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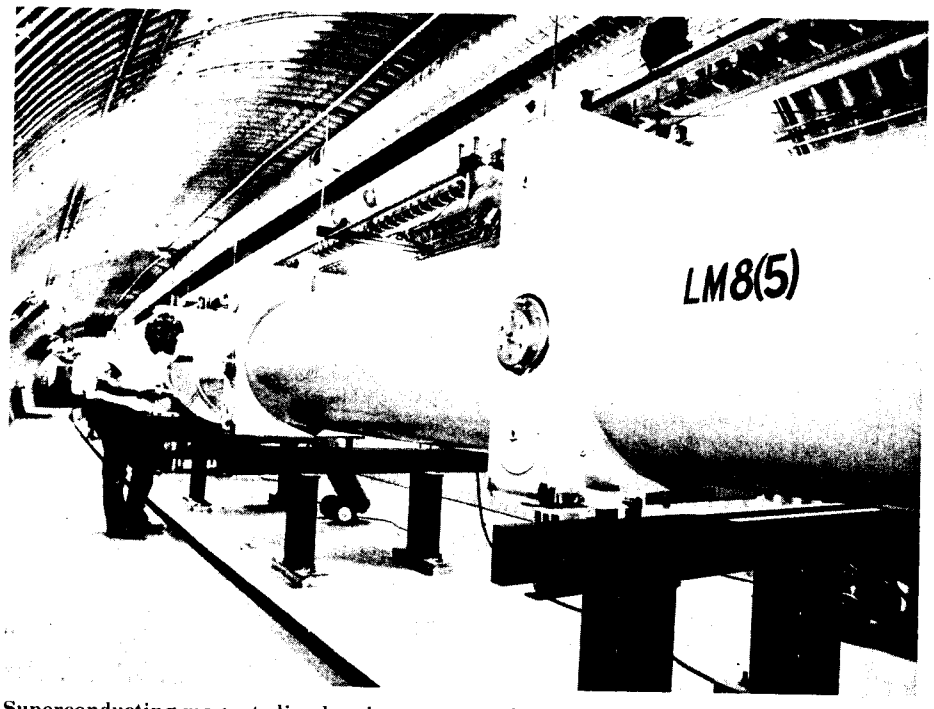
BROOKHAVEN NATIONAL LABORATORY



Superconducting magnets lined up in sextant 5 of the Colliding Beam Accelerator (CBA) tunnel are checked by Richard Ferdinand. Since mid-October, five dipoles, like LM-8 above, and one quadrupole have been installed in preparation for a full cell test next spring. Other important magnet milestones occurred throughout the year. The latest came in mid-December with the testing of the full-length dipole LM-14. This superconducting magnet set a new field record, reaching 62.2 kilogauss when cooled to a low temperature of 3.2 degrees Kelvin. Earlier in 1982, the Magnet Division attained an original goal with the March testing of the sixth full-length CBA dipole. By the end of the year, 24 superconducting cable magnets had been tested, including 13 full-length dipoles, ten shorter R&D dipoles and three quadrupoles. All of these magnets surpassed their design field and required no training to reach their short sample limit. These remarkable results led to a December decision to cease considering any alternative magnet designs and to focus all future efforts of the Magnet Division on production of these outstanding magnets. (For more on the CBA Project in 1982, see page 2.)

1982 In Review

The year 1982 started out with the appointment of Nicholas P. Samios as Acting Director. His subsequent appointment as Director was confirmed by the Trustees on May 1. Samios considered that his most pressing responsibility was to "keep alive the construction of a high energy collider to be finished in the late 80s...which was of great importance to the Lab," and to this end he devoted his energies.

The Colliding Beam Accelerator project, or CBA, made considerable progress in the further development of the cable magnets and other systems. (See opposite and page 2). The accelerator also underwent a name change. ISABELLE was superseded by the Colliding Beam Accelerator, a decision made because the original plans are probably gong to be modified, and a generic, rather than a specific, name was now called for.

Construction of the National Synchrotron Light Source began in 1978 and, this year, the facility opened its doors to experimenters. It was on time and within budget. (Further details on this page). The dedication of this, Brookhaven's latest star, was held on November 22.

Other significant achievements occurred at the High Flux Beam Reactor, the Power Transmission Project and the Tandem Van de Graaff, and are discussed on this page.

BNL spent $163,054,036 on operating expenses for the Fiscal Year 1982 (Oct. 1, 1981-Sept. 30, 1982); $12,785,821 was committed for capital equipment; and DOE made available $22,637,000 to BNL for construction funds.

Also during the fiscal year, Brookhaven let 28,000 contracts for a total of $72 million. Of this amount, $22.6 million went to orders from Long Island firms, and $3 million to minority businesses.

At the end of the year, Brookhaven employed 3,173 employees. This was down 147 people from the same period in 1981. The roster of guests and research collaborators grew to 1,159 persons from universities, other labs and industry who came to conduct research at Brookhaven's unique facilities.

The report of the Cost Cutting Committee was submitted at the beginning of the year. The report has been studied and some suggestions have been adopted, some rejected and action on others is still pending. But in 1982 one of its major suggestions was accepted — the reduction of vacation carryover from 36 to 31 days to take effect on September 25, 1983.

1982 was also the year that BNL celebrated its 35th anniversary — 35 years have gone by since the first Lab employee came to work at the Camp Upton site. And Associated Universities, Inc., which operates BNL, signed on as prime contractor to manage the Laboratory for the Department of Energy for another five years.

Through the Lab's tour program, over 12,000 people came to Brookhaven to find out about the Lab's research. This number included college and professional groups, visitors on Summer Sundays and high school students.

Light Source

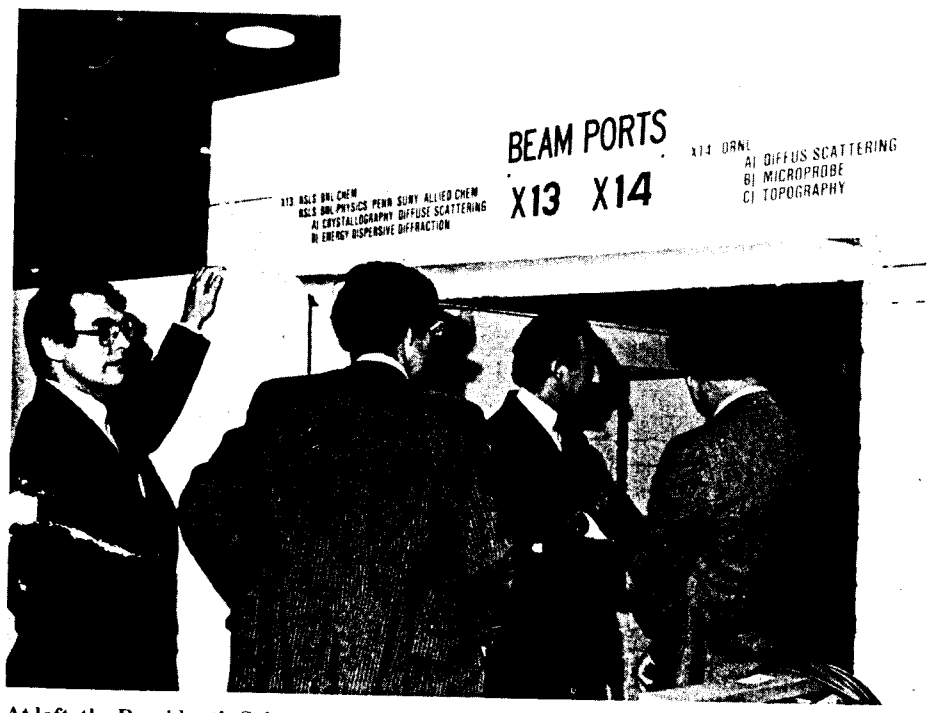
For the National Sychrotron Light Source, 1982 was a banner year marked by many exciting events. In February, John McTague was named head of the NSLS Division. But following the November dedication of the facility, he was head of the newly-created NSLS Department. And as the year ended, the department had more reason to celebrate, as x-rays coursed down a beam line for the first time.

Between those events, NSLS personnel achieved a series of important accomplishments. Early in May came the first light ever from the Light Source, when bluish light shone through the pyrex window of port U14 at the ultraviolet (UV) electron storage ring.

Full scale experimentation began at the UV ring in July. Early investigations included photoemission spectroscopy in the exciting region up to and above the carbon K-edge (ports U4, U7 and U14), gas phase spectroscopy of molecular clusters (U11), time-resolved fluorescence of noble gases and circular dichroism of biolgocial samples (U9), and soft x-ray microscopy of muscle tissues (U15).

An IBM lithography group at port U6 has already had some success testing the feasibility of using soft x-ray lithography to fabricate integrated circuits with submicron features. The group performed its first successful replication of an integrated circuit in November.

In 1982, the x-ray ring moved significantly closer to full-scale operations. In September, the achievement of a long-duration circulating beam was closely followed by multiple charging of the x-ray ring. Two months later, electrons in the x-ray ring were accelerated to 1.8 GeV with lifetimes of several minutes. And NSLS personnel got a wonderful present just before the December holiday shutdown when x-rays streamed down a beam line into the hutch at port X-13 at 1.7 GeV. This was the first time x-rays had left the ring and marked the beginning of the formal commissioning of the x-ray ring.



At left, the President's Science Advisor George A. Keyworth,II, a principal speaker at the dedication of the Light Source on November 22, toured the facility with others who attended the ceremony.

Power Boosts

A powerful year — that's what 1982 was at the Tandem Van de Graaff, the High Flux Beam Reactor (HFBR) and the Power Transmission Project.

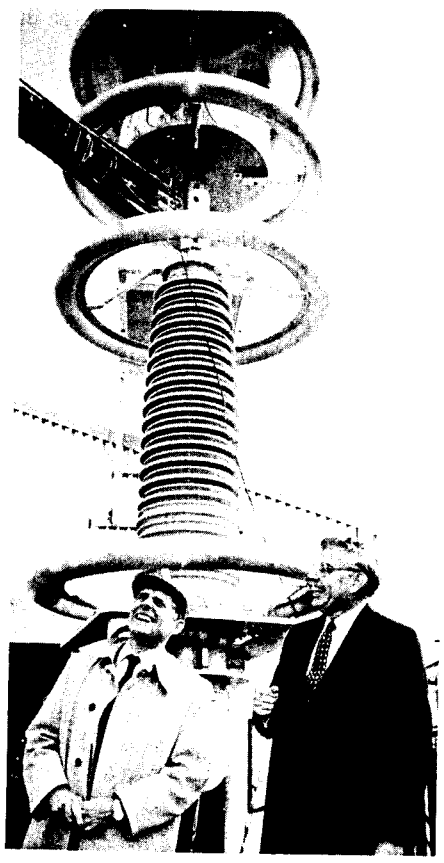
Power Transmission

The last day of October was the first day the Power Transmission Project reached full power. With 330 megavolt amperes (MVA) of power on each of the two cables at the test facility, the project was operating at the equivalent of 1000 MVA in a three-phase system.

The essence of the Power Transmission Project is superconductivity. At temperatures near absolute zero, certain materials become superconducting, losing all resistance to electricity, creating no energy-using electrical load and allowing power to flow through them unimpeded, with virtually no loss. As a joint operation of the Accelerator Department and the Department of Energy and Environment, the Power Transmission Project is intended to demonstrate to utilities that using superconductivity to transmit large amounts of electrical power over long distances and through congested areas would be both practical and cost-efficient. By achieving a power level almost double that attained by standard underground transmission systems, the Power Transmission Project has presented an effective case.

High Flux Beam Reactor

When the HFBR went to a power level of 60 megawatts (MW) on September 3, it culminated six years of effort by the entire Reactor Division.



Long Island Lighting Co. President, W. O. Uhl, (right) was guided by Eric Forsyth, head of Advanced Technology Applications, on an inspection of BNL's 1000 MVA superconducting Power Transmission system in December.

The 20 MW increase in power required changes to the physical makeup of the reactor, as well as intensive safety analyses to meet the Department of Energy's stringent standards for reactor safety.

The power increase was actually a two-stage effort. On August 30, the

(Continued on page 2)

Administrative Actions

On January 1, Alfred Mahlmann was named Manager of Plant Engineering and the division was partially restructured. The Electrical and Mechanical Divisions were combined to form the Engineering Division under M.J. Rose. J. Bruce Medaris was assigned to take charge of Maintenance Management, a newly created unit.

In February, Kenneth Ryan was appointed Technical Information Division Manager. He had been on the staff of the Kuwait Institute for Scientific Research.

In July, Michael Guacci was named to head the Supply & Materiel Division.

Following 35 years' experience in the Army, state and national government and in private industry, Earl Blanton took up his duties in October as the new Manager of the Affirmative Action Office.

William Marcuse returned to the Lab in October and was named head of the Office of Research and Technology Applications. He had been on leave at DOE's Office of Field Operations Management for the past two years.

An audit of Lab-wide administrative exempt jobs was completed and, as a result, Personnel developed new job descriptions and some individuals were reassigned.

The Lab reached agreement on economic items for the second year of the contracts with both the L.I. Guards Union and the International Brotherhood of Electrical Workers.

A new program for supervisors called Resources Management Training was introduced and, after this training, a total of 43 cost saving suggestions were produced by the participants, which saved the Lab approximately $400,000.

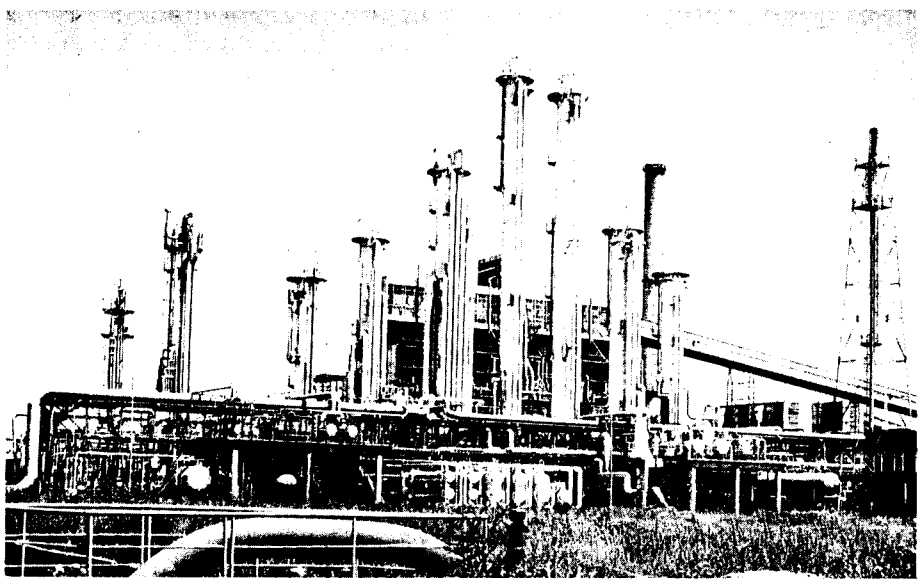
To increase investment options available to employees preparing for retirement, it was made possible to elect mutual funds in addition to the TIAA/CREF SRA.

A Computer Policy Committee was established this year to oversee computer-related matters at BNL. In addition to setting policies for allocation of, and payment for, the resources of the Lab's shared computational facilities at Applied Math, the Committee will address such issues as the standardization of hardware and software, new acquisitions, maintenance and the Lab's computing requirements for research and support activities.

BNL also boasts an array of computers devoted to the business aspects of the Laboratory. These computers are the province of the Management Information Systems (MIS) Division.

One of the main projects at MIS in 1982 was a new computerized system for ordering, receiving, paying for, accounting for and managing goods. It is called IPAP for its goal of integrating purchasing, accounts payable, receiving inventory management and order entry functions. The new system, to be completed in 1983, will be a powerful tool to aid the overall procurement process.

The MIS staff processes the major portion of BNL's sensitive computer applications, and they initiated the development of a computer security program. It was decided to concentrate on the development of a workable methodology that would promptly provide the necessary safeguards for that area, while serving as a prototype for use throughout the Lab. Subsequently, responsibility for the program was transferred to the Security & Plant Protection Section of S&EP.



The Kosovo coal gasification plant in Yugoslavia uses lignite coal to produce medium-BTU gas for heating and transportation, and hydrogen for ammonia synthesis. The towers are used to remove waste residual products from the purified gas.

Safety & Env. Protection

High on the agenda of the Safety and Environmental Protection Division in 1982 were programs centering on occupational and environmental safety, as well as protection of the Laboratory site.

A major environmental and occupational concern today is carcinogens, or cancer-causing agents. In response to this concern, S&EP's Center for Assessment of Chemical and Physical Hazards has been charged with developing an internal generic carcinogen guideline for the DOE community. In September, the Center held a workshop on "Problem Areas Associated with Developing Carcinogen Guidelines." The workshop provided additional technical input as well as a forum for considering specific problems including such areas of uncertainty as definition of regulated carcinogens, potency and risk assessment.

A coal gasification plant in Kosovo, Yugoslavia is the subject of a joint study by the United States and Yugoslavia. The study assists Yugoslavia in identifying the occupational and environmental health impact of the plant, which is representative of the kinds of facilities under consideration for future commercial use in the U.S. In October, S&EP hosted a delegation of six Yugoslavian scientists and engineers who came to BNL for a program review. Part of the study is an industrial hygiene assessment which consists of extensive personnel and work area monitoring programs to ensure that the existing standards, work practices and controls are adequate. The balance of the study is epidemiological and is designed to detect acute and chronic health effects.

Protecting the Laboratory site was the purpose of the extensive response training undergone by the BNL Police Group last February. The tactical exercises featured laser-equipped weapons in a program conducted by Sandia Laboratories for DOE.

The Laboratory's Emergency Response Plan provides guidance for Lab personnel during a site emergency. In November, the second annual exercise to test the Plan's effectiveness was conducted. This year's scenario supposed a major failure at the HFBR. Using current meteorological conditions, the S&EP staff evaluated its effects. This evaluation was used to order an immediate evacuation of the areas most directly affected, before a general evacuation of the Laboratory.

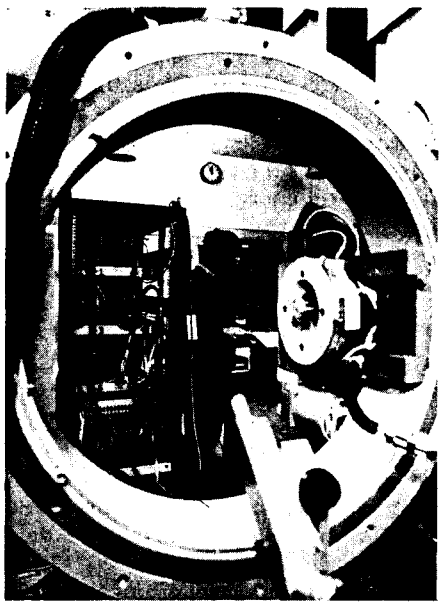
Instrumentation

Providing new tools and methods for high precision measurements in scientific research continued to be the number one priority of the Instrumentation Division in 1982.

One of the most important tools used at BNL are detectors. Gases, liquids and semiconductors are among the materials that may be used in this experimental equipment to detect charged particles, neutrons or photons. In 1982, emphasis was on position-sensitive detectors. Several x-ray detectors with a position resolution in the range of 100 micrometers have been completed for use at the NSLS. And the development of high precision, two dimensional neutron detectors has made the HFBR a world leader in the use of such equipment in neutron scattering studies of molecular and crystal structures.

Under development now are semiconductor detectors with a position resolution in the 10 micrometer range. Before such detectors become a practical tool, however, a number of problems must be solved. Toward this end, a detailed study of charge collection mechanisms in electrodes consisting of fine strips was completed in 1982.

Related efforts of the division involve the processing of signals from detectors and developing low noise electronic devices and circuits. Low noise and high counting rates were the main goal in the division's development of the "front-end" electronics for detectors. An area complementary to the development of the detectors concerns special data acquisition systems for high counting rates, large data arrays and time resolved x-ray and neutron scattering studies.



Frank Stubblefield works with a stepping motor-encoder control system developed for use in experiments at the NSLS and HFBR. It is shown here connected to a Chemistry Department goniometer, which positions the sample in crystallographic studies.

Throughout the year, the division continued to provide special services in the areas of vacuum deposition technology, electron microscopy, printed circuit board fabrication, scientific instrument repairs and maintenance of computerized on-line data acquisition and experiment control systems.

Applied Math

In the past, AMD's principal role has traditionally been to operate the site's large computers. With the proliferation of individual computers, the staff at AMD has become increasingly involved in planning and development for scientific computing throughout the Lab and is available for consultation on all computer matters.

In keeping with this changing role of computing support, AMD reorganized in July, creating two new groups. Arnold Peskin heads a Planning and Development Group while the Computing Coordination group is led by Kurt Fuchel.

Early in 1982, BNL computer users were given some relief from the absence of user friendly, interactive systems when the DEC Vax 11/780 was made available on a limited production basis. About the same time, BNL's connection to the nationwide government-operated computer network, ARPANET, was upgraded to full host status with electronic mail facilities.

A large mass storage system was installed in the Central Scientific Computing Facility (CSCF) in 1982. It consists of almost half a trillion bits stored on self-loading cartridges, a computer to perform storage management tasks, and a file transfer network to allow access to the other CSCF computers. The system has been used internally, has begun to be offered to users on an experimental basis, and is a cornerstone of more comprehensive local area computer network develoments.

The PUMA computer project has also undergone successful tests this year. PUMA is the product of a collaboration between BNL and New York University aimed at emulating the Control Data 6600 computer architecture with the advantages in cost, size and reliability afforded by more modern technology. PUMA has begun to be applied to aspects of the computer center's workload.

Honors

Awards were given to several of the Laboratory's scientific staff in 1982. Among those honored were:

Martin Blume, Associate Director for Low Energy Physics and Chemistry, received the 1981 E.O. Lawrence Award in Physics.

Raymond Davis, Senior Chemist, was elected to the National Academy of Sciences in April.

Maurice Goldhaber, AUI Distinguished Scientist, was selected as a co-recipient of the 1982 J. Robert Oppenheimer Memorial Award. In January, he assumed the presidency of the American Physical Society, and in September, he received a Doctor Honoris Causa degree at the University of Louvain-la-Neuve, Belgium.

Bernard Manowitz, Chairman of the Department of Energy and Environment, received an honorary Doctor of Science degree from Southampton College in May.

Nicholas Samios, Laboratory Director, was elected, in April, to the National Academy of Sciences.

Gertrude Scharff-Goldhaber of Physics was named 1982 Long Island Achiever in the Field of Science by the 110 Center for Business and Professional Women.

Benno Schoenborn, Senior Biophysicist in Biology, was awarded an honorary Doctor of Science degree at the May commencement exercises of the New Jersey Institute of Technology.

Norman Sutin, Senior Chemist, was named the 1983 recipient of the American Chemical Society Award for Distinguished Service in the Advancement of Inorganic Chemistry.

Warren Winsche, Deputy Director, was elected to the National Academy of Engineering in March.

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Energy and Environment

Research in the Department of Energy and Environment is organized into four areas: energy sciences, environmental sciences, energy technology and energy analysis. In 1982, several programs were successfully concluded and a number of on-going projects reached significant stages.

Now in print is the final report of a program that evaluated in the field, refit equipment for residential oil burners. Testing took place in Suffolk County, over a period of two years, and the end result was an unbiased assessment of the relative performance of several refit options and combinations of options being widely merchandised.

Rain Exclusion Shelters were designed and built at Brookhaven so that crops could be grown under normal field conditions, but with one exception — the plants are exposed only to a synthetic rain of a predetermined composition. When "normal" rainfall occurs, the crops are shielded from it by the portable greenhouses that automatically move into place to cover them. A pair of these shelters has just been constructed on the University of Illinois campus, under BNL supervision.

Coal-water slurry fuel atomization and combustion studies have been made which demonstrate the potential for using the fuel in place of imported oil. Coal-water slurries reduce the handling problems of conventional coal systems and show satisfactory combustion characteristics.

During the year, a new slurry reactor system was built to test highly-active catalysts that can convert carbon monoxide into a wide range of materials. The research is aimed at developing catalysts for the production of organic chemicals and transportation fuels, using a basic mix of carbon monoxide and hydrogen.

When rain clouds threaten, this Rain Exclusion Shelter is moved along tracks to cover experimental crops and protect them from natural rain. The experiment simulates an exclusively acid rain environment so that the effects on plant life can be scientifically observed.

Brookhaven-developed polymer concrete has found another application — as a material for rapid repair of airport runways. New formulations of polymer concrete were successfully tested during 1982 by the U.S. Air Force, which is seeking material that can cap bomb craters up to 75 feet in diameter and strong enough to support heavy aircraft approximately one hour from the time the patch is made.

The Bering Sea was again the destination of BNL oceanographers, who regularly go on cruises to study one of the world's most productive fisheries. The focus of this project is an area known as the "Golden Triangle," which lies between the Aleutian Islands and the Pribilof Islands. The coastal shelf there is extremely broad, allowing observation of processes taking place at different levels in the water over very long distances.

Through the year, scientists have been involved in a unique study of acid rain, using an airplane to get samples of cloud water. They are investigating the role cloud chemistry plays in the process by which acids are incorporated into rain.

1982 marked some administrative changes for the department. Alan Goland, who was Leader of the Solid State Group, Physics Department, was named Associate Chairman for Basic Energy Sciences, DEE. David Welch was appointed Assistant Head of the Material Sciences Division. Gilbert Raynor was named Associate Head of the Atmospheric Sciences Division.

Nuclear Energy

At the Department of Nuclear Energy, Herbert J. Kouts was reappointed for a second five-year term as Department Chairman. Anthony J. Romano became Department Administrator, and Robert A. Bari was appointed DNE's Associate Chairman and head of the newly-formed Division of Engineering and Risk Assessment, which combines the Engineering Analysis, Risk Assessment, Accident Analysis, and Reliability and Physical Analysis Groups.

DNE's activities in 1982 were varied. In May, the National Nuclear Data Center hosted a workshop, sponsored by the Electric Power Research Institute, on "Thermal Reactor Benchmark Calculations, Techniques, Results and Applications." This international meeting was followed, in June, by a 17-person delegation from Japan which came for the Third Japan-U.S. High Temperature Gas-Cooled Reactor Safety Technology Seminar.

The Corrosion Science group continued their independent reactor failure analyses, which are used by the Nuclear Regulatory Commission (NRC) in determining if a failed nuclear plant can safely return to operation. And a new program called the Plant Analyzer Project will help both the NRC and utilities in predicting nuclear reactor transients rapidly and cheaply. Transients are situations here operating conditions change, resulting in abnormal pressure and/or temperature in a circuit of the reactor.

The Plant Analyzer Project started in FY'82 and feasibility with regard to speed and accuracy was demonstrated in September. The analyzer that will be developed under this program will make it possible to predict the outcome of an operator action during abnormal operation, when the operator can assess a wide range of options and select the one most likely to return the reactor to a normal or safe status.

Robert Barletta (DNE) does soil sampling in a trench at a low level waste burial site at Hanford, Washington. From these samplings researchers see how soil affects the buried waste, and corrosion rates can be inferred.

The present program uses state-of-the art computer hardware and software to achieve computing speeds ten times faster than real time. These speeds, and the analyzer's interactive capabilities, make it appropriate for many applications. A user will be able to interrupt a simulation of a long running transient, such as a small break, and predict the outcome of several strategies. Present training simulators will be improved by utilizing more realistic models, and an operator or engineer will be able to run many transients in a short time to provide experience and insight for accident diagnosis and mitigation.

Medical

Continuing studies in the Medical Department in 1982 were aimed at developing new or improved methods of medical diagnosis and treatment of the health effects of energy-related pollutants.

A major goal of the clinical pulmonary program is to correlate measurements of changes that occur in miners exposed to coal dust with the degree of their exposure. Nuclear medicine techniques have enabled the development of a unique approach to assessing pulmonary status and, consequently, very early pulmonary dysfunction can be identified. The more sensitive techniques have shown pulmonary impairment in the peripheral lung units of all miners.

To determine the degree to which coal dust becomes systemically distributed and retained in exposed miners, spleen and liver sections were taken at autopsy from 98 retired bituminous coal miners and scored for black pigment. Approximately 40% of spleen and 30% of liver sections had more than trace amounts of pigment. The lungs and thoracic lymph nodes of all miners contained massive amounts of black pigment. When occupational information and pulmonary pathology evaluations were correlated with the histological findings, highly significant correlations were found between severity of pneumoconiosis and black pigment score for both spleen and liver, while significant correlations were found between years underground, years of retirement, and age at death vs. pigment score.

Another research goal of the Medical Department is diagnosis of disease at an early stage using noninvasive nuclear medicine procedures. Early diagnosis can lead to improved recovery rates and decreased hospitalization with a resulting improvement in health care quality at significantly less cost to the patient and society.

Development of new, clinically useful radiopharmaceuticals is the single most important factor in the growth of the field of nuclear medicine. The Brookhaven Linac Isotope Producer — BLIP — continues to be a source of research quantities of new or difficult to produce radionuclides.

Development of the difficult separation chemistry for producing tin 117m at the BLIP is now under way. This nuclide is a good candidate for the development of promising diagnostic and possibly therapeutic agents. Also under investigation is the application of beryllium-7-labeled carbon particles for the study of intestinal absorption of particulate matter, as well as the deposition, retention and redistribution of particles in the lungs. This nuclide is also being investigated for use as a noninvasive method of the *in vivo* determination of brain lithium content of individuals on lithium psychotherapy.

The Medical Physics Group has been involved in continuing efforts to find effective treatments for osteoporosis. A grant from Hoffman-LaRoche, Inc., awarded earlier this year, provides support over a three-year period to study the efficacy of treating post-menopausal osteoporosis with a new derivative of vitamin D, trade-named Rocaltrol.

Biology

In the Biology Department, an essential part of the research is devoted to determining the relations among the structures and functions of cellular components (such as toxins, proteins, DNA, chromosomes, ribosomes, membranes and chloroplasts), as well as the interaction of bacterial and mammalian viruses with cells.

Alkylating agents — common environmental pollutants — are mutagenic and carcinogenic. Among the many DNA products formed by such agents, one of the more deleterious is O^6-alkylguanine. At Brookhaven it was found that in human cells, the normal repair of this product takes place by the transfer of the alkyl group to an acceptor protein. Most human cell types contain about 100,000 acceptors. If fewer than 100,000 O^6-alkylguanines are formed in a cell, they all are repaired quickly. If more are formed, some are not repaired. Hence, the repair mechanism seems to have a threshold. A new assay system was developed to measure the abilities of cell extracts to repair DNA.

Several laboratories have recently shown that a mutation (from guanine to thymine) of a single base in its DNA can convert a normal cell to a cancerous one. The ability of cells to prevent such harmful mutations is being investigated at Brookhaven. Cells of *Streptococcus pneumoniae* were shown to prevent mutations by recognizing and correcting base pair mismatches in their DNA. Interestingly, some potentially mutagenic base changes, such as guanine to adenine were found to be frequently repaired. Others, such as guanine to thymine (the change that caused the cancer) were rarely repaired.

Isolation of human tumor genes is a major focus of current cancer research. Brookhaven biologists have developed a system using normal human cells as recipients for transforming genes from human tumor cells.

The department's station at port U9B of the NSLS UV ring began operating in early August. Initial experiments included measurements of the circular dichroism of DNA, RNA and proteins in short-wavelength ultraviolet.

Work with the Scanning Transmission Electron Microscope (STEM) has resulted in two important firsts: specific labeling of biological molecules, using heavy atom clusters; and a proposed new structure for dynein, the molecule responsible for motion of cilia and flagella.

The entire sequence of T7 DNA — 39,936 base pairs — was determined, after more than two years of intensive work. T7 DNA is a bacteriophage, a bacteria-eating virus.

A synthetic anticoagulant, D-phenylalanyl-prolyl-arginyl chloromethyl ketone, was patented in March.

Physics

Most of the effort in the Physics Department High Energy Program is concerned with work at the Alternating Gradient Synchrotron (AGS). Experiments are carefully selected in order to exploit the unique features of the AGS and its associated apparatus and to keep the program competitive with other labs that have higher energy accelerators. These topics include high statistics studies of hadron resonances, K mesons decays and neutrino interactions.

The first experiment on the Multiparticle Spectrometer II was a search for "glueballs," a new species of elementary particles beyond the normal quark-based resonances. The experiment studied double ϕ meson production and detected two new states with the expected characteristics of "glueballs."

The study of neutrino interactions continued, with the commissioning of a massive, 150 ton experiment to study neutrino-scattering. The experiment will yield precise information on the basic parameters of the weak interaction.

A BNL team collaborating in research at the CERN ISR, in Switzerland, reported the unambiguous observation of high energy jets, a subject of controversy in recent years.

Monte Carlo simulation of lattice gauge theories made substantial progress in including the effects of quarks. Lattice gauge theory calculations of hadron mass spectra gave many excellent results.

Precise calculations of the effect of neutron-anti-neutron oscillation on nuclear stability were performed with important implications for reactor experiments.

The first measurements ever carried out anywhere of γ-rays in coincidence with a (K,π) reaction were performed at the AGS with the Hypernuclear Spectrometer.

At the HFBR, the first measurements of nuclear magnetic moments were done at the Tristan mass separator. Recent work at the reactor has also revealed a new type of ordering sequence called "fractional staging." This is closely related to the concept of fractional charge, which has arisen in other branches of physics.

Liquid calorimeter modules interspersed with proportional drift tube planes provide a fine-grained live target especially suited to the study of elastic neutrino scattering from both electrons and protons.

Beams of slow positrons were used for the first time to observe the vibrations of excited gases adsorbed on metallic surfaces. This technique promises to give higher resolution than has been obtained with electron beams, and the results should be important for understanding catalysis.

At the NSLS, synchrotron radiation from the UV ring has been used to study the nature of amorphous carbon, as well as the properties of carbon on metallic surfaces and its relationship to chemical reactivity.

A collaboration with University of California at Irvine and the University of Michigan began looking for evidence of proton decay deep in a salt mine near Cleveland. Results are expected soon.

Colliding Beam Accelerator

In terms of both people and progress, 1982 was a memorable year for the Colliding Beam Accelerator (CBA) Project.

In October, Paul Reardon became BNL Associate Director for High Energy Facilities and assumed full responsibility for both the CBA Project and the AGS. When he came on board, the CBA Project was in the midst of research and development efforts aimed at determining the best set of parameters to apply to the final accelerator. Throughout 1982, the people involved in the project achieved an impressive record of progress on all accelerator systems as they worked toward this goal.

The dramatic accomplishments of the Magnet Division are described on page one. In addition, last November, the Cryogenic Division completed installation of the refrigeration system which will be used to cool the magnets in next spring's full cell test. This system includes the R&D refrigerator, three screw compressors, gas purification equipment and storage tanks and interconnecting plumbing. Also installed for the test were the magnet lead pot and helium transfer lines, as well as power supplies for energizing the full cell.

The power supplies were installed in the Major Facility at 6 o'clock which, in September, became the first experimental area to be formally occupied. Other facilities completed at the CBA complex in 1982 were the injection/ejection area (March), the Narrow Angle Hall (July) and the Major Facility at 8 o'clock (October).

In September and October, the four cold boxes of the CBA refrigeration system were delivered and installed in their final positions in the Service Building. By December, all major components of MAGCOOL were in place in Bldg. 902. MAGCOOL is the cryogenic facility that will be used for production testing of CBA magnets at the rate of one magnet per day.

Power (Cont'd)

HFBR went to 50 MW, then jumped to 60 MW in September.

The new power level provides a 50 percent increase in neutron flux. This greater neutron production gives researchers a better chance of success with experiments that might have been considered only marginal previously and reduces experimental time by one third, resulting in more beam time available for users.

Tandem Van de Graaff

Power at the Tandem is measured in megavolts (MV), or millions of volts. In mid-March, for the first time, the facility operated at 16 MV, delivering 133,333 times more voltage than required by ordinary household appliances.

Of course, the Tandem is no ordinary household appliance. With its ability to accelerate isotopically pure beams of many of the elements in the periodic table, it is a unique user facility for those who do nuclear and atomic physics. Since it began operating in 1970, at less than 10 MV, the Tandem has been constantly upgraded. The rise to 16 MV allowed experimenters to use a beam of zirconium-90 accelerated to 350 MeV. That's the highest energy heavy ion beam ever delivered by an electrostatic accelerator.

Accelerator

Primarily, the Accelerator Department supports the Alternating Gradient Synchrotron (AGS). In a continual effort to provide a facility that is responsive to the needs of modern high energy physics, the support given in 1982 was both far-reaching and various.

The protons that circulate through the AGS have their origins in a source at the beginning of the Linac, the linear accelerator that injects into the AGS. With the November changeover to an H- charge injection system, the intensity and serviceability of the AGS were greatly increased.

This change, and others at the AGS, requires that systems be modified to meet new demands. The AGS vacuum system is in the process of being upgraded. In last summer's upgrade of the AGS power supply system, the 7,200-volt Siemens motor was sent to New Jersey for reconditioning, while a lower voltage Westinghouse motor-generator was modified to serve as a backup.

In March, a fourth slow-extracted beam line was opened. The first experiment on the D-line studied spin dependence of nuclear forces in high energy proton interactions, using a polarized target. Meanwhile, also at the D-line, construction of the stopping muon channel has begun.

Here's what has been going on at the other experimental beam lines at the AGS:

- A — Modifications are under way to improve the high energy unseparated beam (A1 and A3).
- A/B — At the end of both beam lines A and B is the Multiparticle Spectrometer. An upgrade completed last April has resulted in the MPS II, which can yield ten times more data per hour of AGS time than could its predecessor. At the MPS II, work has begun on a sophisticated trigger system involving microprocessors and FASTBUS, the computerized data acquisition system developed in 1980 through a BNL/Yale collaboration.
- B — A critical two-inch gap electrostatic separator in the medium-energy separated beam was rebuilt, tested and installed. Beam line B5 was also rebuilt to accommodate the installation of an experiment on omega-minus production and decay modes. The B1 beam line is being rebuilt as a test beam facility.
- C — At the low-energy separated beam (LESB II), construction began on a five-inch gap in the spare separator, while the primary separators were rebuilt, tested and installed. LESB II was also upgraded with an additional quadrupole magnet. Beam C1 was extended by the installation of a 90-degree exclusive reactions experiment. The Hypernuclear Spectrometer in the LESB I was rebuilt to handle increased particle fluxes.
- U — Installation of the neutrino scattering experiment was completed. Design began on a neutrino oscillation experiment to be positioned near the center of the CBA ring.

Chemistry

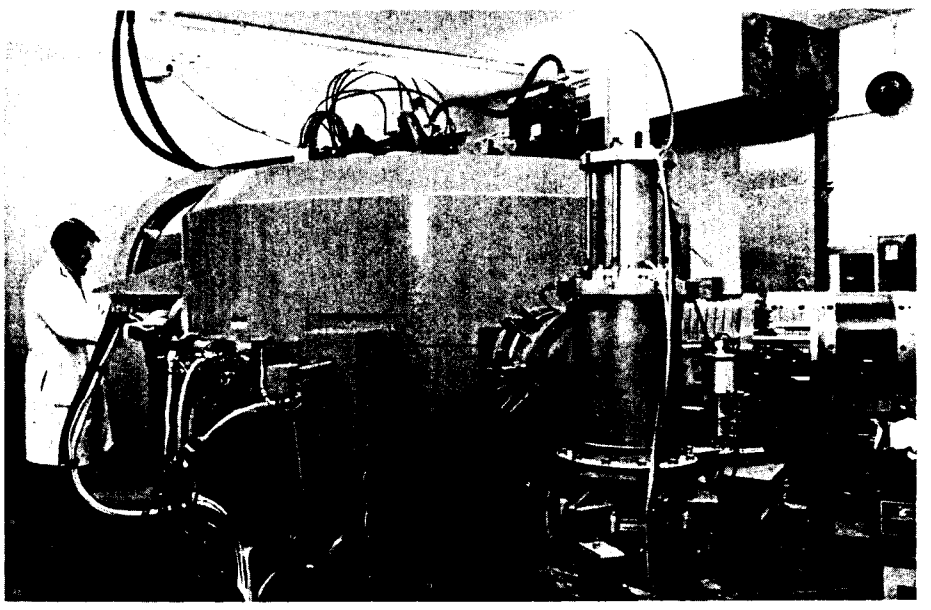
The Chemistry Department saw several new developments in 1982. Alfred P. Wolf was appointed Department Chairman in February. New facilities are in operation and some exeriments have yielded interesting results.

One of the newest facilities on-line is PETT VI. Like its predecessor, PETT III, this newest generation positron emission transaxial tomograph is a scanner that can quantitatively measure such brain functions as regional glucose metabolism. For a PETT scan, a short-lived radioactive tracer is administered to the subject and taken up by the brain. Detectors record the amount of radiation emitted by the tracer. This data is then fed into a computer which reconstructs three-dimensional pictures of brain function, showing how the tracers were metabolized and providing clues to neurological disorders.

Three beamlines in which the Chemistry Department participates are now operating at the ultraviolet ring of the National Synchrotron Light Source. Data is being obtained in new research areas from a windowless gas-phase beam line; a beam line for time-resolved fluorescence spectroscopy and related experiments; and a beam line where photoelectron spectroscopy is being applied to the study of solids and surfaces.

Some investigations have focused on the roles played by the radicals perhydroxl (HO_2) and superoxide (O_2^-) in causing biological damage. Influencing their roles would be their reactivity, their ability to combine chemically with other atoms, molecules or radicals. Researchers in the Chemistry Department have determined the reactivities of these radicals with various compounds of biolgical interest, and have found HO_2 to be much more reactive than O_2^-.

Other research has involved a search for efficient catalysts that promote air oxidation of olefins and has led to the discovery of metal nitro complexes as catalysts, one example of which is $Pd(CH_3CN)_2/ClNO_2$.



Barclay Jones, Chemistry, uses the newly-installed cyclotron to make radioactive tracers for PETT VI. The small cyclotron is operating for the Radiopharmaceutical/Nuclear Medicine program.

BROOKHAVEN BULLETIN

Vol. 37 - No. 1 January 7, 1983

BROOKHAVEN NATIONAL LABORATORY

Len Emma, chairman of the BNL Blood Drive Program, congratulates blood donor Betty Pergan (DEE) who won the drawing for dinner for two at the Country House. The pre-holiday blood drive on December 20 and 21 netted 354 pints of blood, up 48 pints from December 1981.

Cooking Exchange

"Healthy Eating" will be the theme of the next meeting of the BERA Cooking Exchange on Wednesday, January 12. Among the recipes to be demonstrated will be a tofu cheesecake and a mushroom stew.

The Cooking Exchange is open to all on-site employees and their families. Meetings are held on the second and fourth Wednesday of each month, from 12:30 to 2:30 p.m. at the Recreation Building. For the $1.00 admission fee, those present receive copies of the recipes prepared and a sample of each dish along with coffee and tea. Babysitting is provided at 50¢ per child. For more information, call Nancy Nagy, 924-8160, or Adrienne Usher, 289-7658.

Cafeteria Menu

Week Ending January 14, 1983

Monday, January 10		
Spinach egg drop soup	(cup)	.65
	(bowl)	.75
Chicken livers & 1 veg.		1.75
Beef stroganoff on egg noodles		1.95
Hot Deli: Roasted turkey breast	(bread)	1.85
	(roll)	1.95
Tuesday, January 11		
Lentil soup	(cup)	.65
	(bowl)	.75
Veal scallopini & 1 veg.		1.90
Swedish meatballs on egg noodles		1.85
Hot Deli: Sandwich steak w/ peppers & onions	(bread)	1.95
	(roll)	2.05
Wednesday, January 12		
French onion soup w/croutons	(cup)	.65
	(bowl)	.75
Salisbury steak & 1 veg.		1.85
Southern-fried chicken & 1/veg.		1.90
Hot Deli: Sausage & pepper hero		1.95
Thursday, January 13		
Turkey noodle soup	(cup)	.65
	(bowl)	.75
Sweet and sour pork on white rice		1.95
Pot roast of beef & 1 veg.		2.00
Hot Deli: Monte Cristo		1.90
Friday, January 14		
Manhattan clam chowder	(cup)	.65
	(bowl)	.75
Shrimp, fries, & cole slaw		2.10
Beef hash & 1 veg.		1.85
Hot Deli: Clam boat		1.95

Motorcycle Club

An important meeting of the Motorcyle Club will be held on Monday, January 10, at the Recreation Bldg. at 5:15 p.m. for election of officers and discussion of the trip to New York City on Saturday, February 5, for the Motorcycle Show. Please attend.

Folger Consort To Perform Jan. 19

The Folger Consort will present a program of Renaissance music at Berkner Hall on Wednesday, January 19, beginning at 8:30 p.m.

The Consort is in residence at the Folger Shakespeare Library in Washington, D.C., one of the world's leading centers of Renaissance studies.

On the program for January 19 will be a tapestry of medieval music. The Consort will perform pieces by Guillaume de Machaut, a noted 14th century musician and poet; selections of Italian trecento polyphony, which is distinguished by highly developed virtuoso vocal lines; a group of pieces from Southern France, marked by rhythmical complexity; and selected songs from the Cantigas de Santa Maria, a collection of more than 400 monophonic songs in praise of the Virgin Mary.

Musicians in the ensemble have broad orchestral, solo, chamber music and scholarly experience. Scott Reiss plays recorders, psaltery and percussion; Robert Eisenstein is accomplished on the vielle, rebec and recorder; Christopher Kendall plays the lute, mandora and harp; and soprano Ann Monoyios does all the vocal parts.

Tickets for the concert can be purchased the night of the performance. General admission is $7; students and senior citizens, $4; and those under 18, $3.

In Memoriam

It has been learned that **Calman Lasky,** Sr. Mechanical Engineer in the Accelerator Department, died on November 30 at the age of 65. He had been on long term disability the past few years after over 30 years at the Laboratory. He was a resident of Brightwaters, and is survived by his wife Dorothy, a daughter Marilyn and a son Lee.

Joseph E. Smith, Programmer/Analyst in the Department of Energy and Environment, died on December 17 at 60 years of age. He had been with the Laboratory since March 15, 1948. He was a resident of Patchogue, and is survived by his wife Laura, a daughter Sherrie, and a son David.

ASME Meeting

A joint dinner meeting of the Met/L.I. Section of the American Society of Mechanical Engineers will be held on Monday, January 31 at the Sheraton Center, 7th Avenue and 52nd Street, Manhattan. The featured speaker will be Nuclear Regulatory Commission Chairman Nunzio Palladino who will discuss "Future of Nuclear Power: A Regulator's Point of View."

The speech will be presented at 7:15 p.m., following a 5:30 cocktail hour and dinner at 6:30. Dinner, including one drink, costs $32. For reservations, with or without dinner, call Andre Feliciano, American Electric Power, (212) 440-9078.

Attention Aliens

Within ten days of any changes to their addresses, aliens are required to report those changes to the U.S. Immigration and Naturalization Service. Alien address report forms are no longer available at the U.S. Post Office, but may be obtained from the Office of Scientific Personnel, Bldg. 460.

1983 BNL Holidays

New Year's Day	Friday	December 31, 1982*
Washington's Birthday	Monday	February 21
Memorial Day	Monday	May 30
Independence Day	Monday	July 4
Floating Holiday	Tuesday	July 5
Labor Day	Monday	September 5
Veterans' Day	Friday	November 11
Thanksgiving Day	Thursday	November 24
Day after Thanksgiving	Friday	November 25
Christmas Eve	Friday	December 23 (½ day)
Christmas Day	Monday	December 26
Floating Holiday	Tuesday	December 27

*Even though New Year's Day was celebrated on December 31, 1982, it is still considered a 1983 holiday.

Aerobic Dance

Everyone is invited to sign up for new ten-week exercise sessions sponsored by the Aerobic Dance Club. Classes in both Aerobic Dancing and Stretchercize will begin later this month under the guidance of instructor Linda Sandberg. Aerobic Dancing will meet twice a week, on Tuesdays and Thursdays. The twenty lesson session costs $50. Stretcherize participants will meet once a week, on Wednesdays, for a total of ten lessons for $25. All classes will meet from 5:15 to 6:15 p.m.

Registration for Aerobic Dancing will be held on Tuesday, January 18, at 5:15 p.m. at the Brookhaven Center, and will be immediately followed by the first lesson. The first lesson will also follow registration for Stretchercize on Wednesday, January 19 at 5:15 p.m. at the Brookhaven Center. Full payment for each class is due at registration.

If you have any questions about either of these exercise programs, call Becky Bishop, Ext. 4386 or 286-0139 (home). Bishop was elected President of the Aerobic Dance Club in December. Other officers elected at that time were Jean Logan, Vice President, Ext. 4390, and Bonnie Wesolowski, Secretary-Treasurer, Ext. 4301.

Arrivals & Departures

Arrivals

Kenneth R. Davis ..... Plant Eng.
Graham J. Hook ..... Medical
Raymond Laneville ..... Central Shops
Melanie Meade ..... Medical
Frank U. Teich ..... Applied Math.
Kenneth J. Voska ..... Nuclear Energy
Deborah A. Spikes ..... Biology

Departures

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

David W. Dayton ..... Accelerator
Wolfgang U. Eberhardt ..... Physics
Albert C. Falango ..... Plant Eng.
Eugene Harchuck ..... Physics
Otto F. Kammerer ..... Energy & Env.
Martin C. Kaplan ..... Physics
Kyung S. Lee ..... Nuclear Energy
Steven H. Moss ..... Reactor
Viola H. McKenzie ..... S&EP
James Oster ..... Plant Eng.
Jack E. Phillips ..... Reactor
Susan M. Reilly ..... Nuclear Energy
Salvatore Saulle, Jr. ..... Applied Math
Mark W. Sutherland ..... Chemistry
Anita Swoboda ..... Energy & Env.
Andrew M. Zangwill ..... Physics

Theater Group

The Theater Group will hold a general meeting at 8 p.m. on Wednesday, January 12, in Berkner Hall. Anyone who is interested in BNL theater production is welcome.

WIS Lecture

Linda Lamel, Deputy Superintendent of Insurance, State of New York Insurance Department, will be the guest speaker at the next Women In Science Lecture on Tuesday, January 18. Her discussion of "Insurance: A Woman's Issue" will begin at approximately 6 p.m. in Berkner Hall.

As the first woman ever appointed to the position of Deputy Superintendent, Linda Lamel supervises the activities of her department's Property Bureau and Examinations Bureau. Her previous experience in state government was as Program Director with the Office of the Lieutenant Governor.

Ms. Lamel received her Juris Doctor degree from Brooklyn Law School and is a member of the New York and Federal District bars, the New York State Bar and Phi Beta Kappa. She is a trustee of the College of Insurance and a director of the Center for Women in Government.

A buffet dinner will be served at 5 p.m. with the lecture following immediately. The cost of the dinner is $8, including a glass of wine. To make a reservation, send a check, payable to BNL-WIS, Inc., to Ellen Gannon, Bldg. 801, Ext. 4513 before January 17.

CSCF Courses

The Central Scientific Computing Facility has scheduled the following data processing courses beginning in January:

- Introduction to Interactive Computing — January 10
- Introduction to the CSCF — January 11
- Introduction to BASIC — January 17
- Introduction to SYSTEM 2000 — January 18
- Pascal for Programmers — January 24

For more information, see the October 1982 issue of the BNL Computing Newsletter, or call Ronald Wittlock, at extension 4112.

French Festival

The gallette des rois (cake of kings), once a celebration of Epiphany, is now a seasonal tradition enjoyed by everyone in France. The gallette is shared among six friends. A bean or small charm is hidden in each gallette. Finding the bean transforms the lucky individual into king or queen for the evening; lucky or not, everyone samples sweet wines of the region.

The French Group of BNL will hold its annual Festival of Gallette des Rois on Friday, January 14, at 8 p.m., in the Recreation Bldg. For further information, call Daniele Bizais, extension 3186.

Volleyball

Standings as of 1/3/83:

Mixed League

A Division

Dinkers	8-1
EPO's	8-1
Teddybares	7-2
Mixed Ups	4-5
Nuts and Bolts	0-9
Nuclear Wastrels	0-9

B Division

Phoubars	17-4
TNT	17-4
Up Fagrabs	15-6
Semi Tough	15-6
Screwballs	7-8
Puff and Stuff	10-11
Chungas Revenge	5-10
Nuke Yorkers	7-17
KMA	7-17
Quirks	2-19

Open League standings will be posted in next week's Bulletin.

Classified Advertisements

Autos & Auto Supplies

68 VOLVO - 142, running, needs work, good parts car, $175. Tony, Ext. 2920 or 751-2760 eves.

76 MONTE CARLO - 305 cu. in. eng., orig. owner, $1,900. 878-1536 after 6 p.m.

79 CAMARO - Z-28, a/t, a/c, p/w, p/s, p/b, silver & red, mint cond., $1,700. 744-0290.

74 DODGE DART - sport, hi. mi., very reliable, 18-25 mpg, $900. Ext. 4682 or 689-8740.

72 OLDS 98 - fully powered, a/c, am/fm 8 track, good running cond., clean, $350. Frank, Ext. 4113.

TIRES - (2) ER78-14, good cond. Saha, Ext. 4339 or 924-6139 eves.

79 HONDA HAWK - 400cc, like new, asking $950. 588-0805 eves.

72 GRAND PRIX - good shape. 286-8718 after 6 p.m.

70 VW - semi-auto., 116K, $400. Ext. 4741, Dec. 17-20 only.

72 TOYOTA CELICA - manual, runs well, some rust, asking $500. Dave, Ext. 2694 or 941-9022.

72 PLYMOUTH - Satellite, p/b, p/s, a/c, 308 V8, auto., runs very well, $825. Ext. 3922 or 744-3235.

76 FIAT - 131S, 5 spd., 2 dr., a/c, am/fm, asking $1,400. Ext. 2521 or 928-8371 eves.

SNOWS - (2) G78-15 on Plymouth rims, balanced, $60. Joe, Ext. 4259.

74 VEGA WAGON - p/s, p/b, am/fm, radials, good cond., $650. 399-1713 days or 732-7353 eves.

80 SUZUKI - GS1000L, mint cond., luggage rack, many extras, must sell, $2,600. Ext. 7187 or 981-9474.

TIRES - 9:50-16.5, 8 ply, (2) good, 1 fair, $30. Bob Tallon, Ext. 4547 or 473-3987.

79 SUZUKI - DK100, new sprockets, chain, racing piston, number plates, $500. Pete, 289-0145.

SNOW TIRES - (2) mounted H78-15, $35. Bob, Ext. 2350 or 475-4382.

72 INTERNATIONAL VAN - Travelall, model 1010, p/s, a/t, p/b, priced to sell. 286-9389.

79 HONDA - CM400T, 2,000 mi., garaged, must sell, $1,000. Ext. 7125.

75 CAMARO - mags, 4 spd., 350, needs some body work, $1,600; 82 Kawasaki, KZ550 LTD, low mi., mint cond, $2,300. Ext. 4289 or 732-6489 after 5 p.m.

73 PLYMOUTH FURY - 4 dr., a/c, heater, radio, new tires. Ext. 3036 or 427-0768 eves.

73 EL CAMINO - estate, V8, std., am/fm, good cond., $3,000. Ext. 4689.

71 PINTO - 2000cc, new muffler, starter, battery, inspected, $400. 744-2783 after 7 p.m.

79 OLDS DIESEL - new engine, p/b, p/s, a/c, 2 doors, excel. cond., $5,800. Bob, 878-0922.

75 DODGE DART - 2 dr., sport, auto, a/c, p/b, p/s, am/fm, sunroof, good cond. Hirai, Ext. 4603.

SNOW TIRES - (2) 14", whitewall, F78-14 on Buick rims, good cond., $45. John, Ext. 4570 or 751-2655.

71 VW CAMPER - new paint, eng. shocks, tires, brakes, muffler, heater boxes, excel. cond., $2,000. 758-7807.

69 VW ENGINE - rebuilt, 4 excel. tires, $350, must take whole car. Bob, Ext. 7197 or 821-0705.

TIRES - (2) 14" AFX slotted chrome Plymouth mags; (1) F70-14 white lettered mounted tire, $35. 744-3141.

68 VW BEETLE - not running, good for parts, $65; 50 Plymouth station wagon, 6 cyl., stand., needs work, $295. Frank, Ext. 2022 or 399-4480.

70 GRAND PRIX - new brakes, fuel pump, stereo, runs good, make offer. 924-3281 eves.

72 VW SUPER BEETLE - new motor, paint, immaculate cond. in & out, $2,000. 758-7807.

72 VOLKSWAGON GHIA - new motor, paint, tires, excel. cond. in & out, $2,000. 758-7807.

71 CHRYSLER NEWPORT - good cond. in & out, auto., a/c, high mi., $475. 732-3105 after 5 p.m.

SNOW TIRES - G78-15, $30; 74 Chevy van, 1 ton, 350, 3 spd., runs good, some rust. Ext. 4098.

76 OLDS STARFIRE - V6, new tires, good cond. 732-6678 after 6:30 p.m.

TIRES - (6) Goodyear racing slicks, 6.00X13, some new, $150/all. Dave, Ext. 5211.

RIMS - (3) 14" Dodge rims, $7.50 ea.; (1) OH H78-14 tire, $15. Tony, Ext. 3658 or 3637.

77 PICKUP - 8 ft. bed, heavy duty, reg. gas, good cond., 6 cyl., 3 spd., asking $3,200. Slim, Ext. 3084.

JEEP TIRES - & rims, 4-15X8 aluminum rims, 4-15X10 white spokes, 4-1200 Flot-Tracs, all 5 lug. Vinny, 281-7230 after 5 p.m.

80 MONZA - V6, auto., a/c, p/s, p/b, new tires, excel. cond., must sell, $3,500. 281-7230 after 5 p.m.

FORD RIMS - (2), 16", $6 ea., (1) Chevy 16", $6. W. Bailey, 732-6266 after 5 p.m.

8' CAMPER - slide on for pickup, sleeps 4, sink, stove, ice box, $800. 567-8811.

DATSUN PARTS - 1200 eng., wheels, tires, etc.; Mazda wheel, $12. Dave, Ext. 5211.

SNOW TIRES - (2) Sears Superguard, X.S.T., H78-15, glass belted, on Chrysler rims, used approx. 500 mi., $60. Al, Ext. 4216 or 798-2002 eves.

71 VW BUG - yellow, stand., rebuilt eng., excel. running cond., $900 or best offer. Ext. 4743 or 924-8481.

46 H.D. FLATHEAD - 74 cu. in. original, complete, apart, needs restoration, $4,000, firm. 758-7807.

42 H.D. KNUCKLEHEAD - engine, 61 cu. in. complete, no papers, $500 firm. 758-7807.

75 SUZUKI - 185cc, $300. 821-9086.

75 PLYMOUTH DUSTER - factory 4 spd., overdrive, radials, vinyl top, excel. cond., asking $2,195. 588-7058 or 289-8479.

67 PONTIAC - Tempest, 350 V8, new brakes, am/fm cass., $400. 727-0499 eves.

TIRE - Sears E-70/14, good cond., $15. Ext. 3701.

76 FIAT - 131S, a/c, 5 spd., 2 dr., am/fm, asking $1,400. Ext. 2521 or 928-8379 eves.

SNOW TIRES - studded, mounted on VW rims, $25. Mike, 289-0494 after 6 p.m.

77 PLYMOUTH - Cordoba, p/s, p/b, a/c, am/fm stereo, power windows & seats, new radials, s/s wheels, 37,000 mi. 727-0948 eves.

SNOW TIRES - (2) L78-15, studded, mounted on Ford pickup rims, $45/pr. firm. Ext. 2304 or 286-2749 after 6 p.m.

54 HUDSON - Hollywood, restored. Ext. 3688 or 363-7032.

WHEELS - (2) w/tires, A-78-13, $15/pr.; am/fm radio w/rear speaker, $35; all from '74 Vega. John Agostine, Ext. 2050.

TIRE - (1) F-78-15, unused, 3 yrs. old., $25. Joe, Ext. 4259.

74 CAPRI - V6, new brakes & tires, $1,200. Mary Cay, 941-4011 after 7 p.m.

77 DATSUN - B210, 4 dr., a/t, 80,000 mi., needs carburetor, $1,800. 928-8340.

76 FORD - Granada, a/t, excel. cond., $1,350. Kiyo, Ext. 3785.

74 VW BUS - new paint, in good shape, offer over $1,300. Ext. 2023.

TIRE CHAINS - 7.10-15 or 8.00-14, $30. Bill, Ext. 3254.

75 PLYMOUTH - Duster. factory 4 spd. overdrive, radials, vinyl top, excel. cond., asking $2,195. 588-7058 or 289-8479.

68 BUICK SPECIAL - wagon, 350 V8, a/t, it runs, $250. Lloyd, Ext. 3381 or 286-1024.

70 CHEVY - Impala, 350, 8 cyl., 2 dr., hardtop, clean in & out, engine excel., $650; rims, (2) 15x10, 6 lug, good cond., $30. Joe, Ext. 7961 or 878-2655 eves.

CARBURETOR - Holley Economaster, fits 1976, 6 cyl. AMC engine, excel. cond., $40. Bob, Ext. 4551.

72 PLYMOUTH - Duster, runs well, body good, new tires, $850 or best offer. Ext. 3766 or 689-9392.

72 CHEVY NOVA - 2 dr., runs well, $900. Gerry, Ext. 3694 or 281-8296 after 6 p.m.

68 CHRYSLER - 383 eng., hi. mi., good station car or for parts, good engine, good trans., recent Insp. John, Ext. 5016.

77 BUICK - station wagon, 73K, excel. cond., $3,300. Luis, Ext. 2700 or 3180.

VW PARTS - Bosch tune-up kits, $22; bumpers, $27; front axle beams, $77, all brand new. Augie, Ext. 2419 or 325-0594 eves.

Boats & Marine Supplies

KAYAK PADDLE - & air bags, asking $180. Ext. 2521 or 928-8379 eves.

20' SAILBOAT - 1978 O'Day, KCB 3 sails, engine, many extras, like new. 289-0925.

16' HOBIE - 1980 Hell Cat, fully race equip., very cheap, $2,500 w/trailer. Ext. 2898 or 589-3407.

18' GARVEY - w/40 hp Johnson, good cond., sale, $600 for both. John, Ext. 3292 or 286-1348.

Miscellaneous

REFRIGERATOR - Westinghouse side-by-side, 25 cu. ft., copper, like new, $200; Realistic C.B., model TRC-422A, complete w/whip antenna, cable & mounting brackets, 1 yr. old, like new, $50. Ext. 3042.

GOLF CLUBS - & bag, 3,5,7,9 irons, left handed, great for young person, $20; men's bowling ball, $5. Doris, Ext. 3639.

MEN'S SKI BOOTS - Nordica, sz. 10, very good cond., $45 neg. Mary, Ext. 4132.

CASSETTE TAPES - BASF, C-90 & CrO_2. Ext. 2521 or 928-8379.

BABY BASSINET - w/extra mattress & skirt, $25. Doreen, Ext. 2456.

WINTER COAT - maternity, brown color, $20; Coleman metal cooler, $25; badminton racquet, $5. Wick, Ext. 4372 or 924-0582 after 6 p.m.

BABY CRIB - w/mattress, excel. cond., $40. Krishna, Ext. 4025.

HOME HUMIDIFIER - Sunbeam, $75; fireplace screen/andirons, 38"wx31"h, $15. Ed, 289-1430 after 6 p.m.

FIREWOOD - full cords, 4'x4'x8', $125 delivered. 467-8976.

CAMERA - 35mm, Olympus, 35RD range finder, auto. or manual operation, $65. Steve, Ext. 4211.

KEROSENE HEATERS - Radiant King, 8,500-20,000 BTU, discount prices, factory-sealed cartons, guaranteed. Jim, 924-7665 eves.

ATARI - Stampede, $15, never used. Ext. 2952.

FIRE EXTINGUISHER - 10 BC, 2-3/4 lb., new, $5. Ext. 2500.

GRINDSTONE - heavy duty, motorized; space air heater, new. Ext. 3688 or 363-7032.

BUNNIES - born Oct. 6, easy to care for, 5 avail. immediately, $8/ea. incl. supply of rabbit food. Ext. 3533.

CHANDELIER - contemporary, chrome, $45; chrome floor-to-ceiling lamp w/3 heads, $15. Ext. 3701 or 751-8128 after 6 p.m.

ELECTRIC RANGE - Sears, w/2 ovens, good cond., $95. 475-5448 after 6:30 p.m.

SNARE DRUM - w/stand & cymbals, $25; (2) solid oak twin beds, head & foot boards, rails & slats, $80 for both. Ext. 2898 or 363-7620.

PUMP - Burk's, 1/2 hp, 2 stage, deep-well, 3 yrs. old, $125. Harris, 475-8504 after 5 p.m.

TABLES - (3) Lane, coffee, step, square, fruitwood, good cond., $150. Jerry, 475-5591 after 6 p.m.

LAWN TRACTOR - John Deere, 38" cut, 42" snow blower attachment, chains, weights, used one season, $1,800. 929-4716 after 4 p.m.

CLOTHES DRYER - $40. Ext. 5334 or 862-7998.

STEREO SPEAKERS - Sound Design, never used, 25x15x10, $30/pr. Ann, 286-2280.

GOWN - women's size 10, blue flowered, short sleeve, never worn, $10. Angela, 744-5871.

WINDOW - Anderson, (1) 2x4, (1) 2x3, (1) combo storm/screen, 2'5"x4'5", $8/ea.; counter tops, stainless sink; water heater, 30 gal., prop. gas, $15; free standing Majestic contemp. fireplace w/stack, $35. Ron, Ext. 7696 or 289-1003.

PING PONG TABLE - large, 5'9', portable, can be folded, is on wheels, like new, $50. 589-2681.

DRUM SET - 4 piece, good cond., $100. Tom, Ext. 3128 or 928-7344.

CAMERA - Konica TC SLR, w/50mm 1.8 and 135mm telephoto w/cases, $150. Paul, Ext. 2447.

CABLE TV DESCRAMBLER - new, $169. 654-1731.

KITCHEN TABLE - formica butcher block top, square chromleg bench & chairs, needs recovering, $40; Riteway coal & wood stove, including sheetmetal cover for hook-up to hot air heating system & more, $500. 543-8153 after 5 p.m.

SEWING MACHINE - Singer, $75; double bed, $75; dinette set, $100; toaster oven, $15; Kitchen Aid coffee grinder, $25, (2) table lamps, $25/ea.; couch; upholstered chair, Garrard auto. turntable; pole lamp. 744-6874.

KEROSENE HEATER - Radiant King, 11,300 BTU, removable tank, mint, $100. Cecil, 289-3152 eves.

PUPPIES - English Cocker, born 9/26/82, 1 male, 1 female, blue roan, black & white, champion, 4 show bloodlines. 286-1662 eves.

WARMING TRAY - like new, cost $15, now $12. 744-9677.

HOLLY TREE - beautiful, over 8', you dig, $50. Irene, 589-5126.

STONEWARE - 4 place settings, used only once; baby carousel crib mobile, $6. Wick, Ext. 4372 or 924-0582.

DINING ROOM SET - walnut table w/leaf, table pad & 4 chairs, $150; Wilbur upright piano, ivory keys, excel. mech. cond., $375. George, Ext. 4227 or 751-0894 eves.

MOUTON LAMB JACKET - brown, fits sizes 14-16, good cond., $75. 475-0144 after 6 p.m.

19" COLOR TV - Sharp, $300; humidifiers; child car seat; toilet trainer, tricycle, plants. Ida, Ext. 3180.

REFRIGERATOR - Westinghouse, frost free in excel. cond. Frank, Ext. 3120.

COUCH - olive green, Italian Prov.; marble coffee table & end table; marble & crystal lamp. 369-2784 or 727-7458.

BEDROOM SET - white Proyincial, twin bed, dresser w/mirror, night stand, excellent, asking $200; rocking chair, good cond. 286-1097.

KITCHEN TABLE - formica butcher block top, square chromleg bench & chairs, needs recovering, $40; Riteway coal & wood stove, including sheetmetal cover for hookup to hot air heating system & more, $500. 543-8153 after 5 p.m.

UTILITY TRAILER - $100; antique piano, $250; Suzuki motorcycle, 185cc, $250; gas lawnmower, $30. 821-9086.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

WADING RIVER - custom built 4 bdrm. colonial, 2 baths, d/r, den, f/p, 2 car garage, full basement, private beach. Ext. 7727 or 929-4631.

For Rent

BELLPORT VILLAGE - south, near bay & stores, mid-Feb.-June 1983, completely furnished beautiful home, rent negotiable to responsible tenant. Ext. 9 or 286-0379.

SOUND BEACH - spacious 1 bdrm. apt., full bath, sun porch, yard, walk to beach, $430/mo. incl. util. Rose, Ext. 7908 or 744-3160 after 6:30 p.m.

BELLPORT - studio, private entrance, patio, kitchen, $300, utilities included. 286-9051.

STONY BROOK - 3 bdr2m. ranch, l/r, d/r, eik, 2 baths, 2 car garage, close to SUNY, Three Village S.D., avail. Feb., $600/mo. + util. 751-4868.

SHIRLEY - 1 bdrm. furn. apt., all util. incl. walk to beach, use of washer & dryer incl., $400/mo. 399-0327.

BROOKHAVEN - 3 bdrm. house, furnished, 1/11/83 to 7/11m/83, $450/mo. Ext. 3861 or 286-1975.

MANORVILLE - Pine Hills, 1 bdrm. chalet, avail. Feb. 1st, extras include f/p, dishwasher, garage & prime location, 10 mins. to Lab, $420/mo. inc. heat, golf, tennis, pool. 654-3041.

Carpools

NEW YORK CITY - centrally located carpool for anyone living in or near the city line. Ext. 3042.

MILLER PLACE/ROCKY POINT VAN - vacancy avail able. Don, Ext. 7902.

HUNTINGTON/GREENLAWN AREA - driver wanted. Jim, Ext. 5057.

PATCHOGUE - on time pool, opening for paying rider. Alyce, Ext. 2902.

BABYLON - West Islip, driver need for 4 person on-time carpool. Ext. 2500.

MIDDLE ISLAND - would like to join a carpool as a paying raider. Wick, Ext. 4372 or 924-0582.

RIVERHEAD - Lincoln St., paying rider needs transportation, 8:30-5:00. Vanette, Ext. 7991 or 369-2783.

Lost and Found

LOST - Tiny round knit purse (empty). Multicolored. Sentimental value. Dorie, Ext. 4385.

FOUND - machinist scale, 6 inch, near Bldg. 902. Ed, Ext. 7943.

FOUND - Did you lose something outside of the gym during the blood drive? If so, call & identify it to claim it. Elaine, Ext. 3331.

Wanted

HOUSE SITTER - responsible, mid-Feb.-June 1983, beautiful Bellport Village home near bay and stores. Ext. 2959 or 286-0379.

HOUSEMATE - mature woman to share house with female, Patchogue area, $200/mo. 289-1619.

YOUNG MAPLE TREES - to be taken down for wood, free, need power saw. 878-2516.

TO RENT - 1 or 2 bdrm. house or apt., Riverhead area, need for Feb. 1st, reasonable. Sheree, Ext. 2907 or 727-3167 eves.

SLOT CAR TRACK - old Aurotra type with pins and U-clips. Eric, 669-4845 or Ext. 2973 after 5 p.m.

TYPEWRITER TABLE - reasonable cond. & price. 286-8664.

HOME - for playful, lovable, attractive, family dog w/personality, owner leaving country. Ext. 2959 or 286-0379.

FIBERGLASS BOAT - 16'-18', 55-75 rhp motor, preferably Bowrider. John, 281-8021.

TRAINS - Lionel, American Flyer, access., any cond. brings good price. Carole, Ext. 3362 or 924-4097 eves.

ELECTRIC WHEEL CHAIR - for elderly handicapped person. Jim, Ext. 5057.

WORKING WOMEN - new members for business and professional women's club. National and International Affiliations. Alyce, Ext. 2902.

NUTRITION MINDED PEOPLE - to form Nutrition Study Group at Lab, plans include discussions, guest speakers, discounts on vitamins, etc. If interested call Fred Usack, Ext. 4798.

TO RENT - 2 bdrm. housie or apt., Bellport/Brookhaven area. John, Ext. 3292 or Audra, 286-1348.

TRAINS - Lionel, any "0" gauge or "027" gauge cars, track and equip. Frank, Ext. 3120.

FUEL OIL - converted to natural gas heating, will buy your unused fuel oil for cash. Don, Ext. 7902.

PERSONS - interested in skiing Gore, Feb. 25, 2 nights, $114/couple, free wine on bus. Claire, 689-7770.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the ***Bulletin****.*

HOUSE PAINTING - interiors, winter discount, professional, insured, many BNL references. Bob, 289-7657 after 6 p.m.

FIREWOOD - split, seasoned oak, 4'x16'x18", $110 delivered. 732-2849 after 6 p.m.

BLINDS - verticals, mini wovenwood shades, discount prices, complete installation. Tony, 928-9241.

INCOME TAXES - prepared by expert tax accountant, low fees. Bob, 286-5829.

LIMO SERVICE - luxury chauffered for wedding, night out, proms, airport. Roy, Ext. 4664 or 744-8779.

BABYSITTER - experienceds, loving care for your child in my home, Bellport/Brookhaven area. Gloria, 286-4005.

CLUB PATCHES - embroidered type, for all clubs, you design or we can. Ellen, 472-1500, 9 a.m.-5 p.m.

PAINTING - panelling, wallpaper, carpentry, free estimates, references provided upon request. John, 924-5012.

TILE SETTERS - ceramic, quarry tile, no job too small, free estimates. E. Harris, 475-6460.

ELECTRICIAN - licensed, reasonable rates, no job too small, aluminum wire outlets pigtailed, service changes. 744-0722.

INSULATION - "Fight Heating Costs", with cellulose insulation, S.M. Insulation Co. (we do not use foam). 281-5445.

WATERPROOFING - 15 yrs. in the business, we "guarantee" all of our work in writing, free estimates, Lab discounts. 281-5445.

EXTERMINATING - licensed men, all phases of pest control and termite specialists, no job too small, free estimates, Lab discount. 281-5445.

BABYSITTER - housekeeper, seeking employment on North Shore, experienced adult, own car. Ext. 3744 or 821-9781.

VW PARTS - & machine work, full line at wholesale prices, heads rebuilt, cases lineboard, other services available. Augie, Ext. 2419 or 325-0594 eves.

Classified Ad Policy Deadline is 4:30 p.m. Friday for publication Friday of the next week.