repeated with greater sensitivity, and with a variety of materials whose precise composition is known." According to White, "If someone were in the business of gravity measurement, it would be relatively straightforward to attempt to repeat the Eötvös experiment, and it could be done within a year."

The authors also suggest, "...it may be more practical simply to compare the times of flight of different test masses dropped from the same height, in an updated version of the Galileo experiment." In fact, a former student of Fischbach's is thinking of doing that. In his legendary test, Galileo supposedly dropped cannon balls of different sizes from the Leaning Tower of Pisa, but in order to see the effects

of the hypercharge, he would have had to make measurements to the order of a nanosecond. This kind of precision should be possible today.

Another approach, the article suggests, might be to improve measurements of differences between locally measured values of gravity, such as those measured in the Australian mines, and that implied by satellite data.

Finally, the authors suggest a search for the particle that would have to mediate the new force. As photons carry the electromagnetic force, hyperphotons would mediate the hypercharge. Individually, these particles would have almost no mass. But collectively, the article points out, "From a cosmological point of view, hyperphotons would act as a massive but very weakly interacting constituent of interstellar space, and could thus help account for the missing mass of the Universe."

Such a particle, said Aronson, might be found in a particular decay mode of the K meson, when it would decay into a pi meson and a hyperphoton. Adding that he and Fischbach had just drafted a paper proposing such a search, Aronson said "The rare kaon decay experiment that a group headed by Ted Kycia will begin next fall at BNL is an ideal set up for possibly observing this kind of particle."

Until the collaborators decide their next step in this area of research, Aronson has plenty to do. He has just begun a six-month stay at CERN, the European high energy physics labor-

atory, where he is working with Bill Willis on advanced accelerator design ideas. Not only is he on leave from his BNL assignment, but also from his role in the D0 experiment being constructed at the new Tevatron collider at Fermilab.

Actually, he said of his collaboration with Fischbach, "It has never been the thing I have been 'officially' doing. But we think it's important. It's fun and exciting, and we'll continue to do it on an informal basis. If things accelerate, and if it really has some lasting impact on physics, I will devote more time to it. I do think it's one of the most important things I have had the privilege of working on, and it will give me a great deal of pleasure to see other people begin working on this subject."

— Anita Cohen

To Your Health

On Tuesday, January 21, the third Health Promotion Seminar will be held to discuss "Becoming an Educated Health Consumer: Over-the-Counter and Prescription Drugs." The speaker will be Tim Mirando, who is the Assistant Director for Drug Information and Education at University Hospital, Department of Pharmacy, SUNY at Stony Brook. Mirando, who holds a master's degree, will discuss the actions and interactions of common medications.

BROOKHAVEN BULLETIN

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AMD Courses

Overview of RDB, 4GL and R5K

10:30 a.m. to noon, Wednesday, January 29, February 5 and 12, AMD Seminar Room, Building 515. Lecturer: K. Fuchel.

A three session course covering relational data bases, fourth generation languages and application generators will be offered to the user community. Examples will be provided using R:Base 5000 and SIR. The use of these modern tools has been shown to increase productivity in applications development by as much as a factor of 20.

Introduction to Programming with Pascal.

12 - 1 1/2 hour sessions 10:30 a.m. to noon, Tuesday and Thursday, February 4 and 6, 11 and 13, 25 and 27, March 4 and 6, 11 and 13, 18 and 20, AMD Building 515. Lecturer: M. Strongson.

Pascal is a data-structure oriented, modern, general purpose language. It is modeled after ALGOL-60 and is an efficient tool for writing general or specific, large or small programs. The course will include the full range of the language. Course topics include: introduction to computers, algorithm creation, top down design, elementary Pascal concepts, selection and looping, procedures and functions, data types and arrays, and pointers and records.

Note: Supervisory approval is required for this course.

To register, or for more information, call Ronald Wittlock at Ext. 4112.

Visual Aids Workshop

Those who give technical presentations, using the overhead projector, will be interested in this lunch time mini-workshop.

Communications Consultant Merna Skinner of Exec Comm will provide useful tips, video taped demonstrations and practice in the effective use of visual aids. According to Skinner, the overhead projector is the most frequently used visual equipment, and the one most often used to disadvantage, even by accomplished presenters.

Join Skinner for lunch on Wednesday, January 29 in Berkner Hall, Room B, from noon until 1:00 p.m. Bring your lunch. Coffee and soft drinks will be provided. You may also wish to bring some of your own viewgraphs for professional evaluation. Please notify Mary White at Ext. 7994 by Friday, January 25, if you plan to attend.

Re: Generator Distribution

- If you are scheduled to pick up your generator tomorrow, be sure to arrive at your appointed time. If you come early, you will just have to wait. If you come late, you will go to the end of the list.

- More volunteers are needed to help with tomorrow's distribution. Call Ray Lo Presti, Ext. 5042.

Weight Watchers Organize at BNL

If you have put off your New Year's resolution to lose weight, delay no longer. Weight Watchers, the international diet and support group, is coming to BNL. On Tuesday, January 28, from noon to 1 p.m. in Berkner Auditorium, an informational meeting and registration for the first eight-week session at BNL will take place.

Weight Watcher meetings will be held on eight consecutive Tuesdays from 5:15 p.m. to 6:15 p.m., beginning Tuesday, February 11. Those who sign up must be committed to attending all eight sessions. Participation is limited to 35 employees, but additional sessions will be arranged according to need.

Registration costs \$10. Checks must be made payable to Weight Watchers and will be accepted at the informational meeting on January 28. To encourage participation, the Laboratory is paying the remainder of the fee, which is \$48 per person. If you cannot attend the registration meeting, Health Promotion Specialist Elaine Friedman, who organized this program, will accept registrations mailed to her at the Medical Department, Bldg. 490, if space is still available.

Fourteen million people have attended Weight Watchers since its founding by Jean Nidetch in 1963. The program begins with a Quick-Start diet, which is designed for initial rapid weight loss. The Quick-Start and regular Weight Watchers diets are designed using a food-exchange system. Foods are grouped as fruit, vegetable, milk, bread, fat and protein categories or exchanges. All selections within an exchange are about equal in calories and nutritional value.

A meal consists of a certain number of exchanges, and within each exchange, you choose the food you want to eat. You must eat three meals a day and are allowed two snacks. The diet includes potatoes, rice and pasta, as well as allowing up to three glasses of wine a week. In the beginning of Weight Watchers, you are supposed to weigh or measure your portions.

At the eight Tuesday meetings, you will be privately weighed by a Weight Watchers staff member; no judgmental remarks about the week's gains or losses will be made. The hour-long meeting will offer advice on nutrition, help in changing to healthier eating habits and a supportive and sympathetic group.

Gospel Extravaganza Coming Up!

The Afro-American Culture Club will present the 5th Annual Gospel Extravaganza on Saturday, February 1 at 7 p.m. Featured will be a group called the Voices of Women Victorious from Cambridge Mass. They will be joined by the Male Chorus, Cutchogue, N.Y.; Southern Harmonizers, Wyandanch, N.Y.; Bridgehampton Mass Choir, Bridgehampton, N.Y.; and Christ Baptist Youth Choir, Coram, N.Y. Tickets are \$8 in advance, \$10 at the door. Ticket sellers are:

	Ext.	Bldg.
Frances Ligon	3709	460
Sandra Dozier	4933	535A
BERA Film Service	3347	Berkner
Rosa Palmore	2064	475
Kay Hunt	2882	185

In case the weather is bad, a snow-date has been arranged for February 8.

BERA Board Names Committee

A nominating committee has been appointed by the BERA Executive Board to select a slate of candidates for the 1986 BERA Board election scheduled to be held during the month of March. Committee members are:

Richard Adams	Ext. 4060
Bonnie Biittner	4525
Otto Jacobi	4428
Barry Karlin	5624
Sandi Lane	7159
Rosalie Piccione	3160
James Roesler	5051
Edward Schwaner	4846
Barbara Simpson	7009
Doris Terry	7610

Any employee who wishes to propose a name for nomination may do so by contacting a member of the nominating committee by Wednesday, February 12. Please make certain the person being proposed will agree to accept the nomination if selected.

Arrivals & Departures

Arrivals	
Thomas A. Belz	Central Shops
RoseMarie Cannella	Budget Ofc.
William H. Schmidt	Plant Eng.
Lynne S. Warkentien	Medical
Departures	
None	

Swim Club

At the Southern Connecticut Mid-Winter Invitational on Saturday, January 11, in New Haven, the BNL Swim Team took third place in a 200-yard men's medley relay in a time of 2:10.48. Peter Cameron started the relay, swimming 50-yards of backstroke in 38.61. Next off the block was Pavel Rehak, who swam the breaststroke in 36.20. Butterflyer Peter Heotis completed the third leg in 27.37. Mark Catan brought the relay home with a freestyle time of 28.30.

The Swim Team also brought home nine additional ribbons for age-group finishes at their third U.S. Masters event of the indoor season. In addition to his relay showing, Rehak earned the most ribbons for BNL by placing second of men 40 to 44 years in the 50, 100 and 200-yard breaststroke, with times of 36.58, 1:21.91 and 3:04.33 respectively.

Second in the ribbon count was Heotis, with a second in the 100-yard freestyle among men 35 to 39 in 57.02 and a second in the 50-yard butterfly in 28.16. He also finished fourth in the 100-yard individual medley in 1:08.16. Cameron also swam the 200-yard breaststroke in 3:01.86 to finish third among men 35 to 39 years.

Carrie Grimshaw placed third among women 20 to 24 years in the 50-yard breaststroke in a time of 51.27. Jose Pires completed the 50-yard freestyle in 32.18 and the 100-yard freestyle in 1:13.97, to place seventh and fifth, respectively, among 30 to 34-year-old men. Catan also swam those events: among men 25 to 29, he finished ninth in the 50-yard freestyle in 28.01 and thirteenth in the 100-yard freestyle in 1:02.79.

Basketball

Game 1	
Hollywood - 51	Runaway - 39
G. Mack	6 J. Shepherd
R. Domenech	2 J. Desmond
E. Meier Jr.	20 A. Stillman
D. Nordstrom	21 J. Ripka
B. Gunther	2 R. Moran
	6 G. Smith
	8

Game 2	
Coasters - 75	Longshots - 66
R. Doty	26 J. Gaeta
B. Allen	30 L. Walcott
P. Ratzke	2 G. Griggs
M. Williams	5 B. Johnson
B. Leroy	2 M. Colon
R. Rowley	6 A. Anderson
H. Bell	4 L. James
	9

Cafeteria Menu

Week of January 20

Monday, January 20	
Cream of chicken soup	(cup) .65
	(bowl) .85
Pepper steak over rice	2.45
Veal Parmesan	2.45
Hot Deli: Seafood croissant	2.40
Tuesday, January 21	
Turkey noodle soup	(cup) .65
	(bowl) .85
Veal cordon bleu	2.45
Seafood Newburg over rice	2.45
Hot Deli: Italian sausage hero	2.40
Wednesday, January 22	
Rhode Island broth chowder	(cup) .65
	(bowl) .85
Broiled filet of sole	2.45
Polish style stuffed green peppers	2.45
Hot Deli: Tuna cheddar melt	2.35
Indoor Picnic Day	
See our special picnic buffet each Wednesday in January	
Thursday, January 23	
Chicken gumbo	(cup) .65
	(bowl) .85
Salisbury steak	2.45
Shrimp Oriental	2.45
Hot Deli: Bacon, lettuce & tomato croissant	2.25
Friday, January 24	
Seafood gumbo	(cup) .65
	(bowl) .85
Broiled flank steak carved to order	2.45
Beef pot pie	2.45
Hot Deli: Denver sandwich on onion roll	2.25

Aerobic Dance

There is still room for more participants in the current exercise sessions sponsored by the Aerobic Dance Club. Classes in aerobic dance are held on Tuesdays and Thursdays, and stretch classes are held on Wednesdays. All classes run from 5:15 to 6:15 p.m. For more information call Anita Cohen, Ext. 5054, or Bill Leonhardt, Ext. 2378.

Cooking Exchange

At the Cooking Exchange meeting on Wednesday, January 22, a variety of recipes, "low budget but good," will be demonstrated by members from five countries: Israel, Japan, Poland, Switzerland and U.S.A.

Exchange meetings are held in the Recreation Building on the second and fourth Wednesday of each month from 12:30 to 2:30 p.m. A \$1.25 donation entitles those present to a copy of the day's recipes, samples of the prepared dishes and coffee and tea. Baby sitting is provided at 50¢ for each child.

For more information, call Susan Sears, 744-7831; Sara Morse, 286-1712; or Madoka Mlake, 282-3131.

Bowling

Purple League

High games were bowled by Ken Asselta 212, Sandy Asselta 206, Ed Sperry 204, Lee Barberich 200, Joe Sheehan 198, Joyce Pinelli 170/168, Mary Grace Meier 170.

Red/Green League

H. Arnesen had games of 234/223 for a 643 scratch series, R. Larsen 227, R. Jones 227, E. Sperry IV 214/607 scratch, K. Riker 208.

White League

Paul Callegari rolled a 212, Jim Vogel 212, Ken Riker 203/202, Jim Roesler 197, Nancy Erickson 177, Kathy Griffin 168, Mary Scheidet 165. The Easy Pick-ups edged out the Good Guys by one half point to become the first half winners.

Concert Reminder

Violinist Nai-Yuan Hu, winner of the Queen Elisabeth International Music Competition of Belgium, will give a concert at Berkner Hall on Thursday, January 23, at 8:30 p.m. Tickets are \$5 and are available at the door.

