



(Right rear) Prantika Som, (left) Donald Sacker and Zvi Oster analyze a computer image of thrombi in the lungs.

Alex Reben

Monoclonal Antibodies Used to Detect Blood Clots

Soon, the diagnosis of a blood clot may be made early enough to save more patients' lives if the thrombi detection methods of Scientist Prantika Som and Research Collaborator Zvi Oster succeed in human beings. Som and Oster were the first to locate thrombi in dogs using monoclonal antiplatelet antibodies. Clinical trials will soon begin to see if these antibodies can find blood clots in human patients.

Thrombi, blood clots occurring on damaged walls of blood vessels, are the cause or by-product of many human diseases. Thrombi can cause heart attacks by blocking the arteries feeding the heart. Blood clots can impair limb circulation; those in leg veins often dislodge, and the resulting emboli are carried by the blood to the lungs. Tumors often cause abnormal clots, and abnormal clot formation often plays a role in the rejection of transplanted organs.

Som, a veterinarian in the Medical Department, and Oster, a physician in the Radiology Department at the State University of New York at Stony Brook, have developed two methods using antiplatelet antibodies to detect thrombi in the limbs and chest, including the coronary arteries. They were assisted in their work by Medical Associate Donald Sacker.

One method uses the entire antiplatelet antibody labeled with radioactive indium or iodine to locate thrombi. The other technique utilizes a fragment of another antibody tagged with the radionuclide technetium-99m.

Antibodies are proteins found mostly in the blood that are produced by certain white blood cells in response to the presence of foreign substances in the body. Antibodies combine with foreign substances to neutralize or eliminate them. Apart from their natural function, antibodies are used as a tool to identify

particular molecules or cells in the body.

Unlike conventional antibodies, monoclonal antibodies against a specific substance are identical molecules derived from a single white blood cell and are made in the laboratory. The monoclonal antiplatelet antibody used by Som and Oster reacts specifically against platelets, little disks normally found in the blood. Since antibody-producing cells cannot be grown in culture, the monoclonal antiplatelet antibody was produced by exposing mice to human platelets, fusing the resulting white blood cells to immune-system tumor cells and cloning these hybrid cells.

The monoclonal antibody against platelets, called 7E3, was first isolated by Hematologist Barry Collier of SUNY at Stony Brook. He uses it to test the blood of relatives of patients with Glanzmann's thrombasthenia, a disorder of blood platelets that causes hemophilia-like symptoms, to see if they are carriers of that disease.

Because thrombi contain many platelets, it was thought that Collier's antiplatelet antibody would be ideal to locate thrombi. Though the antibodies are against human platelets, they cross react with dog platelets, so dogs were used for preclinical evaluation.

These antibodies were made radioactive, so thrombi could then be seen with a gamma camera once the antiplatelet antibodies located and reacted with them. Labeling Collier's antiplatelet antibodies with radionuclides was accomplished by Suresh Srivastava, head of BNL's Radionuclide & Radiopharmaceutical Research Division of the Medical Department, and Chemistry Associate George Meinken using indium-111 and iodine-123.

The present clot-detecting test in nuclear medicine is to use platelets
(Continued on page 2)

Peter Rathvon Dies

N. Peter Rathvon Jr., Secretary and General Counsel of Associated Universities, Inc. (AUI), at BNL, died of a massive cerebral hemorrhage on August 9 in Kiev, U.S.S.R. Rathvon was participating in a Goodwill People-to-People Delegation tour of the U.S.S.R. and China. He was 64 years old.

Rathvon had been associated with AUI since 1956 and was stationed at the Laboratory. Before coming to Brookhaven, he had been with the legal firm of Milbank, Tweed, Hadley & McCloy in New York from 1948 to 1956. He served in the U. S. Navy from 1942 to 1946. He was a graduate of the Cornell Law School.

On learning of his death, Robert E. Hughes, President of AUI, said, "For almost 30 years Peter Rathvon devoted his professional life to AUI, Brookhaven and NRAO. A wise and gentle man with a fine, quick mind, he earned the respect of all of his associates. He will be sorely missed."

Laboratory Director Nicholas P. Samios added, "Peter not only provided sage legal advice to AUI and Brookhaven, but was an invaluable source of institutional memory to all of us. Another link with our past has been broken."

Rathvon was born in Yonkers, New York, and at the age of four months was taken to Peking (Beijing) China, where he lived for the next year and a half. He grew up in New Rochelle, New York and attended the Rye Country Day School and the Choate School.

He was a member of the American Bar Association, Suffolk County Bar Association and the Society of Hospital Attorneys. He was a member of the Human Subjects Research Subcommittee at the VA Hospital, Northport, a member of the Human Subjects Review Committee at the Lab, and on



Peter Rathvon

the Board of Governors of the BNL Hospital.

Rathvon was a resident of Setauket and was a charter member of the Three Village Tennis Club and the Carriage House Players. He was on the first Board of Gallery North and started a chess club in the Setauket Jr. High School. For many years, he was a coach in the Little League.

He is survived by his wife, Sally; a daughter Laraine House, Bethesda, Md.; two sons, Henry of Croton-on-Hudson, N.Y., and James of Washington, D.C.; two grandchildren; and two sisters, Joan Wilson, Bethesda, Md., and Judith Plowdon, Los Angeles, Ca.

A memorial service will be held at noon on Saturday, August 24 in Berkner Hall.

In lieu of flowers, the family asks that donations be sent to The Ministries, 2229 Rte. 112, Coram, New York 11727.

BNL and Industry Exchange Technology

Two scientists from private industry will be coming to Brookhaven as research fellows under a new DOE-Industry Technology Exchange Research Program. The new program was recently announced by Secretary of Energy John S. Herrington.

Said Herrington, "The program is intended to improve relations between the laboratories and the private sector and to promote technology transfer from the laboratories to industry. This program reflects our continued commitment to make the unique resources of our national laboratories available, as appropriate, to industry."

All told, seven Department of Energy laboratories, including Brookhaven Lab, will host 12 research fellows, for appointments ranging up to two years. Coming to Brookhaven are Roderick Dayton, from Bicon Corporation in Newbury, Ohio; and Eiji Inuzaka, from INSPEX-Hamamatsu in Waltham, Massachusetts. Both will be working with scientists here on projects that have potential applications for, among other things, medical diagnostic tools.

The cooperative research with Bicon will involve BNL's Andrew Sandorfi and David Dowell, in the Laser Electron Gamma Source Group of the Physics Department. Sandorfi and Dowell will be working with

Bicon to develop a new technique for processing large ingots of sodium iodide. Crystals cut from these ingots are used extensively for scientific and medical applications. For example, they form the "cameras" used to do CAT scans in cancer treatment. The new processing technique was originally developed at Brookhaven for a very large sodium iodide crystal that will be used as a detector for physics experiments.

The program with INSPEX-Hamamatsu involves a device developed by Hamamatsu for astronomical observations. In cooperation with the BNL Medical Department's Nuclear Medicine Division, under A. Bertrand Brill, the device will be adapted for use in nuclear medicine imaging. Potential applications for such a device include imaging the distribution of various iodine-125 radiopharmaceuticals, reconstructing images of body organs of different densities and high resolution imaging of small parts of the body, like fingers.

The Technology Exchange Research Program is funded by DOE's Office of Energy Research, which also reviewed candidates nominated by their companies and by the laboratories. DOE and the companies will share participants' salaries and relocation expenses.

Blood Clots (Continued)

themselves labeled with indium-111. This involves drawing about 80 milliliters of the blood of a patient who is suspected of having a thrombus, separating the platelets from the blood, labeling the platelets with indium-111 and reinjecting them into the patient.

The biggest drawback to this practice is that visualizing thrombi takes 24 to 48 hours after the labeled platelets are reinjected into the patient. "While waiting for the results from this method, the patients might die from the obstruction of their blood vessels," says Oster.

Oster and Som found that using antiplatelet antibodies labeled with indium-111 or iodine-123 has advan-

tages over the present practice. The greatest advantage is that thrombi can be seen as early as one to 1 1/2 hours after injection.

A former colleague of Som and Oster's from their days at Johns Hopkins University, Radiopharmacologist Buck Rhodes, senior vice president of the Summa Medical Corporation, Albuquerque, New Mexico, suggested that they substitute a fragment of another antiplatelet antibody, called 50H.19. The antibody has a Y-shaped structure, and the fragment they use is the arm of the antibody containing the information that causes it to locate platelets. It is labeled with technetium-99m. Som and Oster found the fragment to have the advantage that it clears from the blood more rapidly than the whole antibody, resulting in clearer visualization of the clot because of the lower background radioactivity in the blood.

"The next preclinical study we will do is to try to determine the age of the clots we can detect," says Som. So far, with the whole antibody, they have detected clots up to ten hours old, and using the fragment, clots up to six hours old can be seen. Within six hours of the beginning of a clot, tissue can be saved and further damage prevented using clot-dissolving drugs. Therefore, the earlier the clot can be seen, the better.

"Another study we will undertake is to see how drugs used to prevent clot formation, such as aspirin and heparin, affect our results," adds Som.

— Marsha Belford



Thrombi in the lungs as seen after injection of labeled monoclonal antiplatelet antibodies.

Reports Available

The following reports are now available to the Laboratory staff and to affiliates of the DOE, AUI and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Dept. of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. Staff members should call Ext. 5068.

NUREG/CR-2331
BNL-NUREG-51454

Vol. 4 #3
Safety Research Programs Sponsored by Office of Nuclear Regulatory Research. Quarterly Progress Report July 1 - Sept. 30, 1984. Compiled by A.J. Weiss

NUREG/CR-2482
BNL-NUREG-51494

Vol. 6
Review of DOE Waste Package Program. Subtask 1.1 — National Waste Package Program Oct. 1983 - Mar. 1984. Prepared by P. Soo, Editor

NUREG/CR-2481
BNL-NUREG-51494

Vol. 7
Review of DOE Waste Package Program. Subtask 1.1 — National Waste Package Program April 1984 - Sept. 1984. Prepared by P. Soo, Editor

BNL-51749

Coal Fracturing and Heteroatom Removal. Annual Report — Fiscal Year 1983. R. Sapienza, et al

NUREG/CR-3703
BNL-NUREG-51750

Assessment of Selected TRAC and RELAP5 Calculations for OCONEE-1 Pressurized Thermal Shock Study. U.S. Rohatgi, et al

BNL-51840

NLS Annual Report — 1984. W. Thomlinson, R. Klaffky, Editors

NUREG/CR-4068
BNL-NUREG-51843

Summary of Historical Experience with Releases of Radioactive Materials from Commercial Nuclear Power Plants in the United States. V.L. Sailor, J.J. Colbert

NUREG/CR-4083
BNL-NUREG-51846

Analyses of Soils from the Low-Level Radioactive Waste Disposal Sites at Barnwell, SC, and Richland, WA. Prepared by P.L. Piciulo, C.E. Shea, R.E. Barletta

BNL-51864

Heat/Mass Flow Enhancement Design for a Metal Hydride Assembly. Final Report. Southern California Gas Co.

Vets Honor Harson

Louis Harson has two jobs at the Lab; officially, he is Principal Architect in Plant Engineering and, unofficially, Camp Upton Historian. For the last 20 years Harson has carefully assembled memorabilia from many sources to preserve the history of the Lab site from the time when it was known as Camp Upton. On July 28 at the last meeting of Veterans of World War I Patchogue Barracks No. 2981, he was recognized by a number of organizations for his "untiring efforts on behalf of the veterans of World War I." Particular reference was made to his valuable assistance on the installation of memorial plaques and roadside markers, and the establishment of the Camp Upton Museum at the BNL Exhibit Center.

Citations were presented to him by the Veterans of World War I of the U.S.A., Department of New York, Inc.; The American Legion Hand-Aldrich Post 924, Inc., Hampton Bays, New York; The Combined Veterans Organization of Southampton, New York, American Legion, VFW, Polish



Lou Harson is congratulated by Michael Fitzpatrick, Special Projects Coordinator for Congressman William Carney.

Veterans; and the 77th Division Association, Inc. He was also given a New York State Assembly Citation signed by Assembly Member John L. Behan (2nd A.D.) and a Congressional Proclamation signed by William Carney, Member of Congress (1st C.D.).

Inside Info

Richard Setlow, chairman of the Biology Department, was taught cardiopulmonary resuscitation (CPR) at the Lab and, in fact, was recently recertified. Two weeks ago his skill was called into play. He was at the movies when a man had a heart attack. Setlow began chest compressions and another movie patron, a physician, gave mouth-to-mouth resuscitation. Together they and another person worked on the patient until the ambulance arrived.

Jeanne Wysocki, a research associate in Biology, is an Advanced Emergency Medical Technician and it is she who taught Setlow. It is due to her enthusiastic efforts as a volunteer CPR instructor that one-third of the Biology personnel is certified in CPR.

Arrivals & Departures

Arrivals

Stephen Kulba Plant Eng.
Dana S. Sells Plant Eng.

Departures

This list includes all employees who have terminated from the Laboratory, including retirees:

Bruce J. Dionne S&EP
Norene G. Lucas NLS
Thomas L. Netzel Chemistry

Patent Awarded

Eric B. Forsyth and Albert C. Muller, both in the AGS Department, were issued U.S. Patent #4,487,991 for developing a high voltage oil-impregnated electrical cable with polymer tape insulation. The cable can operate to 765 kilovolts. (See Bulletin story July 19, 1985.)

Traditional methods of construction for high voltage cables, those using kraft paper insulation and oil impregnation, appear to have reached their practical limit with respect to voltage and, therefore, power. The logical progression of cable technology has been toward all plastic insulation for high voltage cables, and several versions have been patented and constructed in limited quantity.

In this invention, the superior electrical properties of polyethylene, polybutene or polypropylene tape are combined with conventional impregnating fluids in a cable that could have long life and reliability, as well as higher voltage and higher current capabilities than paper-insulated cables. The cable can be impregnated with oil after field installation.

If you haven't signed up your child for nursery school, you may not be too late. Upton Nursery School for three- and four-year-olds begins in September, but there may be space left. Call Joan Rice at 924-8880 to register.

Workshop Zeros In

At the Second Annual D0 Collaboration Workshop held last week, about 100 collaborators from 17 institutions met at the Lab to agree on construction details regarding the D0 detector planned for Fermilab's Tevatron collider. Details such as the thickness of uranium plates and the argon gaps for a calorimeter, and the organization of the computer software were decided from Monday, August 5, through Friday, August 9. Seven BNL physicists are working on a uranium liquid argon calorimeter and the computer software for D0.

The D0 detector will be located at the Tevatron I collider at Fermi National Accelerator Laboratory. When Tevatron's two beams collide, the energy at the center of mass will be two trillion electron volts. The D0 detector is designed to take advantage of this high energy and will look for "new phenomena beyond W and Z particles — perhaps heavier quarks," explains Physicist Howard Gordon, head of the Physics Department's Omega Group. "We'll be searching for an explanation of particle mass. Many possibilities have been proposed theoretically, such as technicolor and supersymmetry, but the answer must be found experimentally." The detector should begin operating in 1989 and is primarily funded by the U.S. Department of Energy.

D0 will be composed of a tracking detector, a calorimeter and a muon detector. A full-scale, aluminum mock-up of half of the 16-foot-tall and ten-foot-wide, donut-shaped calorimeter built on the second floor of BNL's Physics Department was on display during the workshop. It will be used to learn how to route the calorimeter's electronic cables and to test the calorimeter modules.

According to Paul Grannis, a physicist from SUNY at Stony Brook who heads the D0 project, the next step is the building of a prototype of the calorimeter at BNL. The conference was organized by Rae Greenberg of the Physics Department.



Pictured alongside "Aluminum Heights," the mock-up of the D0 calorimeter, are (from left) Sam Aronson, BNL; George Theodosiou, University of Pennsylvania; Carole Escobar, a Bellport High School physics teacher and BNL collaborator; Bruce Gibbard, BNL; (seated, below) Michael Masterson, a summer student and junior physics major at Michigan State University; (seated, above) Paul Grannis, SUNY at Stony Brook; Howard Gordon, BNL; and Peter Yamin, BNL. Grannis is holding a printed circuit readout board, which is used in tests of the calorimeter.

BROOKHAVEN BULLETIN

Published weekly for the employees of BROOKHAVEN NATIONAL LABORATORY

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Met Opera Season

Family Circle ticket prices: Tuesday and Friday evening performances, \$14.50; Saturday evening performances, \$15.50.

September	
Tuesday 24	Jenufa
Friday 27	Der Rosenkavalier
Saturday 28	Falstaff
October	
Saturday 19	Khovanshchina
Tuesday 29	Khovanshchina
November	
Friday 8	Cavalleria/Pagliacci
Saturday 23	Cavalleria/Pagliacci
Tuesday 26	Porgy and Bess
December	
Friday 13	L'Italiana in Algeri
Friday 27	Le Nozze di Figaro
Saturday 28	Parade
January	
Friday 17	Idomeneo
Tuesday 21	Romeo et Juliette
Saturday 25	Tosca
February	
Saturday 15	Samson
Friday 21	Simon Boccanegra
Tuesday 25	Francesca da Rimini
March	
Saturday 8	Francesca da Rimini
Tuesday 11	Falstaff
Friday 14	Carmen
Tuesday 25	Aida
April	
Friday 4	Don Carlo
Saturday 12	La Traviata
Saturday 26	Don Carlo
Tuesday 29	Carmen

Check this listing and watch the Bulletin for the first day of ticket sales.

Earthling Contacts Ham-in-Space, Part II

For his vacation during the last days of July and the first ones of August, Andy Feldman, Contracts & Procurement, was working the Space Shuttle Challenger. Working, in the jargon of amateur radio operators, means to attempt to contact another party. This was the second space shuttle mission to include a ham radio operator, and for the second time, Feldman made two-way contact with a NASA ham-in-space.

On Sunday, August 4, at 3:13 and 3:16 p.m. while Challenger traveled over the continental United States on a ground track from the southwest to the northeast during orbit number 78, Feldman broadcast his call letters WB2FXN into space from the spare bedroom of his Port Jefferson Station home. Between each broadcast, Astronaut Tony England, aka WOORE, responded, "I read you loud and clear." England was on board the Space Shuttle Challenger during its 51-F mission, which lasted from Monday, July 29, through Tuesday, August 6. On the tape Feldman made of this exchange, the astronaut, though he is 235 miles away, sounds louder and clearer than the earthbound ham.

Says Feldman, "I am anxiously waiting to receive confirmation of our contact." By transcribing the tapes England made of his conversations over his amateur radio, NASA and the American Radio Relay League are making a list of all those who contacted England in space, and England will send a "QSL" postcard confirming the contact to each one.

As one of 40 confirmed contacts, Feldman received a QSL card from Mission-specialist Owen Garriott, the first ham-in-space. Garriott flew aboard Columbia's mission at the end of 1983 and used his amateur radio to prove its reliability as a backup to the shuttle's communication system.

On Challenger's last mission, Astronaut England and Astronaut John David Bartoe, aka W4NYZ, were sent into space with Garriott's modified two-meter, hand-held FM radio capable of five-watt output and loop antenna mounted in one of the spacecraft's rear windows. They were per-



Andy Feldman and a slow scan TV picture of Astronaut Tony England.

mitted to use the system during their off hours, primarily to communicate with youth groups, especially those involved with the White House's Young Astronaut Program. Any additional spare time was used for two-way call sign exchanges with the average ham, as Feldman calls himself.

Space shuttle mission 51F was originally scheduled for lift off on July 12, but at T minus three seconds it was aborted because an engine malfunctioned. "They conveniently postponed the launch until the second week of my vacation," jokes Feldman. "Much to the chagrin of my family, I spent about four hours a day in my ham shack during the mission."

His successful two-way contact with the first ham-in-space inspired Feldman to upgrade his equipment in preparation for future missions. "Since the last mission, I spent dollars — I don't want to quote a figure because I don't want to think about how much I've spent."

His \$7 homemade, hand-adjustable, backyard antenna was replaced by a \$400 commercially made, motorized, roof-top antenna, which he controls with his home computer. His new

antenna increased his power 20 fold, and with an effective 2,000 watts from his transmitter and new antenna combination, Feldman has enough power to overcome any interference.

To determine the exact location of the shuttle, Feldman used his radio to hook up to NASA's tracking data and relay satellite system (TDROS) used by ground control. "I took orbital data, fed it to the computer, let the computer find the shuttle and track it across the sky," explains Feldman. As president of the Radio Central Amateur Radio Club of Rocky Point, Feldman shared his data with the club and in turn with hams from four other states.

Since the shuttle was overhead most afternoons, Feldman's computer also revealed which days and where in the sky the shuttle could be seen by the eye. "During dusk flights, you could see the shuttle right overhead — it was so brilliant, like a fireball, bigger and brighter than the planet Venus. You knew it wasn't a star or planet because it was moving at five miles a second." While Feldman was shuttle watching, he let his computer run the radio station.

Feldman's portable tape recorder, used to record all radio contacts, was augmented by a slow scan converter and a video monitor. The shuttle astronauts took pictures using a video camera with a slow scan converter and transmitted the composite picture to earth using the ham radio. The audio tape of the TV signals reminds one of the sounds from Sputnik: the tweeting of an ethereal, electronic bird.

Feldman received, taped and converted into pictures four sets of these signals: Tony England looking out of the experimental bay window; England by the co-pilot's chair looking out of the front windows; a view from the rear experimental compartment looking towards the tail; and an upside down view of the United Kingdom from the upper windows.

Feldman is already gathering flight data for the next shuttle mission. Says Feldman, "I have my reputation for having worked all space shuttle missions to keep up."

Cafeteria Menu

Week Ending August 23

Monday, August 19	
Cream of mushroom soup	(cup) .65 (bowl) .85
Beef pot pie & 1 veg.	2.20
Veal Madeline & 1 veg.	2.35
Hot Deli: Turkey breast	(bread) 2.15 (roll) 2.35
Tuesday, August 20	
U.S. Senate bean soup	(cup) .65 (bowl) .85
Barbecue spare ribs & 1 veg	2.25
Southern fried chicken w/ 1 veg. & cranberry sauce	2.25
Hot Deli: Top round of beef	(bread) 2.15 (roll) 2.35
Wednesday, August 21	
Beef noodle soup	(cup) .65 (bowl) .85
Pot roast of beef & oven roasted potato	2.40
Fresh ham w/ sweet potato & applesauce	2.30
Hot Del: Chicken patty Parmesan	(bread) 2.15 (roll) 2.35
Thursday, August 22	
Split pea soup	(cup) .65 (bowl) .85
Corned beef & cabbage	2.25
Spaghetti & meatballs	2.40
Hot Deli: French toasted ham & cheese	2.15
Special:	
Top your own Fruit Shortcake	.75
Friday, August 23	
Seafood chowder	(cup) .65 (bowl) .85
Salisbury steak & 1 veg.	2.25
Fresh breaded fish fillet & fresh broccoli	2.20
Hot Deli: Hot Italian beef	(bread) 2.15 (roll) 2.35

CREF Values

August	66.91	September	66.75
October	66.70	November	65.69
December	67.04	January	72.01
February	72.38	March	72.35
April	71.97	May	75.52
June	76.40		
July \$76.69			

Answers to Last Week's Quiz

25. b
26. b
27. d
28. c
29. b
30. d
31. d. The word *atom* comes from the Greek word meaning *uncuttable* or *indivisible*.
32. c. The probability that a particular radioactive nucleus will decay within a given time is independent of its history, and, in particular, of the time that has elapsed since it was created. The analogous statement for people is *not* true; the life expectancy of a person depends very much on the person's age, as is taken into account by insurance companies when they issue life insurance policies.
33. d
34. a. NaCl is table salt, ICBM stands for intercontinental ballistic missile, MIRV stands for multiple independently targeted reentry vehicle, and U-235 is the isotope of uranium that has a total of 235 particles in its nucleus. SALT stands for strategic arms limitation talks.

—BERA News—

Mark Your Calendar

Old time vaudeville is coming to town on August 23 and 24 at 8 p.m. in Berkner Hall. It will be entertainment the whole family can enjoy. Refreshments and a cash bar will be available. Tickets are \$3 for general admission and \$2 for students and senior citizens, and may be purchased at the door.

Bowling

Still needed for the upcoming bowling season are a men's team for Port Jefferson on Tuesdays and a mixed league team for Shirley on Thursdays. Applications are available at the BERA Sales Office in Berkner Hall.

Picnic Tomorrow

Afro-American Culture Club picnic is tomorrow from noon to 6 p.m. at the recreation area next to ballfield no. 5. Tickets are \$4 for adults, \$2 children; they are available from Renee Flack, Ext. 3316; Robert Mosley, Ext. 2358; Fred Nesbitt, Ext. 4001; Bruce Penn, Ext. 7213; Cosmore Sylvester, Ext. 2253; or at the picnic.

Golf

The fifth tournament of the BGA golf season will be held on Monday, August 26, at the Timber Point Suffolk County Golf Course in Great River. Tee times will begin at 11:00 and may be obtained by contacting Les Lawrence, Ext. 4107, Bldg. 515. The entry fee for BGA members is \$1 and \$2 for non-members. The deadline for signing up for the tournament is Thursday, August 22.

Volleyball

Anyone interested in seeing the U.S. Womens Volleyball Team versus the Japanese Womens Volleyball Team on October 23 at the Nassau Coliseum, call Lois Marascia, Ext. 4904, or Pat Carr, Ext. 7192 by August 14. Ticket prices are \$8.50, \$10.50, \$12.50 and \$30.00; VIP centercourt seats include a Post-Game get-together with the players. Group rates are available.

A pre-season captains' meeting will be held on September 4 at noon in Room A, Berkner Hall, to discuss the upcoming season. Anyone wishing to put a team together should attend this meeting.

