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**STAFF ROSTERS FOR 1979 -
ENVIRONMENTAL PROGRAMS**

MASTER

December 1979

DEPARTMENT OF ENERGY AND ENVIRONMENT

**BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK 11973**

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Master

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STAFF ROSTERS FOR 1979 - ENVIRONMENTAL PROGRAMS

B. MANOWITZ, Chairman

December 1979

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ABSTRACT

The roster of the scientific and professional staffs of the Environmental Programs of the Department of Energy and Environment has been compiled as of December 1979. Staff members have been listed according to their organizational units, i.e. the Atmospheric Sciences Division, the Environmental Chemistry Division, the Oceanographic Sciences Division, and the Land and Freshwater Environmental Sciences Group. Educational background, research interests, professional activities, summary of experience at BNL, and selected publications have been included for each member listed.

ENVIRONMENTAL PROGRAMS

BERNARD MANOWITZ	Senior Chemical Engineer; Chairman, Department of Energy & Environment
Education	Newark College of Engineering (B.S. in Chemical Engineering, 1943); Columbia University (M.S. in Chemical Engineering, 1947).
Research Interests	Environmental research, particularly of atmospheric pollutants resulting from fossil-fueled power plants, and oceanography and geochemistry of the coastal shelf; applied radiation, including the engineering of radioactive sources and the use of radiation to effect changes in chemical and biological systems; nuclear engineering, including radioactive waste handling, processing and disposal, fuel reprocessing, and reactor planning.
Professional Affiliations	American Institute of Chemical Engineers; Fellow, American Nuclear Society; American Geophysical Union.
Committees	Member, Research Coordination Panel, Gas Research Institute; Member, Scientific Advisory Panel, New York Bight MESA Project; past chairman, ERDA Publication Policy Review Board; past chairman, National Academy of Science Committee on Food Radiation Research; past chairman, National Academy of Science Committee on Radiation Sources; past director, Isotopes and Radiation Division, American Nuclear Society; past member, AEC Advisory Committee on Isotopes and Radiation Development; past chairman, Nuclear Engineering Division, American Institute of Chemical Engineers; past editor, International Journal of Applied Radiation and Isotopes; advisor to U.S. delegations to UN Geneva Conferences on Peaceful Uses of Atomic Energy, 1955-64.
Summary of Experience	Responsible for design and development of the original BNL radiochemical waste concentration and disposal system. As Associate Head, Chemistry and Chemical Engineering Division, directed research on waste processing, fuel reprocessing, and nuclear reactor engineering. As Head, Radiation Division, supervised programs in applications of radiation (from nuclear wastes, Co ⁶⁰ , and Cs ¹³⁷) to industrial processes, including design and construction of the High Intensity Radiation Development Laboratory (HIRDL). Received the Radiation Industry Award of the American Nuclear Society. Initiated studies of behavior in the atmosphere of sulfur oxides from power plant plumes. As Associate Chairman for Environmental Programs, first of DAS, then DEE, was responsible for development and direction of Department's research in atmospheric sciences, oceanography, and applied ecology.

BERNARD MANOWITZ cont.

Selected
Publications

B. Manowitz, L. Newman, and J. Forrest, The Applications of an Isotopic Ratio Technique to a Study of the Atmospheric Oxidation of Sulfur Dioxide in the Plume from an Oil-fired Power Plant, Atmospheric Environment 9, pp. 959-968 (1975).

B. Manowitz, Editor, Effects of Energy-related Activities on the Atlantic Continental Shelf, Proceedings of Conference, Brookhaven National Laboratory, November 10-12, 1975, BNL 50484.

B. Manowitz, Coordinator, DOE Oceanography Programs in the Mid-Atlantic Coastal Region, Second Annual Meeting of Brookhaven National Laboratory, March 7-8, 1978, BNL 25394.

WALTER D. TUCKER	Chemical Engineer
Education	Cooper Union Institute of Technology (B.ChE., 1941); Iowa State University (M.S. in Chemical Engineering, 1947).
Research Interests	Development of radioisotopes for medical and industrial applications; radiation engineering, including remote systems technology; power plant stack gas sampling.
Professional Affiliations	American Institute of Chemical Engineers; American Nuclear Society; Society of Nuclear Medicine; American Association for the Advancement of Science; Phi Lambda Upsilon.
Committees	Chairman-elect, BNL Lecture Committee; Member, National Program Committee, American Nuclear Society; Treasurer, Remote Systems Technology Division, American Nuclear Society; Member, Review Group, ANS-11 Standards Committee on Radioactive Materials Handling Facilities and Specialized Equipment.
Summary of Experience	Originally involved in design and development of processes, equipment, and facilities for the production of radioisotopes for medical and industrial use. Developed several generator systems for milking shortlived isotopes. Hold 3 patents for such systems. Responsible for original prototypes of current commercially available Tc-99 ^m and Ga-68 generators. Supervised radiation programs at AEC Atoms-at-Work exhibits in Peru, Thailand, and Yugoslavia. Engineer in charge of design, construction, and operation of Brookhaven Chemonuclear In-Pile Radiation Loop. Responsible for administration of environmental programs in the atmospheric, oceanographic, and terrestrial ecological sciences before assuming present duties as Assistant to the Chairman, Department of Energy and Environment.
Selected Publications	<p>F. E. Fowler and W. D. Tucker, <u>Potential Applications of Isotopes in Pollution Control</u>, <u>11th Japan Conference on Radioisotopes, Tokyo, Japan</u>, November 1975.</p> <p>W. D. Tucker, Editor, Atmospheric Sciences Annual Progress Report, 1974, BNL 50485, November 1975.</p> <p>W. D. Tucker, Editor, Annual Highlights-Environmental Programs, December 1978, BNL 50977, September 1979.</p>

ATMOSPHERIC SCIENCES DIVISION

P. A. MICHAEL

PAUL A. MICHAEL	Senior Scientist
Education	New York University (A.B. in Physics, 1949; Ph.D. in Physics, 1959)); University of Chicago (M.Sc. in Physics, 1955).
Research Interests	Atmospheric transport of air pollutants; mathematical modeling, micrometeorology.
Professional Affiliations	American Meteorological Society; American Physical Society; American Nuclear Society.
Committees	Member, Core Committee, MultiState Atmospheric Power Production Pollution Studies; Member, Computer Policy Advisory Committee, BNL; Past Member and Chairman, Reactor Safety and Critical Experiments Safety Committee.
Summary of Experience	Responsible for directing the research within the Atmospheric Sciences Division. The major research areas are the MultiState Power Production Pollution Study (MAP3S) which is investigating the long-range transport of air pollutants, and the Coastal Meteorology Program which is aimed at improving the prediction of diffusion in the coastal zone. Within the MAP3S program, serve as the inter-laboratory coordinator for numerical modeling. Past experience includes research in fluid dynamics, neutron physics, and reactor physics.
Selected Publications	<p>G. S. Raynor, P. A. Michael and S. SethuRaman, Recommendations for Meteorological Measurement Programs and Atmospheric Diffusion Prediction Methods for Use at Coastal Nuclear Reactor Sites, NUREG/CR-0936; BNL/NUREG-51045, October 1979.</p> <p>P. A. Michael, J. Tichler, R. Garber and R. Brown, MAP3S/SURE Intensive Study, July 19-20, 1978, Data Collected Onboard the BNL Aircraft, BNL 26577, August 1979.</p> <p>P. A. Michael, R. M. Brown and R. W. Garber, Comparison of Particulate and Gaseous Material Within and Above the Mixed Layer, <u>Preprint Volume, AMS Fourth Symposium on Turbulence, Diffusion, and Air Pollution, Reno, Nevada, January 15-18, 1979.</u></p>

CARMEN M. BENKOVITZ Chemical Engineering Associate I

Education Universidad de Villaneuva, Havana, Cuba (B.S. in Chemical Engineering, 1961); Columbia University (M.S. in Chemical Engineering, 1967).

Research Interests Management and analysis of environmental data with special emphasis in atmospheric emissions inventories, air quality and precipitation chemistry data.

Professional Affiliations American Institute of Chemical Engineers; Association for Computing Machinery; SIGMA XI, the Scientific Research Society.

Summary of Experience Responsible for the management and analysis of environmental data for various programs in the Department of Energy and Environment. Principal investigator for the Central Data Coordination Project of the MultiState Atmospheric Power Production Pollution Study (MAP3S) of the Atmospheric Sciences Division, a project involving the formulation and analysis of working data sets in the areas of air quality, precipitation chemistry, and atmospheric emissions inventories. Participated as BNL representative in the InterLaboratory Working Group for Data Exchange of the Department of Energy as well as other advisory workshops on the management of scientific data (most recently the Climate Program Data Management Workshop and the EPA Working Group on the Central Precipitation Chemistry Data Bank).

Selected Publications C. M. Benkovitz, Editor, DOE Interlaboratory Working Group for Data Exchange Progress Report - October 1978, BNL 51071, July 1979.

C. M. Benkovitz, The Use of SYSTEM 2000 in a Scientific Research Environment, ASTUTE Conference Proceedings for Spring 1979 Conference, Austin, Texas, April 3-5, 1979.

C. M. Benkovitz, Compiling a MultiState Emissions Inventory, Proceedings Conference on Emissions Factors and Inventories, West Coast Section APCA, Anaheim, CA, November 1978.

WILLIAM BORNSTEIN	Sr. Computer Sciences Analyst
Education	Michigan State College (B.S. in Mathematics, 1951); New York University (Graduate Student, Meteorology, 1951-53).
Research Interests	Meteorology, computer graphics, modeling and data reduction.
Summary of Experience	Research Assistant, Project on East Coast Cyclogenesis and Cloud Seeding; weather analysis and forecasting, 1950-55; computing and computer programming in nuclear reactor and reactor safety applications, including simulation and graphics, 1955-70, 1974-78. On-line and off-line low energy accelerator data reduction and processing, computer operations, 1970-74. Meteorological and air pollution data reduction and processing including graphics display of data, 1978 to present.
Selected Publications	H. S. Chang, D. J. Diamond, M. S. Lu and W. Bornstein, A Dynamic Analysis of BWR Scram Reactivity Characteristics, BNL-NUREG-50584.

ROBERT M. BROWN	Meteorology Associate I
Education	Spartan School of Aeronautics (Diploma in Meteorology, 1974); Hofstra University (B.A. in Physics, 1966).
Research Interests	Regional air pollution studies; coastal meteorology; meteorological instrumentation.
Professional Affiliations	American Geophysical Union; American Meteorological Society.
Summary of Experience	Participated in many governmental experimental programs dealing with atmospheric diffusion associated with emissions from power plant stacks; responsible for meteorological instrumentation used in atmospheric diffusion studies including airborne studies involving regional air pollution undertaken by the Department of Energy and the Environmental Protection Agency in the MultiState Atmospheric Power Production Study (MAP3S). Recent experience includes experimental studies at the land, sea, air interface off the coast of Long Island for the Department of Energy and in developing a recommendation for the Nuclear Regulatory Commission for supplementary meteorological instrumentation for incident response.
Selected Publications	<p>R. M. Brown, S. SethuRaman and C. Nagle, Atmospheric Stability Comparisons at Shore and Inland Sites, <u>Preprint Volume, Second Conference on Coastal Meteorology, Am. Meteor. Soc., Los Angeles, CA, Jan. 30-Feb. 1, 1980.</u></p> <p>P. Michael, J. Tichler, R. Garber and R. M. Brown, Data Collected Aboard the BNL Aircraft during AMBIENS, BNL 26161, April 1979.</p> <p>P. Michael, R. M. Brown and R. Garber, Comparison of Particulate and Gaseous Material Within and Above the Mixed Layer, <u>Preprint Volume, Fourth Symposium on Turbulence, Diffusion, and Air Pollution, Reno, NV, Jan. 15-18, 1979, pp. 368-71.</u></p>

THOMAS A. CARNEY	Meteorology Associate I
Education	Tennessee State University (B.S. in Physics, 1967); Saint Louis University (Master of Professional Meteorology, 1975); New School of Social Research, 1978-80.
Research Interests	Improvement of environmental impact assessment capabilities for use in regional energy planning; mathematical simulation of boundary layer properties.
Professional Affiliations	American Meteorological Society; American Association for the Advancement of Science.
Summary of Experience	Developed regional air pollutant transfer coefficients representative of winter SO ₂ and SO ₄ transport using a regional-scale trajectory model. Consultant to and responsible for development of technical reports covering the environmental impact of fossil and nuclear power plants and evaporative cooling towers. Supervised atmospheric impact assessment for a coal gasification and ammonia synthesis demonstration plant. Staff meteorologist for Tennessee Department of Public Health, Air Pollution Control Division, responsible for maintenance and development of regional air pollution control strategies for air pollution regulation changes; analyses of environmental impact of new or modified emissions sources; and air quality and meteorological monitoring site selection and evaluation. Staff Weather Officer, Detachment Chief Forecaster and Airborne Weather Reconnaissance Officer for the U.S. Air Force.
Selected Publications	<p>T. A. Carney, Evidence of the Role of Stratospheric Transport in the Distribution of Tropospheric Ozone, <u>Proceedings of the Air Pollution Control Association Specialty Conference on Oxidants/Ozone</u>, March 1976.</p> <p>J. A. Rasile, M. S. Fertel, P. C. Richie and T. A. Carney, Federal Environmental Policies and Their Effect on the Electric Utility Industry, <u>Preprints American Power Conference</u>, Chicago, IL, April 1978.</p>

VERONICA A. EVANS Computer Sciences Analyst II

Education State University of New York at Farmingdale (A.A.S. in Chemical Technology, 1964); Dowling College (B.S. in Mathematics, 1974).

Research Interests Manipulation and analysis of data for atmospheric modeling; use of data base management systems; statistical and graphical software packaging.

Professional Affiliations Association for Computing Machinery; Association of SYSTEM 2000 Users for Technical Exchange.

Summary of Experience Brookhaven National Laboratory 1964-69; 1973-present. Previously involved in the chemical analysis of environmental samples for radiological content. Presently involved in data manipulation and data analysis for atmospheric modeling; use of data base management systems, statistical, and graphical software packages.

JANET V. HAYES	Meteorology Associate III
Education	State University of New York at Albany (B.S. in Mathematics, 1958; M.S. in Biology, 1969).
Research Interests	Precipitation chemistry, coastal climatology, diffusion, micrometeorology.
Summary of Experience	Responsible for the analysis of data for precipitation chemistry studies and coastal climatology under the direction of G. S. Raynor. Participant in preparation of publications. Analysis methods include original FORTRAN programs and utilization of software packages such as 3PSS, 3IR, and BMDP. Previously (1961-73) participated in all phases of extensive pollen dispersion and sampling studies conducted by G.S. Raynor and E.C. Ogden of the New York State Museum and Science Service; studies funded by the PHS and EPA through the NYS Education Department. Prior to research activities, taught high school mathematics and college biology laboratory sessions as a Graduate Teaching Fellow.
Selected Publications	<p>G. S. Raynor and J. V. Hayes, Data Summary for Evaluation of the Transport and Diffusion Climatology of the United States East and Gulf Coasts, BNL 51098, July 1979.</p> <p>G. S. Raynor and J. V. Hayes, Analytical Summary of Experimental Data for Two Years of Hourly Sequential Precipitation Samples at Brookhaven National Laboratory, BNL 51058, May 1979.</p> <p>G. S. Raynor and J. V. Hayes, A Comparative Study of Diffusion Classification by Lapse Rate, Gustiness and a Modified Pasquill Method, <u>Proc. NATO/CCMS 9th Int. Tech. Meeting on Air Pollution Modeling and Its Application, Toronto, Canada, August 28-31, 1978.</u></p>

LAWRENCE I. KLEINMAN Associate Chemist

Education	City College of New York (B.S. in Chemistry, 1967); Yale University (Ph.D. in Chemistry, 1971); Postdoctoral Fellow, University of California at Irvine, 1971-73.
Research Interests	Kinetics and transport of atmospheric pollutants; turbulent flows; laser systems.
Professional Affiliations	American Physical Society.
Summary of Experience	Responsible for regional air quality analyses used in DOE evaluation of future energy scenarios. Research contributions in the fields of air pollution modeling, chemical kinetics, and quantum mechanics.
Selected Publications	<p>L. I. Kleinman, R. T. Cederwall and R. E. Meyers, Modeling Sulfur Oxide Concentrations: An Assessment of Energy Utilization Scenarios, <u>Proc. Sixth National Conference on Energy & Environment, Pittsburgh, PA, May 21-24, 1979.</u></p> <p>R. E. Meyers, T.-Y. Li, L. I. Kleinman and R. T. Cederwall, A Long Range Transport Model for Calculating the Atmospheric Impacts of Residual Sulfur Oxides, BNL 26185R, June 1979.</p> <p>R. E. Meyers, R. T. Cederwall, L. I. Kleinman and S. E. Schwartz, Atmospheric Production and Transport of Sulfur Oxides in the United States, BNL 26371, May 1979.</p>

MARTIN J. LEACH	Meteorology Associate II
Education	St. Joseph's College, PA (B.S. in Physics, 1971); St. Louis University (Meteorology, 1971-72); Drexel University (M.S. in Physics and Atmospheric Sciences, 1975); Ph.D. Candidate.
Research Interests	Diagnostic modeling of atmospheric diffusion and advection of air pollution; objective and variational analysis of meteorological fields.
Summary of Experience	Served as a weather forecaster in the U.S. Air Force. Assisted in the development of a large numerical code to forecast the development of mesoscale systems in the atmosphere, including cloud and precipitation processes. Also worked with verification of the model output.
Selected Publications	<p>M. J. Leach, Tests Using a Sequential Plume Cumulus Model for Forecasting Convective Precipitation, <u>Proceedings 6th Conference on Weather Forecasting and Analysis, American Meteor. Society, Albany, NY, May 10-13, 1976.</u></p> <p>C. W. Kreitzberg, M. J. Leach and R. G. Rasmussen, Convective Precipitation Prediction Tests Using Cumulus Model, Final Report, Techniques and Development Laboratory, No. 5-35361.</p> <p>C. W. Kreitzberg and M. J. Leach, Diagnosis and Prediction of Tropospheric Trajectories and Cleansing, <u>Proceedings 85th Annual Meeting of the AIChE, Philadelphia, PA, June 4-8, 1978.</u></p>

HSI-NAN LEE

Assistant Meteorologist

Education

College of Chinese Culture, Taiwan (B.S., 1970);
University of Utah (M.S. in Meteorology, 1973; Ph.D. in
Meteorology, 1977).

Research Interests

Atmospheric turbulent boundary layer flow and diffusion
theory; turbulent diffusion with nonlinear chemical
reactions in the atmospheric reactive flow; numerical
techniques associated with multi-step multi-grid method,
finite element method and finite difference schemes;
spectral analysis of the large-scale wave motion and
interaction in the atmosphere; air pollution studies
(theory, numerical schemes, and modeling).

Professional
Affiliations

American Meteorological Society; Sigma Xi.

Summary of
Experience

Responsible for (1) development of the new technique of
multi-step multi-grid; (2) development of three-dimen-
sional regional scale atmospheric transport and diffusion
model associated with chemical kinetics nonlinear reac-
tion; and (3) development of pseudospectral technique
applying in either explicit or implicit time schemes.

Selected
Publications

H.-N. Lee and S. K. Kao, Finite Element Numerical
Modeling of Atmospheric Turbulent Boundary Layer,
J. Applied Meteorology 18, 1287-95 (1979).

H.-N. Lee, Atmospheric Turbulence and Diffusion Boundary
Layer Transport Model, Fourth Symposium on Turbulence,
Diffusion and Air Pollution, Reno, NV, Jan. 15-18, 1978,
Preprint Volume, pp. 471-76.

BRUCE A. MARTIN	Computer Science Analyst I
Education	Polytechnic Inst. of Brooklyn (B.S. in Applied Math., 1964; Postgrad. studies in X-ray Diffraction; Physics Res. Assist., 1964-66); SUNY at Stony Brook (Postgraduate studies in Mathematics and Computer Science).
Research Interests	Application of computers to problem solution in the physical sciences; computer simulation and modeling; real-time process control and data communications; operating systems and compilers; programming language research education.
Professional Affiliations	Association for Computing Machinery (ACM); ACM Special Interest Groups on Programming Language (SIGPLAN); on Operating Systems (SIGOPS), and on Software Engineering (SIGSOFT). SIGPLAN Technical Committee on FORTRAN (FORTEC); American Crystallographic Association; American Institute of Physics; Faculty Member, Dept. of Accounting and Data Processing, Suffolk Community College.
Committees	Principal (Voting) Member, American National Standards Committee X3J3, FORTRAN; Chairman, X3J3 Standing Committee on Interpretation of the FORTRAN-77 ANSI Standard; Program Chairman and Member of Executive Committee, ACM SIGPLAN FORTEC; Steering Committee Member (Elected), BNL Computer Users Organization (CUO).
Summary of Experience	Responsible for the development of real-time process-control software, including the Tandem Van de Graaff data acquisition and analysis Sigma-7 system (LEAPFROG), and portions of the HFBR's SDS-920-based multiple spectrometer control system. Responsible for several application codes, including an oceanographic data base system for N.Y. Ocean Sciences Laboratories, and a two-fluid RELAP version for liquid metal fast breeder reactors. Established and managed a "Computer Information & Assistance" service at BNL. Responsible for aspects of operating system support, including monitor modifications, disk and tape drivers, maintenance of compilers and assemblers. Consultant to BNL departments on computer acquisition and installation, large-code architecture, model programming development, operating systems and compilers. Experience in major high-level languages, systems and assembly language on CDC CYBER, 3200, 924, DEC PDP-8 and -11, SDS 920 and SIGMA 7, IBM 650, 7040, 7094-11 and 3/0.
Selected Publications	<p>W. Brainerd et al., FORTRAN 77, <u>Commun. of the ACM</u> 22, 806-20 (1978).</p> <p>B. A. Martin et al., NALAP--An LMFBR System Transient Code, BNL 50457, 1976.</p> <p>A. K. Agrawal et al., SSC--An Advanced Thermohydraulic Transient Code for LMFBRs, BNL 50467, 1976.</p>

RONALD E. MEYERS

Meteorologist

Education

Rensselaer Polytechnic Institute (B.S. in Physics, 1963);
University of Utah (Graduate Student, Atmospheric
Sciences, 1967-70).

Research Interests

Atmospheric transport and transformation of pollutants;
meteorological modeling; mathematical modeling using
probability methods, real-time air quality analysis and
forecasts; using computer methods for quick technology
transfer of research to application areas; energy impacts
on environment and health; biometeorology.

Summary of
Experience

Direct research within the Atmospheric Physics, Modeling
and Assessment Section, Atmospheric Sciences Division.
Principal Investigator for: Development of advanced
numerical regional air-quality model for the MAP3S study
for EPA and DOE; development of air-quality models for
assessing the environmental impacts on inter-regional
scale for DOE; development of modeling methods for
determining the probability of optical battlefield target
acquisition through smoke (for Dept. of Army). Past
experience: Supervision of model development in
chem.-bio. defense in the Met. Res. branch, Dugway
Proving Gr., DOD. Staff member, Div. of Biomed. and
Envir. Research, AEC. Coordinated/developed methodology
in White House (Office of Science & Technology) project
which used met. modeling. Developed models/performed
analysis of air pollution impacts on U.S. for President's
Energy Plan for Committee on Nuclear and Alternative
Energy Systems (CONAES) and for OTA, Congress.

Selected
Publications

R. E. Meyers, C. Dopazo, E. O'Brien and R. Scott,
Application of Probability Density and Intermittency to
Random Processes in Envir. Chem. and Hydrodyn., Vol. I,
Advances in Env. Sci. & Eng., Gordon and Breach, 1979.

R. E. Meyers, R. Cederwall and W. Ohmstedt, Modeling
Regional Atmospheric Transport & Diffusion, Vol. II,
pp. 118-84, Advances in Env. Sci. & Eng., Gordon and
Breach, 1979.

RICKEY PETTY	Meteorology Associate III
Education	State University of New York at Albany (B.S. in Atmospheric Science, 1974).
Research Interests	Acoustic sounder applications to coastal and boundary layer studies.
Professional Affiliations	Member, American Meteorological Society.
Summary of Experience	In charge of collecting and analyzing pilot balloon data for various experimental endeavors carried out by the Atmospheric Sciences Division and other affiliated participants (e.g., Environmental Chemistry Division). Presently involved in reduction of meteorological data collected by newly acquired tethered sonde system for boundary layer studies. Aided in developing software to decode and analyze meteorological data transmitted from the National Weather Service on the modeling section's 11/70 minicomputer. Also responsible for collecting and archiving weather bulletins received since February 1979. On staff of weekly forecasters who are responsible for site and area alerts of major catastrophic weather phenomenon. Other tasks have included analysis of oceanographic buoy data and wind tunnel calibration of various wind instruments.

GILBERT S. RAYNOR	Meteorologist
Education	U.S. Navy Aerographer's School, 1942; U.S. Navy Radiosonde School, 1942; Hofstra University (B.S. in Applied Physics, 1962).
Research Interests	Atmospheric diffusion, micrometeorology, coastal meteorology, precipitation chemistry, deposition, ecology, ornithology.
Professional Affiliations	American Meteorological Society; American Ornithologists' Union; Wilson Ornithological Society; American Society of Mammalogists.
Summary of Experience	With Division of Atmospheric Sciences (formerly Meteorology Group) since 1952. In charge of experimental section of Division. Plan and conduct field experiments in coastal meteorology, micrometeorology, diffusion and precipitation chemistry. Recently conducted studies of transport and diffusion climatology of U.S. East coast for site planning and a study of meteorological programs for nuclear reactor sites. Coordinated multi-lab aircraft sampling program for EPA's NEROS program. Formerly planned and directed studies in particle deposition, pollen dispersion and spray droplet behavior in the atmosphere. Designed several new types of particle sampling instruments and sequential precipitation sampler. Author of numerous papers and reports.
Selected Publications	<p>G. S. Raynor, S. SethuRaman and R. M. Brown, Formation and Characteristics of Coastal Internal Boundary Layers During Onshore Flows, <u>Boundary Layer Meteorology</u> 16, 487-514 (1979).</p> <p>G. S. Raynor, P. Michael and S. SethuRaman, Recommendations for Meteorological Measurement Programs and Atmospheric Diffusion Prediction Methods for Use at Coastal Nuclear Reactor Sites, NUREG/CR-0936; BNL-NUREG-51045, 1979.</p> <p>G. S. Raynor and J. V. Hayes, Analytical Summary of Experimental Data from Two Years of Hourly Sequential Precipitation Samples at Brookhaven National Laboratory, BNL 51051, 1979.</p>

S. SETHURAMAN	Meteorologist
Education	Central Polytechnic, Madras, India (Diploma in Civil Engineering, 1958); Institution of Engineers, India (B.E. in Civil Engineering, 1966); University of Roorke, India (M.E. (Hons.) in Hydraulics, 1969); Colorado State University (Ph.D. in Fluid Mechanics, 1972).
Research Interests	Air-sea interaction, coastal meteorology, atmospheric turbulence and diffusion, air pollution, micro-meteorology, planetary boundary layer, tropical meteorology.
Professional Affiliations	American Meteorological Society; American Geophysical Union
Committees	Member, Committee on Ocean-Atmosphere Interaction of the American Meteorological Society, 1979-1982.
Summary of Experience	Conducted several air-sea interaction studies to understand the variation of wind stress over oceans and to parameterize the surface drag coefficient as a function of sea surface roughness. Studied modifications in the atmospheric boundary layer structure at land-sea interface and coauthored a report to the Nuclear Regulatory Commission recommending meteorological measurements for the siting of nuclear power plants at coastal sites. Participated in the International Monsoon Experiment (MONEX 79). Participated in the Indo-American Workshop on Marine Science of 1978 and on the Environmental Protection Agency Workshop on Meteorological Instrumentation, 1980.
Selected Publications	<p>S. SethuRaman, Momentum Flux and Wave Spectra Measurements from an Air-Sea Interaction Buoy, <u>Boundary-Layer Meteor.</u> <u>16</u>, 279-91 (1979).</p> <p>S. SethuRaman, Structure of Turbulence over Water During High Winds, <u>J. Appl. Meteor.</u> <u>18</u>, 324-28 (1979).</p> <p>S. SethuRaman, Atmospheric Turbulence and Storm Surge Due to Hurricane Belle (1976), <u>Monthly Wea. Rev.</u> <u>107</u>, 314-21 (1979).</p>

JOYCE L. TICHLER	Senior Computer Science Analyst
Education	Barnard College (B.A. in Mathematics, 1960); Columbia University (M.A. in Mathematics, 1961).
Research Interests	Hardware and software systems for acquisition and analysis of experimental data; statistical analysis of experimental data.
Professional Affiliations	Association for Computing Machinery; Special Interest Group for Graphics; AMC.
Committees	Member, Computer Users Organization Steering Committee at BNL.
Summary of Experience	Responsible for design and implementation of systems of computer programs used to calibrate, graphically display, form a data base of, do quality control on, statistically analyze and produce data reports for data collected in experimental programs of the Atmospheric Sciences Division. Maintain and disseminate on request a climatological data base of BNL. Provide consultation services on statistical and general computer problems arising in the work of the division. Presently involved in project for the Nuclear Regulatory Commission to design and implement a data base of effluents released by operating nuclear power plant. Also involved in study to advise NRC on acquisition of data collection system for meteorological parameters.
Selected Publications	<p>P. Michael, J. Tichler, R. Garber and R. Brown, Data Collected Aboard the BNL Aircraft During AMBIENS, BNL 26161, May 1979.</p> <p>P. Michael, J. Tichler, R. Garber and R. Brown, MAP3S/SURE Intensive Study, July 19-20, 1978, Data Collected Onboard the BNL Aircraft, BNL 26577, August 1979.</p> <p>P. Michael, R. Garber and R. Brown, MAP3S Characterization Flights - August 2-12, 1977, BNL 26584, August 1979.</p>

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ENVIRONMENTAL CHEMISTRY DIVISION

L. NEWMAN

LEONARD NEWMAN

Chemist

Education

Polytechnic Institute of Brooklyn (B.S. in Chemistry, 1952); Massachusetts Institute of Technology (Ph.D. in Chemistry, 1956); Royal Institute of Technology, Sweden (visiting scientist, 1962-63).

Research Interests

Studies of the atmospheric chemistry of sulfur and nitrogen compounds as they relate to the impacts of air pollution. Identification and measurement of the chemical composition of gases and aerosols.

Professional Affiliations

American Chemical Society and its Environmental Chemistry Division and the New York Section. American Association for the Advancement of Science, NY Academy of Sciences, Air Pollution Control Association, Sigma Xi.

Committees

Chairman, Measurement of Impurities in Liquid Metal Breeder Reactors (A-STM); Nuclear Methods Environmental Measurements (ANS); Technical Advisory Committee to the Public Service Commission (Wisconsin), Program Planning Multi State Power Production Pollution Study (DOE); Scientific Council (BNL).

Summary of Experience

Power plant plume and ambient measurements directed at determining the mechanisms and rate of oxidation of sulfur and nitrogen oxides. Development of analytical techniques for measuring the concentration and composition of atmospheric pollutants. Studies of complex ion equilibria of simple and mixed liquid complexes, hydrolysis reactions, solvent extraction principles, chemistry of actinide and less familiar elements, kinetic mechanisms, electrochemistry, and nuclear reactor fuel processing chemistry.

Selected Publications

J. Forrest, R. Garber and L. Newman, Formation of Sulfate, Ammonium, and Nitrate in an Oil-Fired Power Plant Plume, Atmos. Environ. 13, 1287 (1979).

J. Forrest, R. L. Tanner, D. Spandau and T. D'Ottavio, Determination of Atmospheric Nitric Acid with NaCl Impregnated Filters at High-Volume Flow Rates. Atmos. Environ. 14, 137 (1980).

R. L. Tanner, T. D'Ottavio, R. Garber and L. Newman, Determination of Ambient Aerosol Sulfur Using a Continuous Flame Photometric Detection System I. Sampling System for Aerosol Sulfate and Sulfuric Acid, Atmos. Environ. 14, 121 (1980).

RANA ABBAS	Research Associate
Education	Dunjab University (B.S. in Pharmacy, 1968); Columbia University (M.S. in Chemistry, 1971); University of Connecticut (Ph.D. in Chemistry, 1975).
Research Interests	Development of analytical methods for trace analysis of inorganic and organic species in the ambient atmosphere; wet chemistry; instrumentation; chromatography-densitization; organic reactions, structure elucidation of organics via spectroscopic methods and mass spectrometry.
Professional Affiliations	American Chemical Society; American Pharmaceutical Association.
Summary of Experience	Responsible for developing spectrophotofluorometric methods for microanalysis of drugs in the biological fluids and isolation and structure determination of drug metabolites - University of Illinois at Urbana, 1975-77. Experience in undergraduate teaching at the City University of New York, 1978. At BNL, fabricated a gas collection system for continuous sampling of atmospheric gases; developed, calibrated and tested under atmospheric conditions a real-time analysis system for ambient ammonia. Involved in developing HPLC analytical methods for oxygenated hydrocarbons and their organic pollutants in the environment and in particular organic species in the atmospheric aerosols.
Selected Publications	<p>R. Abbas and S. A. Galton, The Deuterium Isotope Effect and Migratory Aptitudes in the Clemmensen Reduction of 1-indanones, <u>J. Org. Chem.</u> <u>38</u>, 2008-11 (1973).</p> <p>R. Abbas, R. E. Willette and J. M. Edwards, Pipendine Derivatives Synthesis of Potential Analysis in 3-Substituted, 4-Phenylpiperidine Series, <u>J. Pharm. Sci.</u> <u>66</u>(11), 1583-85 (1977).</p>

ANTHONY J. CAMPILLO Associate Scientist

Education Cornell University (Ph.D. in Electrical Engineering, 1973); Princeton University (M.S. in Electrical Engineering, 1966); Newark College of Engineering (B.S. in Electrical Engineering, 1964).

Research Interests Laser spectroscopy of gases and aerosols; nonlinear optics; picosecond kinetic studies; photochemistry; photosynthesis; and tunable IR source development.

Professional Affiliations American Physical Society; Optical Society of America.

Summary of Experience Dr. Campillo, while at Brookhaven National Laboratory (6/79 to present), has been responsible for the development of laser instrumentation for atmospheric trace analyses and for conducting optical studies of gases and aerosols. Previously, at the Los Alamos Scientific Laboratory (10/72 to 6/79) he made significant advances in understanding the properties of extremely intense light beams as they propagate through solid media. He also conducted numerous picosecond kinetic studies on problems in the fields of photosynthesis, solid state physics and photochemistry. As a graduate student at Cornell University (9/68-10/72), he conducted spontaneous parametric scattering studies and developed IR parametric oscillators and mixers. Dr. Campillo has authored over 40 papers in refereed scientific journals.

Selected Publications A. J. Campillo, J. H. Clark, S. L. Shapiro, K. R. Winn and P. K. Woodbridge, Excited State Protonation Kinetics of Coumarin 102, Chem. Phys. Lett. 67, 218-21 (1979).

A. J. Campillo, R. C. Hyer and S. L. Shapiro, Broadly Tunable Picosecond IR Source, Optics Letters 4, 325-27, (1979).

A. J. Campillo, R. C. Hyer and S. L. Shapiro, Picosecond Infrared Continuum Generation by Three-Photon Parametric Amplification in LiNbO_3 , Optics Letters 4, 357-61 (1979).

RUSSELL N. DIETZ Chemical Engineer

Education Polytechnic Institute of Brooklyn (B.S. in Chemical Engineering, cum laude, 1960; Ph.D. in Chemical Engineering, 1964); National Science Foundation Fellow at Polytechnic Institute of Brooklyn, 1960-64.

Research Interests Correlation of stationary source combustion emissions; development of ultra-sensitive atmospheric tracer instrumentation; detection of clandestine explosives.

Professional Affiliations American Chemical Society.

Summary of Experience Early activities included computer correlation of unsaturated hydrocarbon yields from the pyrolysis of light hydrocarbons; the application of gamma irradiation processes for the fixation of nitrogen from air, the synthesis of ozone at cryogenic temperatures, and the dissociation of carbon dioxide; the kinetics of oxides of nitrogen formation in furnaces; iodine hydrolysis reactions pertaining to nuclear reactor loss of coolant accidents; and tertiary treatment of waste waters by irradiation and ozonation. Most recent activities include development of novel permeation devices; instrumentation for sub-part-per-quadrillion detection of atmospheric tracers; detection of clandestine explosives at airport environments; and effect of combustion parameters on pollutant emissions of fossil-fueled utility boilers.

Selected Publications R. N. Dietz and R. F. Wieser, Sulfur Trioxide Permeation Tube for Calibration of Sulfuric Acid Measurement Methods, Anal. Chem. 51(14), 2388-91 (1979).

R. N. Dietz and R. W. Garber, Power Plant Flue Gas and Plume Sampling Studies, BNL 25420, December 1978.

R. N. Dietz, R. W. Goodrich and E. A. Cote, Detection of Perfluorinated Taggants in Electric Blasting Caps by Electron Capture Monitors, New Concepts Symposium and Workshop on Detection and Identification of Explosives Proceedings, Reston, VA., Oct. 30-Nov. 1, 1978.

CLEVELAND J. DODGE Chemist Associate III

Education Marist College (B.A., 1970); Polytechnic Institute of New York (M.S., 1975).

Research Interests Laser spectroscopy of gases and aerosols.

Summary of
Experience Real-time analyses of air pollutants; wet and instrumental methods of analysis; environmental chamber studies of mutagenic substances; methods development for autoanalytical techniques; laser-Raman and interferometric analyses of gases and aerosols. Instrumental methods include atomic absorption, emission spectrometry, spectrophotometry-visible, gas and ion chromatography.

ROBERT F. DOERING	Associate Chemist
Education	Polytechnic Institute of Brooklyn (B.S. in Chemistry, 1951).
Research Interests	Development of methods for analyzing samples submitted to the Analytical Chemistry Research Group.
Summary of Experience	1952-62 was a member of Radioisotope Development Group. Assisted in the development of a number of systems for the operation of radioisotopes in which the medical field or industry had expressed an interest. In 1962, became a member of the Analytical Chemistry Research Group. Has since gained a broad working knowledge of instrumental analysis and a wide variety of classical wet chemical analysis.
Selected Publications	<p>A. J. Francis, S. Dobbs, R. F. Doering and P. Columbo, Microbial Production of Tritiated and Carbon-14 Methane from Radioactive Water, <u>Transaction of the American Nuclear Society</u> <u>33</u> 156-57 (1979).</p> <p>W. Antopol, L. Newman, R. F. Doering, C. Chryssanthos and E. Cronkite, Lead Exposure: Focal Concentrations from Atmospheric Fallout, <u>Mt. Sinai J. Med.</u> <u>41</u>, 250-53 (1974).</p> <p>A. J. Romano, D. W. Huszagh, J. Klein, R. F. Doering and L. Newman, The Use of a Self-Cleaning, Low-Cost Dilution System in the Conditioning of Flue Gases for Unattended SO₂ or NO_x Monitoring, <u>Combustion</u> 36-39 (1973).</p>

RUBY W. FAJER	Chemist Associat� III
Education	Brandeis University (B.A., 1958; M.A., 1960).
Research Interests	Derivitization of trace compounds in environmental samples for analysis by gas chromatography.
Summary of Experience	Organic syntheses of dyes for color film development at Polaroid Corporation. Preparation of bridged ferrocene compounds including general preparation, I.R. spectroscopy, and liquid chromatography. Derivitization of trace nitrate and sulfate anions with subsequent analysis by gas chromatography.
Selected Publications	R. L. Tanner, R. W. Fajer and J. Gaffney, Determination of Parto-per-Billion Concentrations of Aqueous Nitrate by Derivitization Gas Chromatography with Electron Capture Detection, <u>Analytical Chemistry</u> <u>51</u> , 865-70 (1979).

EUGENE M. FERRERI	Chemist Associate III
Education	Queens College (B.A., 1972).
Research Interests	Analytical chemistry, related to product development.
Summary of Experience	Employ ion chromatography as an analytical technique for sulfate and other anions; gas chromatography as a detection technique in the explosion taggant program.

JOSEPH FORREST	Associate Chemist
Education	City College of New York (B.S. in Chemistry, 1942).
Research Interests	Analysis and chemistry of atmospheric pollutants; kinetics of atmospheric reactions; stable isotope distribution; and mass spectrometry.
Professional Affiliations	American Chemical Society.
Summary of Experience	Developed a procedure for airborne filter collection of atmospheric sulfur dioxide and sulfates and measurement of their sulfur isotopic composition. Measured sulfur isotope fractionation in power plant flue gas. Developed a ^{110}Ag carrier technique for trace sulfur analysis. Utilized sulfur isotope fractionation and concentration measurements to determine kinetics and reaction rates of sulfur dioxide oxidation in power plant and smelter plumes. Perfected an impregnated filter procedure to measure atmospheric nitric acid and determined nitrate formation rates in a coal-fired power plant plume. Have performed stable isotope (S, C, N, H) measurements as applied to various research projects. Utilized emission spectroscopy for assorted analyses.
Selected Publications	<p>J. Forrest, R. L. Tanner, D. Spandau, T. D'Ottavio and L. Newman, Determination of Total Inorganic Nitrate Utilizing Collection of Nitric Acid on NaCl-Impregnated Filters, <u>Atmospheric Environment</u> 14, 137 (1980).</p> <p>J. Forrest, R. Garber and L. Newman, Formation of Sulfate, Ammonium and Nitrate in an Oil-Fired Power Plant Plume, <u>Atmospheric Environment</u> 13, 1287 (1979).</p> <p>J. Forrest, S. E. Schwartz and L. Newman, Conversion of Sulfur Dioxide to Sulfate During the DaVinci Flights, <u>Atmospheric Environment</u> 13, 157 (1979).</p>

JEFFREY S. GAFFNEY Associate Chemist

Education University of California, Riverside (B.S. in Chemistry, 1971; M.S. in Organic Chemistry, 1973; Ph.D. in Physical Organic Chemistry, 1975).

Research Interests Analytical technique development; gas chromatography/mass spectrometry; mass spectrometry; isotope ratio mass spectrometry; gas phase kinetics; atmospheric chemistry; organic geochemistry; air pollution monitoring; diagnostic chemical modeling.

Professional Affiliations American Chemical Society.

Summary of Experience Dr. Gaffney investigated reactions of ozone, peroxyacetyl nitrate (PAN) and in particular the kinetics, products and mechanisms of $O(^3P)$ atom reactions with organics during graduate studies. While a Research Associate in the Chemistry Department at BNL, his involvement with state of the art mass spectroscopy and stable carbon isotope ratio mass spectrometry techniques led to a number of applications in the biomedical areas. Since joining the staff of the Department of Energy and Environment, Dr. Gaffney has been responsible for establishing a GC/MS facility and developing research programs in the basic chemical sciences and environmental science areas.

Selected Publications J. S. Gaffney, A. P. Irsa, L. Friedman and E. A. Emken, $^{13}C/^{12}C$ Analysis of Vegetable Oils, Starches, Proteins and Soy-Meat Mixtures, J. Agr. Food Chem. 27, 475 (1979).

 J. S. Gaffney and S. Z. Levine, Predicting Gas Phase Organic Molecule Reaction Rate Using Linear Free Energy Correlations I. $O(^3P)$ and OH Addition and Abstraction Reactions, Int. J. Chem. Kinetics IX, 1197 (1979).

 J. S. Gaffney, E. T. Premuzic and B. Manowitz, On the Usefulness of Sulfur Isotope Ratios in Crude Oil Correlations, Geochemica et Cosmochemica Acta 44, 135 (1980).

ROBERT W. GARBER	Associate Chemist
Education	Philadelphia College of Pharmacy and Science (B.Sc. in Chemistry, 1965); St. Joseph's College in Philadelphia (M.Sc. in Chemistry, 1967); University of Pittsburgh (Ph.D. in Analytical Chemistry and Environmental Studies, 1975).
Research Interests	Analytical methods development for environmental studies: environmental measurements and conduct of field programs.
Professional Affiliations	American Society for Testing and Materials; American Chemical Society.
Committees	Intersociety Committee.
Summary of Experience	Responsible for the design and use of BNL Atmospheric Sciences Aircraft, including the conduct of major field studies, e.g., a power plant plume study under sponsorship of EPRI, ESEERCO, and LILCO, Regional Pollution Studies for MAP3S and Regional Ozone Studies for EPA. Responsible for development and modification of air pollutant measurement equipment for airborne and mobile use, e.g., recently modified flame photometric sulfur analyzer systems for BNL aircraft and size fractionating aerosol collection and measurement system. Has conducted similar work for Tennessee Valley Authority Air Quality Branch. (1971-75).
Selected Publications	<p>J. Forrest, R. W. Garber and L. Newman, Formation of Sulfate, Ammonium and Nitrate in an Oil-Fired Power Plant Plume, <u>Atmospheric Environment</u> <u>13</u>, 1287-97 (1979).</p> <p>R. L. Tanner, T. D'Ottavio, R. Garber and L. Newman, Determination of Ambient Aerosol Sulfur Using a Continuous Flame Photometric Detection System I. Sampling System for Aerosol Sulfate and Sulfuric Acid, <u>Atmospheric Environment</u> <u>14</u>(1), 121-27 (1980).</p> <p>R. N. Dietz and R. W. Garber, Power Plant Flue Gas and Plume Sampling Studies, Progress Report No. 3, Submitted in draft forms to EPRI, ESEERCO, and LILCO, October 1979.</p>

ROBERT W. GOODRICH	Chemist Associate I
Education	West Virginia Wesleyan College (B.S. in Chemistry, 1952), Oklahoma State University (M.S. in Chemistry, 1955; Phys. Chem., 1957-60).
Research Interests	Physical-inorganic chemistry; instrument development.
Summary of Experience	Instrumentation development in atmospheric tracer moni- tors, building coordinator and safety representative.
Selected Publications	<p>R. N. Dietz, E. A. Cote and R. W. Goodrich, Air Mass Movements Determined by Real Time Frontal Chromatography of Sulfur Hexafluoride. <u>Measurements Detection and Control of Environmental Pollutants</u>, International Atomic Energy Agency, Vienna, 1976.</p> <p>R. N. Dietz, R. W. Goodrich and E. A. Cote, Detection of Perfluorinated Taggants in Electric Blasting Caps by Electron Capture Monitors, <u>Proc. New Concepts Symposium and Workshop on Detection and Identification of Explosives</u>, Reston, Virginia, November 1978.</p> <p>G. I. Senum , R. W. Goodrich and R. N. Dietz, Detection of Vapor Tagged Simulated Bulk Explosives Utilizing the U.S. Customs Service Automated Baggage Examiner and the Brookhaven Continuous Electron Capture Monitor, BNL 26782, Oct. 1979.</p>

MARY T. KINSLEY	Chemical Associate I
Education	St. John's University (B.S., 1948); University of Kentucky (M.S., 1950).
Research Interests	Analytical chemistry; radiochemistry; environmental studies; waste management.
Professional Affiliations	American Chemical Society.
Summary of Experience	Developed methods for aerosol and acid rain studies. Methods utilized the following techniques: Atomic absorption, flame photometry, radionuclide tracer, and automated and manual spectrophotometry. Developed methods for the production of isotopes for medical use and the separation of fission products. Work involved neutron and proton activations, radiochemical separations, X-ray and gamma spectrometry, and alpha, beta, and gamma counting. Migration studies of radionuclide complexes in waters obtained from radioactive waste disposal sites. Procedures to separate, identify, and trace the movement of radionuclides along the flow paths of groundwater are applied.
Selected Publications	<p>M. T. Kinsley, E. Lebowitz and J. Baranosky, Production of Bismuth-204 for Medical Use, <u>Intern J. Nucl. Med. Biol.</u> <u>1</u>, 85-92 (1973).</p> <p>E. Lebowitz, M. T. Kinsley, P. Klotz, C. Bachsmith, A. Ansari, P. Richard and H. L. Athens, Development of Ruthenium-97 and Copper-67 for Medical Use, BNL 18622, 1974.</p> <p>M. T. Kinsley, T. Prody, P. Klotz and E. Lebowitz, Production of a Technetium-97m Low-Energy X-Ray Source, BNL 20184, 1976.</p>

PAUL J. KLOTZ	Chemist Associate I
Education	St. John's University (B.S., 1958).
Research Interests	Chemical mutagens; applications of ion chromatography.
Professional Affiliations	American Chemical Society.
Summary of Experience	Investigated the properties of milk proteins using electrophoresis and ultracentrifugation while employed in the Physical Chemistry Group of the National Dairy Research Corporation. As a member of the Analytical Chemistry Group at Brookhaven have analyzed numerous samples using wet chemical methods, specific ion electrodes, UV, visible and atomic absorption spectrophotometry, radiochemical methods, gas and ion chromatography. Due to considerable work with the actimide elements, gained much expertise in glare box techniques. While at Brookhaven, conducted research in the following areas: solvent extinction, chemical equilibria involving mixed metal complexes, production of radionuclides, atmospheric chemistry, and chemical mutation of plants.
Selected Publications	<p>C. H. Nauman, P. J. Klotz and L. A. Schauer, Uptake of Tritiated 1, 2 Dibromorthane by Tradescantia Floral Tissues: Relation to Induced Mutation Frequency in Stamen Hair Cells, <u>Environmental and Experimental Botany</u> 19, 201-15 (1979).</p> <p>C. H. Nauman, P. J. Klotz and A. H. Sparrow, Dosimetry of Tritiated 1, 2 Dibromorthane in Floral Tissue of Tradescantia, <u>Mutation Research</u> 38, 406 (1976).</p> <p>D. Leahy, R. Siegel, P. J. Klotz and L. Newman, The Separation and Characterization of Sulfate Aerosol, <u>Atmospheric Environment</u> 9, 219 (1975).</p>

DANIEL F. LEAHY	Chemist Associate II
Education	State University of New York at Farmingdale (A.A.S. in Chemistry, 1956). Adelphi University (B.S. in Chemistry, 1961).
Research Interests	Analytical chemistry; collection and determination of various air pollutants.
Committees	Member, Legislative Advisory Committee, State Senator James Lack (R,C East Northport, NY).
Summary of Experience	Perform analytical chemical measurements and develop methods including filter media for air pollutant collections and subsequent analyses. Adaptation, installation and operation of instruments and other equipment onboard an aircraft used for airborne air pollution studies.
Selected Publications	<p>D. F. Leahy, R. Siegel, P. Klotz and L. Newman, The Separation and Characterization of Sulfate Aerosol, <u>Atmos. Environ.</u> <u>9</u>, 219-29 (1975).</p> <p>R. L. Tanner, R. Cederwall, R. Garber, D. F. Leahy, W. Marlow, R. Meyers, M. Phillips and L. Newman, The Separation and Analysis of Aerosol Sulfate Species at Ambient Concentrations, <u>Atmos. Environ.</u> <u>11</u>, 955-66 (1977).</p> <p>R. M. Brown, D. F. Leahy, R. E. Meyers, P. Michael and L. Newman, Preliminary Airborne Investigations of Multi-urban Pollutant Concentrations on a Regional Scale, <u>First Conference on Regional and Mesoscale Modeling, Analysis and Prediction, Las Vegas, Nevada, May 6-9, 1975.</u></p>

JAI H. LEE

Assistant Chemist

Education

Seoul National University (Korea, B.Sc. in Chemistry, 1966); Catholic University of America (M.Sc. and Ph.D. in Physical Chemistry, 1971 and 1975, respectively); NAS-NRC Resident Research Associate at NASA/Goddard Space Flight Center, 1975-77; Research Associate (6 Mo.) at Catholic University of America.

Research Interests

Chemical kinetics in the gas phase including thermal, photochemical reactions. Atmospheric chemistry including tropospheric and stratospheric chemistry. Combustion chemistry particularly on the pollutant formation and reduction in the combustion processes. Interstellar and planetary chemistry. Atomic and radical reactions with substrates. Gas-particle interaction reactions and heterogeneous chemical kinetics.

Professional Affiliations

Membership, ACS, Physical Chemistry Division; AGU (American Geophysics Union); Guest Scientist at NASA/Goddard Space Flight Center.

Summary of Experience

Gas phase chemical kinetic studies of oxygen, hydrogen, deuterium, nitrogen, bromine and chlorine atoms with simple organic and inorganic molecules which are of interest in the atmospheric, interstellar and planetary environments using three different detection methods; Electron Spin Resonance, Mass-Spectrometer and Atomic Resonance Fluorescence which are coupled with the fast flow discharge systems and the flash photolysis technique. Laser-induced fluorescence detection of NH_2 radical using CW dye laser pumped with Argon ion laser in the fast flow discharge system.

Selected Publications

J. H. Lee and J. V. Michael, Rate Constant Measurements at Constant Temperature by the Flash Photolysis-Resonance Fluorescence Technique and Recombination - Dissociation Theory for NO_2 and NOCl , J. Phys. Chem. **83**, 10 (1979).

J. H. Lee, I. N. Tang and R. B. Klemm, Absolute Rate Constant for the Reaction of $\text{O}(^3\text{P})$ with CH_3SCH_3 from 472 to 273 K, J. Chem. Phys. **72**, 1793-96 (1980).

J. H. Lee and I. N. Tang, Absolute Rate Constant for the Reaction of $\text{O}(^3\text{P})$ with CH_3SSCH_3 from 270 to 329 K, 178th Annual ACS Meeting, Washington, D.C., Sept. 9-14, 1979.

YIN-NAN E. LEE	Research Associate
Education	Washington University (Ph.D. in Physical Organic Chemistry, 1976; M.A. in Chemistry, 1972); Tunghai University, Taiwan (B.S. in Chemistry, 1969); Military service 1969-70, ROTC, Taiwan.
Research Interests	Mechanistic investigation of chemical reactions in the fields of organic and atmospheric chemistry.
Professional Affiliations	American Chemical Society and its organic chemistry division.
Summary of Experience	Areas of research include: (1) effect of solution on nucleophilic displacement reactions; measurement and interpretation of heat capacity of activation, (2) reaction mechanism of acyl transfer reactions; identification of tetrahedral addition intermediate and its susceptibility to acid-base catalysis, and (3) rate of formation in the liquid phase of oxyacids of nitrogen from nitrogen oxides in the atmosphere; determination of the physical solubility and intrinsic chemical rate of nitrogen dioxide.
Selected Publications	<p>Y.-N. Lee and G. L. Schmir, Concurrent General Acid and General Base Catalysis in the Hydrolysis of an Imidate Ester. 1. Monofunctional Catalysis, <u>J. Amer. Chem. Soc.</u> <u>100</u>, 6700 (1978).</p> <p>Y.-N. Lee and G. L. Schmir, Concurrent General Acid and General Base Catalysis in the Hydrolysis of an Imidate Ester. 2. Bifunctional Catalysis, <u>J. Amer. Chem. Soc.</u> <u>101</u>, 3026 (1979).</p> <p>Y.-N. Lee and G. L. Schmir, Concurrent General Acid and General Base Catalysis in the Hydrolysis of an Imidate Ester. 3. Ethyl N-p-Nitrophenylformimidate, <u>J. Amer. Chem. Soc.</u> <u>101</u>, 6277 (1979).</p>

STUART Z. LEVINE	Associate Chemist
Education	City University of New York (A.B. degree in Chemistry, 1964); University of Pittsburgh (Ph.D. in Physical Chemistry, 1973); Teaching Fellow, University of Saskatchewan, Canada, 1973-1974; Visiting Research Associate, Ohio State University, 1974-77.
Research Interests	Physical chemistry; photochemistry and spectroscopy; gas-phase reaction kinetics; mechanisms of chemical processes in the atmosphere.
Professional Affiliations	American Chemical Society; Inter-American Photochemical Society.
Summary of Experience	Responsible for developing methods for constructing surrogate chemical mechanisms for use in modeling atmospheric photochemical systems. Theoretical work also includes methods for estimating reaction rate constants. Experimental research has included photoncounting, flash photolysis, and fourier-transform IR spectroscopy in studies of fluorescence emission and quenching, fast free-radical reactions, and kinetics of air pollution. These studies have led to the first observation of light emission from the second excited singlet state of thiophosgene and the identification of peroxyxynitric acid as an atmospheric pollutant. Dr. Levine has served as consultant and advisor to the atmospheric chemistry programs in both private and industrial laboratories.
Selected Publications	<p>S. Z. Levine, et al., A Kinetic Study of the Mechanism of Peroxyxynitric Acid Formation in Irradiated Mixtures of Chlorine, Hydrogen, Nitrogen Dioxide and Nitric Oxide in Air, <u>Nitrogenous Air Pollutants, Chemical and Biological Implications</u>, D. Grosjean, Ed., Ann Arbor Sci., Ann Arbor, MI, pp. 17-54, 1979.</p> <p>J. S. Gaffney and S. Z. Levine, Predicting Gas Phase Organic Molecule Reaction Rates Using Linear Free-Energy Correlations I. $O(^3P)$ and OH Addition and Abstraction Reactions, <u>International Journal of Chemical Kinetics</u> <u>11</u>, 1197-1209 (1979).</p> <p>S. Z. Levine and S. E. Schwartz, Construction of Surrogate CHEMical MEchanisms (SCEMEs) for Atmospheric Photochemical Systems. <u>Journal of Photochemistry</u> <u>9</u>, 104-06 (1978).</p>

HORN-BOND LIN

Research Associate

Education

National Taiwan Normal University (B.S. in Chemistry, 1970); National Tsing-Hua University (M.S. in Phys. Chemistry, 1972); The University of Pennsylvania (Ph.D. in Phys. Chemistry, 1980); Research Associate, Brookhaven National Laboratory 7-19-79 to present.

Research Interests

Laser photochemistry; picosecond kinetics; picosecond laser spectroscopy; laser spectroscopy of aerosols and pollutant gases; laser heterodyne interferometry.

Professional Affiliations

Inter-American Photochemical Society; American Chemical Society (Phys. Chemical Division).

Summary of Experience

Pollutant monitoring: Develop laser instrumentation for atmospheric trace analysis, techniques include laser heterodyne interferometry, stark shifting, laser Raman scattering, and radiometric detections. Graduate research: Establish the laser fluorescence spectroscopy of highly excited electronic states; develop a new technique for picosecond excited transient spectroscopy; picosecond kinetics, and chemical kinetics of gas reactions.

Selected Publications

H.-B. Lin and M. R. Topp, Excited Singlet State Kinetics on a Subnanosecond Time Scale, Chemical Physics 36, 365 (1979).

H.-B. Lin and M. R. Topp, Spectroscopic Measurements of Biphenylene Singlet States, Chemical Physics Lett. 64, 452 (1979).

H.-B. Lin and M. R. Topp, Evidence for Vibrational Mode-Selectivity in the Radiationless Relaxation of a Large Molecule, Chemical Physics Lett. 67, 273 (1979).

WILLIAM H. MARLOW	Physicist
Education	Massachusetts Inst. of Technol. (B.S. in Physics, 1966); University of Texas at Austin (Ph.D. in Physics, 1974); Postdoctoral Research Associate, University of North Carolina of Chapel Hill, 1973-74.
Research Interests	Aerosol microphysics - physical theory for aerosol forma- tion, growth, and transport processes; applications of aerosol microphysics to environmental, industrial, and energy concerns.
Professional Affiliations	American Physical Society; American Association for the Advancement of Science.
Summary of Experience	Conducted several computational studies of various aspects of aerosol unipolar and bipolar diffusion charg- ing including polarizable particles and polydisperse charging ions; applied charging calculations to the evaluation of aerosol measurement methods which depend upon diffusion charging. Devised a new procedure for obtaining size-related separation of sub-optical par- ticles for subsequent analysis or filter collection under ambient conditions. Gave conceptual design, including numerous innovations, and wrote program, including detailed calibration protocol, for probe to sample par- ticulate matter by extraction from post-combustor, pre- turbine gas stream occurring in combined-process energy generation from coal combustion. Organizer-editor of two volumes on aerosol microphysics; reviewed literature on the van der Waals interaction for application to aero- sols; gained broad familiarity with the physics of small particles and of their interactions. Extended currently- used, semi-empirical Fuchs method for calculating aerosol collision rates to include attractive, divergent contact potential and applied it to compute the collision rate enhancement due to Lifshitz-van der Waals interaction of free-molecular and transition regime water particles; gave new interpretations of relevant experimental data as a consequence.
Selected Publications	W. H. Marlow, Unipolar Aerosol Diffusion Charging II. Ion and Aerosol Polydispersities: The "Diffusion Charging Mobility Analysis" Hypothesis, <u>J. Colloid Interface Sci.</u> <u>64</u> , 549-54 (1978). W. H. Marlow, Editor, <u>Aerosol Microphysics I: Particle Interactions</u> , Springer-Verlag (Berlin, Heidelberg, New York) 1980. Chapter 1. Introduction: The Domains of Aerosol Physics, pp. 1-14 Chapter 5. Survey of Aerosol Interaction Forces, pp. 117-56.

HARRY R. MUNKELWITZ	Chemistry Associate I
Education	C.W. Post College (B.A., 1970).
Research Interests	Particle growth; gas to particle conversion; chemical kinetics; high temperature chemistry; nuclear reactor safety.
Professional Affiliations	American Association for the Advancement of Science; American Geophysics Union.
Summary of Experience	Employed initially as a technician on advanced reactor concepts by the Nuclear Engineering Department, Mr. Munkelwitz was responsible for designing and building many of the remote tools and fixtures used to remove the LMFR experimental loop from the BGR. Subsequently he worked as a technical specialist on the fast reactor safety program and was responsible for developing the methods and instrumentation used to make preliminary laboratory measurements of fission product diffusion, migration, and transport in high temperature reactor fuels. Most recently he has been concerned with the development and application of remote sensing techniques to the <u>in situ</u> study of aerosol growth and interaction with trace chemicals.
Selected Publications	<p>I. N. Tang, W. T. Wong and H. R. Munkelwitz, A Fast Converging Inversion Method for the Analysis of Diffusion Battery Data, <u>12th Aerosol Tech. Meeting, Warren, MI, September 1979.</u></p> <p>S. L. Nicolosi, I. Tang and H. R. Munkelwitz, High Temperature Mass Spectrometric Study of Cs_2O and Rb_2O, NUREG/CR-0867 BNL-NUREG 51030, June 1979.</p> <p>S. Aronson, M. Friedlander, I. N. Tang and H. R. Munkelwitz, The Interaction of CsI with High Chromium Alloys in the Presence of Oxygen, <u>J. Inorg. Nucl. Chrom. 41, 1209-11 (1979).</u></p>

MARY F. PHILLIPS	Chemist Associate III
Education	Alfred University, Alfred, New York (B.A. in Chemistry and Biology, 1953).
Research Interests	Air pollution studies--laboratory plus field work.
Summary of Experience	Air pollution studies: Application of analytical chemical techniques to problems of sulfur speciation in aerosols; development of a method for determining titratable acid in ambient aerosol samples; analysis of acid data using "SPSS" computer program; participation in field studies, ground sampling using a dichotomous sampler and airborne sampling aboard the BNL aircraft; development of a filter with applications for collection of particles in air (technical report in press); development of a g.c. technique for a qualitative and quantitative analysis of airborne carbonaceous particulate matter.
Selected Publications	R. L. Tanner, R. Cederwall, R. Garber, D. Leahy, W. Marlow, R. Meyers, M. F. Phillips and L. Newman, The Separation and Analysis of Aerosol Sulfate Species at Ambient Concentrations, <u>Atmos. Environ.</u> <u>11</u> , 955-66 (1977).

STEPHEN E. SCHWARTZ Chemist

Education	Harvard College (A.B. in Chemistry, 1963); University of California, Berkeley (Ph.D. in Chemistry, 1968); Post-doctoral Fellow, University of Cambridge, England, 1968-69.
Research Interests	<u>Atmospheric chemistry:</u> Studies involving transport and transformation of trace atmospheric constituents; laboratory investigation of model systems; field studies; instrumentation development; chemical and meteorological modeling. <u>Physical chemistry:</u> Studies involving reaction kinetics, spectroscopy, photochemistry, thermodynamics, and quantum chemistry.
Professional Affiliations	American Chemical Society; American Physical Society; The Chemical Society (London); American Association for the Advancement of Science; Inter-American Photochemical Society.
Summary of Experience	Studies of rainout and washout processes of nitrogen oxides and oxyacids (for Federal Aviation Administration); program includes review of chemical thermodynamics and kinetics of nitrogen oxide-oxyacid-water system; laboratory studies of kinetics and equilibria; field measurements and modeling. Interpretation and theory of atmospheric transformation, residence times, and scales of transport of trace atmospheric constituents, with special reference to sulfur compounds. Modeling gas-phase and homogeneous atmospheric kinetics. Laboratory studies of kinetics of gas-phase reactions and fluorescence. Assistant professor of chemistry, State University of New York (Stony Brook) 1969-75.
Selected Publications	S. E. Schwartz, Residence Times in Reservoirs Under Non-Steady-State Conditions: Application to Atmospheric SO ₂ and Aerosol Sulfate, <u>Tellus</u> <u>31</u> , 530-47 (1979). J. Forrest, S. E. Schwartz and L. Newman, Conversion of Sulfur Dioxide to Sulfate During the DaVinci Flights, <u>Atmospheric Environment</u> <u>13</u> , 157-67 (1979). S. E. Schwartz and W. H. White, Equilibrium Solubility of the Nitrogen Oxides and Oxyacids in Aqueous Solution, BNL 27102, January 1980.

GUNNAR I. SENUM	Associate Chemist
Education	Brooklyn College of the City University of New York (B.S., 1970); State University of New York at Stony Brook (Ph.D. in Chemistry, 1975).
Research Interests	Modeling of chromatographic systems as applied to the development of techniques for the detection of trace components; Hydrocarbon sampling in flue gas streams; Techniques for the tagging and detection of explosives; Flue gas desulfurization; and NO _x removal processes.
Professional Affiliations	American Chemical Society; American Physical Society; American Association for the Advancement of Science; Sigma Xi.
Summary of Experience	Was responsible for the experimental program, Steam Calcination of Limestone, which explored the possibility of lowering the energy requirements for limestone calcination by the introduction of steam into the limestone kiln. Assisted in the program for the development of an SO ₂ adsorbent for use in the fluidized bed combustion of coal. Was responsible for the experimental program, Evaluation of Vapor Taggants and Substrates for the Tagging of Blasting Caps, which developed a technique for the predetonation detection of explosives by trace detection of a specific vapor taggant emitted by explosives. Presently responsible for the development of a hydrocarbon sampling technique for flue gas sampling.
Selected Publications	<p>G. I. Senum, R. P. Gergley, E. A. Cote and R. N. Dietz, Detection of Tagged Explosives in a DC-9 Aircraft via Sampling of the Air Exhaust, BNL 26612, July 1979.</p> <p>G. I. Senum, R. W. Goodrich and R. N. Dietz, Detection of Vapor Tagged Simulated Bulk Explosives Utilizing the U.S. Customs Service Automated Baggage Examiner and the Brookhaven Continuous Electron Capture Monitor, BNL 26782, August 1979.</p> <p>G. I. Senum, R. P. Gergley, E. A. Cote and R. N. Dietz, Detection of Vapor Taggants used for Explosives Predetonation Detection in a Boeing 727 Aircraft, BNL 27099, October 1979.</p>

DANIEL J. SPANDAU	Chemist Associate IV
Education	Nassau Community College (A.S. in Medical Technology, 1975); State University of New York at Oneonta (B.S. in Chemistry, 1977); New York Institute of Technology (MBA, presently enrolled).
Research Interests	Atmospheric diagnostics; sub-microgram analytical methods development.
Professional Affiliations	American Chemical Society.
Summary of Experience	Participated in the development and/or modification of several sampling and analytical techniques for the determination of atmospheric gaseous and particulate compounds. Have been in several field sampling programs, which involved the setup and maintenance of real-time monitors and/or filter collection techniques.
Selected Publications	J. Forrest, R. Tanner, D. Spandau, T. D'Ottavio and L. Newman, Determination of Total Inorganic Nitrate Utilizing Collection of Nitric Acid on NaCl-Impregnated Filters, <u>Atmospheric Environment</u> 14(1), 137 (1980).

IGNATIUS N. TANG

Chemist

Education

National Taiwan University (B.S. in Chemical Engineering, 1955); University of North Dakota, (M.S. in Chemical Engineering, 1960); New York University (Graduate Studies in Chemical Engineering, 1961-64); State University of New York at Stony Brook (M.S. in Applied Mathematics, 1975; presently Ph.D. candidate in Applied Mathematics Department).

Research Interests

Aerosol chemistry; laser light scattering; solution thermodynamics; gas-phase reaction kinetics; high-temperature chemistry; applied inverse problems.

Professional
Affiliations

American Chemical Society.

Summary of
Experience

Current research activities include deliquescence properties of hygroscopic aerosols, gas-phase chemistry of sulfur compounds, chemical and phase equilibria for atmospheric trace gases, high-temperature fission-product vaporization and transport in HTGR, and hazardous chemical spills in water and on land; performed research in areas including theoretical and experimental studies of molecular clustering about atmospheric ions, nucleation phenomenon, radiation chemistry, and nuclear reactor safety studies.

Selected
Publications

I. N. Tang, Deliquescence Properties and Particle Size Change of Hygroscopic Aerosols, an invited presentation at the Symposium of Aerosol Generation and Exposure Facilities, ACS/CSJ Chemical Congress, Honolulu, Hawaii, April 1-6, 1979.

J. H. Lee, I. N. Tang and R. B. Klemn, Absolute Rate Constant for the Reaction of $O(^3P)$ with CH_3SCH_3 from 472 to 273 K, J. Chem. Phys. **72** (1980).

S. Aronson, M. Friedlander, I. Tang and H. R. Munkelwitz, The Interaction of CsI with High-chromium Alloys in the Presence of Oxygen, J. Inorg. Nucl. Chem. **41**, 1209-11 (1979).

ROGER L. TANNER	Chemist
Education	Pennsylvania State University (B.S. in Chemistry, 1964); University of Illinois (Ph.D. in Analytical Chemistry, 1969); Postdoctoral Fellow, 1972-73.
Research Interests	Analytical chemistry of trace substances in the environment; chemical and physical transformations of atmospheric aerosols and their gaseous precursors; derivatization-chromatography, chemical instrumentation.
Professional Affiliations	American Chemical Society and its Environmental Chemistry Division and New York Section; American Association for the Advancement of Science.
Committees	U.S. Environmental Protection Agency Advisory Board, Subcommittee on Mobile Source Emissions.
Summary of Experience	Analytical methods development applied to trace analysis of organic and inorganic species in the atmospheric environment, including substantial publications on analysis of aerosol sulfur and nitrogen compounds and their temporal and spatial variability in the ambient atmosphere; participation in several major field studies relating to atmospheric sulfur and nitrogen compounds including the EPA's RAPS program (1975), the GM-EPA Sulfate Dispersion Experiment (1975), the New York Aerosol Study (1976-79), DOE's MAP3S program (1976-present), the EPA-EKDA Intercomparison of Aerosol Samplers (1977), EPA Intercomparison of Aerosol Mass, Sulfur and Sulfate Measurement Techniques (1979), and the EPA Nitrate/Nitric Acid Intercomparison (1979).
Selected Publications	<p>R. Tanner, R. Fajer and J. Gaffney, Determination of Parts-per-Billion Concentrations of Aqueous Nitrate by Derivatization Gas Chromatography with Electron Capture Detection, <u>Analytical Chemistry</u> <u>51</u>(7), 865-70 (1979).</p> <p>R. L. Tanner, W. H. Marlow and L. Newman, Chemical Composition Correlations of Size-Fractionated Sulfate in New York City Aerosol, <u>Environmental Science and Technology</u> <u>13</u>(1), 75-78 (1979).</p> <p>R. L. Tanner, T. D'Ottavio, R. Garber and L. Newman, Determination of Ambient Aerosol Sulfur Using a Continuous Flame Photometric Detection System I. Sampling System for Aerosol Sulfate and Sulfuric Acid, <u>Atmospheric Environment</u> <u>14</u>(1), 121-27 (1980).</p>

ROBERT G. WILSON Chemist Associate III

Education Long Island University (B.S., 1951).

Research Interests Analytical chemistry, inorganic analysis.

Summary of
Experience Currently involved in analyses requiring atomic absorption spectrophotometry, emission spectroscopy, or mass spectrometry. Occasionally required to perform gravimetric or volumetric analyses. Have participated in collecting, preparing, and analyzing samples for the Atmospheric Diagnostic program; also have some experience in neutron activation and gamma pulse height analysis.

WING-TSAN WONG

Research Associate

Education

University of Toronto (B.A.Sc. in Physics, 1973);
Institute for Aerospace Studies, University of Toronto
(M.A.Sc. in Plasma Physics, 1974); Princeton University
(Ph.D. in Chemical Engineering, 1979).

Research Interests

Fluid mechanics; quantitative modeling in environmental science.

Summary of
Experience

Research Associate in a project sponsored by the U.S. Coast Guard to study the environmental impact of large-scale spills of toxic chemicals over land and in water; development of quantitative and experimental techniques to characterize aerosol particles.

Selected
Publications

P. C. Stangeby and W.-T. Wong, Recombination in Cold High Pressure Helium, Phys. Letts. 15A, 312 (1975).

W.-T. Wong and W. R. Schowalter, On the Effects of Hydrodynamic Stability During the Mixing of Two Fluids with Large Differences, AIChE 71st Annual Meeting, Miami Beach, FL, Nov. 12-16, 1978.

I. N. Tang, W.-T. Wong and H. R. Munkelwitz, A Fast Converging Inversion Method for the Analysis of Diffusion Battery Data, 12th Aerosol Technology Meeting, Detroit, MI, August 27-29, 1979.

LAND AND FRESHWATER ENVIRONMENTAL SCIENCES GROUP

G. R. HENDREY

GEORGE R. HENDREY	Ecologist
Education	University of Washington (B.A. in Zoology, 1966; M.S. in Water and Air Resources, Civil Engineering, 1970; Ph.D. in Aquatic Biology, 1973).
Research Interests	Limnology; effects of stress on ecosystems.
Professional Affiliations	American Society of Limnology and Oceanography; International Limnological Society; American Association for the Advancement of Science.
Committees	National Atmospheric Deposition Program (NADP); EPA-North Carolina State University Cooperative Agreement, Biological Effects Governing Board, Chairman, Aquatic Biology Committee; International Joint Commission (IJC) Research Advisory Board; Committee on Geochemical and Environmental Aspects.
Summary of Experience	Graduate study on nutrient assimilation kinetics of natural phytoplankton communities; comparative limnology of four lakes differing in trophic status; synoptic surveys of Norwegian lakes; studies of invertebrate tolerance to acids, Hydrobiology Group Leader for the Norwegian acid rain project; Visiting Lecturer and Senior Research Associate at Cornell University; experimental acidification of both artificial and natural streams; comparative limnology of three Adirondack Mountain lakes differing in acidity; consultant to EPA Environmental Criteria and Assessment Office on SO _x and particulates NAAQS document; Consultant to NAS on SO _x effects on lake biota; identification and mapping of areas of the U.S. sensitive to acidification.
Selected Publications	<p>G. R. Hendrey, Atikokan Power Plant Assessment: Impacts of Acidification on Aquatic Organisms. Chapter V, S.J. Eisenreich and B. Coffin, Editors, <u>Report of the Atikokan Power Plant Environmental Assessment Workshop</u>. University of Minnesota, Minneapolis (1978).</p> <p>G. R. Hendrey, R. J. Hall and G. E. Likens, Experimental Stream Acidification Effects on Benthic Algal Productivity, <u>Amer. Soc. Limnol. Oceanogr. Annual Meeting</u>, Stony Brook, NY, June 1979.</p> <p>G. R. Hendrey, J. N. Galloway, S. A. Norton, C.L. Schofield, P. W. Schaffer and D. A. Burns, Geological and Hydrochemical Sensitivity of the Eastern United States to Acid Precipitation, EPA-600/3-80-024, January 1980.</p> <p>G. R. Hendrey, Effects of Acidity on Primary Productivity in Lakes: Phytoplankton, D. Shriner, C. R. Richmond, and S. E. Lindberg, Editors, <u>Atmospheric Sulfur Deposition: Environmental Impacts and Health Effects</u>. Ann Arbor Science Press, Ann Arbor, MI (1980).</p>

H. LEE CONWAY	Associate Scientist
Education	Oregon State University (B.A. in General Science, 1967); University of Washington (M.S. in Chemical Oceanography, 1970; Ph.D. in Chemical Oceanography, 1974).
Research Interests	Micronutrient and trace metal recycling dynamics in aquatic environments; effects of acidification on freshwater biota; micronutrient uptake kinetics of freshwater and marine algae.
Professional Affiliations	American Society of Limnology and Oceanography; International Association for Great Lakes Research; American Geophysical Union.
Committees	Advisory Panel for New York Sea Grant Institute.
Summary of Experience	Teaching Assistant, University of Washington, 1967-68; Research Assistant, University of Washington, 1968-73; Instructor, University of Washington, Spring 1971; Instructor, University of Washington, Fall 1973; Post-doctoral Appointee, University of Washington, 1974; Assistant Ecologist, Argonne National Lab., 1974-79; Associate Scientist, Brookhaven National Laboratory, 1979-present. Participated in the following cruises sponsored by either the International Biological Program (IBP) or the International Decade of Ocean Exploration (IDOE): PISCO, Peru, 1969; MESCAL I, Baja California, 1972; OUTFALL I, Los Angeles, California, 1972; MESCAL II, Baja California, 1973; JOINT I, Northwest Africa, 1974; JOINT II, Peru, 1977. Participated in the following cruises in the New York Bight sponsored by Brookhaven National Laboratory and the U.S. Department of Energy: ACE II, 1969; ACE III, 1977; ACE IV, 1978. Chief Scientist for twelve Lake Michigan cruises, 1974-76.
Selected Publications	<p>H. L. Conway and S. C. Williams, Sorption of Cadmium and its Effect on Growth and the Utilization of Inorganic Carbon and Phosphorus of Two Freshwater Diatoms, <u>J. Fish. Res. Board Can.</u> <u>36</u>(5), 579-86 (1979).</p> <p>H. L. Conway and T. E. Whitledge, Distribution, Fluxes, and Biological Utilization of Inorganic Nitrogen During a Spring Bloom in the New York Bight, <u>J. Mar. Res.</u> <u>37</u>(4), 657-68 (1979).</p> <p>D. N. Nelson and H. L. Conway, Effects of the Light Regime in Nutrient Assimilation by Phytoplankton in the Baja California and Northwest Africa Upwelling Systems, <u>J. Mar. Res.</u> <u>37</u>(2), 301-18 (1979).</p>

AROKIASAMY J. FRANCIS Associate Microbiologist

Education Annamalai University (B.Sc. in Agriculture, 1963; M.Sc. in Agriculture-Soil Microbiology, 1965); Cornell University (Ph.D. in Microbiology, 1971).

Research Interests Effect of energy related activities on soil and aquatic microbial processes; microbial transformation of radioactive waste; effect of organics on migration of radionuclides; microbial uptake and biaccumulation of heavy metals; persistence of organo metals and organo radionuclides in the environment; biodegradation of pesticides and organic pollutants; nitrogen transformation.

Professional Affiliations American Society for Microbiology; American Nuclear Society.

Summary of Experience Current research deals with the effect of acid rain on organic matter decomposition in aquatic and terrestrial ecosystems. Conducted research on characterization of organics in leachates from radioactive waste burial sites; microbial transformation of radioactive waste and organized a round table symposium on "Microbial Aspects of Transuranic and other Radioactive Wastes" (convenor). His previous experience at Stanford Research Institute involved studies on the microbiological degradation of military standard pesticide formulations, and at Cornell University on symbiotic nitrogen fixation in legumes and life detection by GC/MS of microbial metabolites.

Selected Publications A. J. Francis, R. J. Spanggord, G. I. Ouchi and N. Bohonos, Cometabolism of DDT Analogs by a *Pseudomonas* sp., Appl. Environ. Microbiol. 35, 364-67 (1978).

 A. J. Francis, C. Iden, B. Nine and P. Columbo, Organic Compounds Identified in Trench Leachates from Low-Level Radioactive Waste Disposal Sites, Trans. Am. Nuc. Soc. 32, 112-14 (1979).

 A. J. Francis, S. Dobbs, R. F. Doering and P. Columbo, Microbial Production of Tritiated and Carbon-14 Methane from Radioactive Wastes, Trans. Am. Nuc. Soc. 33, 156-57 (1979).

 A. J. Francis, D. Olson and R. Bernatsky, Effect of Acidity on Microbial Processes in a Forest Soil, BNL 26808, 1979.

NICHOLAS F. GMUR	Biology Associate III
Education	McGill University (B.Sc. in General Science, 1968); University of Michigan (M.S. in Biology, 1975).
Research Interests	Effects of dry and wet acid deposition on field crop and forest ecosystems.
Summary of Experience	Peace Corp Volunteer (1968-71), active as head of secondary school science department and biology teacher in Ghana, West Africa. Greenhouse and environmental chamber studies determining the nature and extent of visible foliar injury to pinto beans, poplar, sunflower, spiderwort, and oak due to simulated acid precipitation. Design and implementation of aerosol exposure/plant growth chamber and related research to determine the separate and combined effects of various sulfate aerosols, simulated acid precipitation, and environmental variables as various crop plants.
Selected Publications	<p>L. S. Evans, N. F. Gmur and J. J. Kelsh, Perturbations of Upper Leaf Surface Structures by Simulated Acid Rain, <u>Environ. and Exp. Bot.</u> <u>17</u>, 145-49 (1977).</p> <p>L. S. Evans, N. F. Gmur and F. DaCosta, Leaf Surface and Histological Perturbations of Leaves of <u>Phaseolus vulgaris</u> and <u>Helianthus annuus</u> After Exposure to Simulated Acid Rain, <u>Amer. J. Bot.</u> <u>64</u>(7), 903-13 (1977).</p> <p>L. S. Evans, N. F. Gmur and F. DaCosta, Foliar Response of Six Clones of Hybrid Poplar to Simulated Acid Rain, <u>Phytopathology</u> <u>68</u>, 847-56 (1978).</p>

ROLAND F. HAUTSCH Oceanography Associate IV

Education Southampton College (B.S. in Marine Biology, 1976).

Research Interests Monitoring effects of acid rain on some Adirondack lakes (ALP).

Summary of
Experience Collection and identification of oceanographic zooplankton samples. Computer programming ALP data and carbon, nitrogen, hydrogen analysis of ALP samples.

EDWARD F. LANDRY Associate Scientist

Education State College at Boston (B.A. in Biology, 1968);
University of New Hampshire (Ph.D. in Microbiology,
1975); University of Rochester (Postdoctoral Fellow in
Department of Radiation Biology and Biophysics,
1975-76).

Research Interests Fate of human viruses during land treatment of sewage;
accumulation of pathogenic human viruses in shellfish
growing in the sewage-polluted environments; the muta-
genicity of metal-based compounds; the health effects of
compounds used in the photovoltaic industry.

Professional American Society for Microbiology.
Affiliations

Summary of Involved in the detection and assessment of the potential
Experience health hazards posed by the presence of human viruses in
the environment. Demonstrated an effective method for
controlling the movement of human viruses through the
soil during the land application of sewage effluents,
minimizing groundwater contamination. Developed new
methods for detecting enterovirus in soils and sewage
effluents. Studied the methods of uptake and depuration
of human viruses by shellfish and the relationship of
virus in shellfish and sediments. Recently developed
sensitive methodologies for detection of numerous viruses
in shellfish. Assisted in designing a health effects
research program for the photovoltaic industry.

Selected E. F. Landry, J. M. Vaughn, M. Z. Thomas and
Publications C. A. Beckwith, Adsorption of Enterovirus to Soil Cores
and Their Subsequent Elution by Artificial Rainwater,
Applied and Environmental Microbiology 38(4), 680-87
(October 1979).

J. M. Vaughn, E. F. Landry, T. J. Vicale and M. C. Dahl,
Modified Procedure for the Recovery of Naturally
Accumulated Poliovirus from Oysters, Applied and
Environmental Microbiology 38(4), 594-98 (October 1979).

E. F. Landry, J. M. Vaughn, M. Z. Thomas and
T. J. Vicale, Efficiency of Beef Extract for the Recovery
of Poliovirus from Wastewater Effluents, Applied and
Environmental Microbiology 36(4), 544-48 (October 1978).

KEITH F. LEWIN

Biology Associate III

Education

Cornell University, College of Agriculture and Life Science (B.S., 1974).

Research Interests

Effects of acid precipitation and other environmental pollutants on natural and managed terrestrial ecosystems.

Professional Affiliations

New York State Cooperative Extension.

Summary of Experience

Production of vegetable and field crops on a commercial basis; design, fabrication, and adaptation of equipment to aid in achieving research objectives; design, implementation, and analysis of growth chamber, greenhouse, and field scale experiments.

Selected Publications

L. S. Evans and K. F. Lewin, Effects of Simulated Acid Rain on Growth and Yield of Soybeans and Pinto Beans, Proceedings of Potential Environmental and Health Effects of Atmospheric Deposition, Oak Ridge National Laboratory, Oct. 14-18, 1979 (D. S. Shriner, C. R. Richmond, and S. E. Lindborg, eds.), Franklin Institute Press, Philadelphia, PA.

L. S. Evans, K. F. Lewin and F. A. Vella, Effect of Nutrient Medium pH on Symbiotic Nitrogen Fixation by Rhizobium leguminosarum and Pisum sativum, BNL 25231, 1979.

HELEN L. QUINBY	Biology Associate III
Education	Baldwin-Wallace College (B.S. in Biology, 1967).
Research Interests	Microbial Ecology.
Professional Affiliations	American Society of Limnology and Oceanography.
Summary of Experience	<p>With Battelle four years managing technical organization for several environmental impact statements for coastal power plant construction in New England and performing zooplankton and phytoplankton enumerations, water chemistries, histochemistry, and field samplings. With the Woods Hole Oceanographic Institution, six years assisting Stanley Watson, senior microbiologist. Developed an adenosine triphosphate assay for open ocean and bottom sediments, worked with the lipopolysaccharide assay and an epifluorescence technique for direct counts of bacteria, and used these techniques on several sea cruises. Also served as a qualified SCUBA diver for the Institution. For two other investigators, performed chlorine toxicity studies on marine phytoplankton and did radiochemical analyses on marine organisms for ^{239}Pu, ^{238}Pu, and ^{137}Cs. At BNL since July 1979, working on acid rain effects on aquatic bacterial metabolism and populations.</p>
Selected Publications	<p>J. C. Goldman and H. L. Quinby, Recovery Potential of Phytoplankton After Passage Through Coastal Power Plant Entrainments, <u>Journal of Water Pollution Control Federation</u> 51(7), 1816-23 (July 1979).</p> <p>S. Watson, T. Novitsky, H. L. Quinby and F. Valois, Determination of Bacterial Number and Biomass in the Marine Environment, <u>Applied and Environmental Microbiology</u> 33(4), 940-46 (1977).</p>

JAMES M. VAUGHN

Associate Scientist

Education

Rhode Island College (B.A. in Biology, 1968); University of New Hampshire (Ph.D. in Microbiology, 1972); Post-doctoral Fellow, Woods Hole Oceanographic Institution, 1972-74.

Research Interests

Environmental virology; methods development for the detection of metal mutagens; biological and chemical toxicity testing of emissions and effluents from energy process technologies (e.g., solar photovoltaic industry).

Professional Affiliations

American Society for Microbiology; New England Estuarine Research Society; Society of Sigma Xi; International Ozone Institute.

Summary of Experience

Head of laboratory group responsible for conduct of a variety of virological studies including: The fate of human pathogens in wastewater-aquaculture systems; transport and distribution of human viruses in land application and wastewater recharge operations; human virus interactions in marine environments, with special reference to their uptake by edible marine bivalve molluscs; the fate of human viruses in tertiary wastewater treatment systems; virus transport in urban stormwater runoff; horizontal migration of human viruses entrained in the groundwater aquifer. Research group has recently become involved in studies of health hazards posed by various energy-related processes. Research programs in this area include: Development of more sensitive in vitro testing methods for the detection of metal-based mutagens; and a field testing program for assessing the likely health hazards associated with the manufacture and use of solar photovoltaic devices.

Selected Publications

J. M. Vaughn, E. F. Landry, T. J. Vicale and M. C. Dahl, Modified Procedure for the Recovery of Naturally Accumulated Poliovirus from Oysters, Applied and Environmental Microbiology 38(4), 594-98 (October 1979).

J. M. Vaughn, E. F. Landry, T. J. Vicale, M. Z. Thomas and W. F. Penello, A Survey of Human Enterovirus in Fresh and Marine Surface Waters on Long Island, Applied and Environmental Microbiology 38(4), 290-96 (July 1979).

E. F. Landry, J. M. Vaughn, M. Z. Thomas and C. A. Beckwith, Adsorption of Enterovirus to Soil Cores and Their Subsequent Elution by Artificial Rainwater, Applied and Environmental Microbiology 34(4), 680-87 (October 1979).

THOMAS J. VICALE	Biology Associate IV
Education	Suffolk County Community College (A.S., 1974); University of Miami (B.S., 1976).
Research Interests	Virus survival in seawater; marsh/pond system; concentration of enteroviruses from large volumes of treated sewage, well water, and surface waters; fate of human viruses in groundwater recharge systems (meadow/marsh/pond, sewage recharge basins).
Summary of Experience	Presently interested in effects of ecological conditions on the bioaccumulation of enteric viruses in shellfish; in development of improved enterovirus detection methods/techniques in oysters; and oyster depuration of poliovirus (LSC).

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OCEANOGRAPHIC SCIENCES DIVISION

J. J. WALSH

JOHN J. WALSH

Oceanographer

Education

Harvard College (A.B. in Biology, 1964); University of Miami (M.S. in Marine Sciences, 1968, Ph.D. in Marine Sciences, 1969); University of Washington (Postdoctoral Fellow, 1969-70).

Research Interests

Aquatic ecology, ecosystems analysis, eastern and western boundary currents, coastal oceanography.

Professional Affiliations

American Association of Science; American Society of Limnology and Oceanography.

Committees

Executive Committees, Coastal Upwelling Ecosystem Analysis (CUEA) Program (1971-75) and Processes and Resources of the Bering Sea (PROBES) Program (1975-80), U.S. Nat. Academy Committee for the International Biological Program (IBP) in 1972-73, BNL Council (1979-82).

Summary of Experience

Dr. Walsh studied coastal upwelling off Baja California, Oregon, Northwest Africa, and Peru as a Research Assistant Professor at the University of Washington (1970-75). As Head of the Oceanographic Sciences Division at BNL (1975-80), Dr. Walsh has studied ecosystem dynamics of the Mid-Atlantic Bight and the Bering Sea. Using a combination of numerical models and field data, Dr. Walsh has studied the energy-related impacts of the northeast coastal zone, e.g. the sources of primary production and factors leading to interruption of carbon flow to the higher trophic levels from Cape Hatteras to Georges Bank. Dr. Walsh is also an adjunct Professor at the State University of New York at Stony Brook and a member of the editorial board of the Journal of Plankton Research.

Selected Publications

A. G. Tingle and D. A. Dieterle and J. J. Walsh, Perturbation Analysis of the New York Bight, in Ecological Processes in Coastal and Marine Systems, R. J. Livingston, ed., Plenum Press, p. 395-435 (1979).

P. G. Falkowski, T. S. Hopkins, and J. J. Walsh, An Analysis of Factors Affecting Oxygen Depletion in the New York Bight, J. Mar. Res. 38(3), 425-58.

J. J. Walsh, T. E. Whitledge, W. E. Esaias, R. L. Smith, S. A. Huntsman, and B. R. DeMendiola, The Spawning Habitat of the Peruvian Anchovy, Engraulis ringens, Deep-Sea Res. 27, 1-27 (1980).

WILLIAM J. BEHRENS Oceanography Associate

Education State University of New York at Binghamton (B.A. in Biology, 1974); University of Manchester, England, Visiting student in zoology, 1973-74; State University of New York at Stony Brook (M.S. in Marine Environmental Sciences, 1978).

Research Interests Trace metals in marine organisms and sediments; chemistry of sulfur in sea water; statistics and data processing; fisheries management.

Professional Affiliations New England Estuarine Research Society.

Summary of Experience Responsible for design and logistics of a sampling program to develop a sulfur budget for a salt marsh. Also involved in chemical methods development, equipment design and data processing (MBL, Woods Hole). M.S. thesis on the behavior of trace metals in transplanted hard clams. Instructor of Physical Oceanography at Southampton College, 1977-78. Co-investigator on sediment mapping project, and participant in a dye tracer study of circulation patterns in Great South Bay, NY. Responsible for primary productivity measurements and stood FTD, plankton sampling, hydrography and chlorophyll watches on research cruises. Attended a course in marine ecology in Roscoff, France and developed methods for investigating the feeding behavior of Macoma balthica (University of Manchester, England).

Selected Publications G. T. Greene, A. C. F. Mirchel, W. J. Behrens and D. S. Becker, Surficial Sediments and Seagrasses of Eastern Great South Bay, NY. Marine Sciences Research Center, SUNY at Stony Brook, NY. Special Report No. 12, Reference No. 77-9, 1978.

MICHAEL J. DAGG	Oceanographer
Education	Mount Allison University (B.Sc. in Biology, 1966); University of Victoria (M.Sc. in Marine Biology, 1969); University of Washington (Ph.D. in Biological Oceanography, 1975).
Research Interests	Physiological processes (especially feeding and reproduction) of zooplankton; zooplankton ecology.
Professional Affiliations	American Society of Limnology and Oceanography; American Association for the Advancement of Science; Ecological Society of America.
Summary of Experience	Participation in planning and research aboard major oceanographic cruises to Japan, Peru, Alaska, Canadian West Coast, and the NE United States. Laboratory and field research into aspects of zooplankton feeding, egg production, and population biology in Peru, the Bering Sea, and the NE United States. Responsible for the scientific organizations of a major zooplankton field-study to the New York Bight. Adjunct associate professor at MSRC at Stony Brook. Teaching graduate level courses in zooplankton ecology, team-teaching course in Marine Topics, and supervising a Ph.D. candidate at MSRC at Stony Brook.
Selected Publications	<p>M. D. Dagg, Estimated, <u>In Situ</u>, Rates of Egg Production for the Copepod <u>Centropages typicus</u> (Kroyer) in the New York Bight, <u>Journal of Experimental Marine Biology and Ecology</u> <u>34</u>, 183-96 (1978).</p> <p>M. J. Dagg, T. Cowles, T. Whittedge, S. Smith, S. Howe and D. Judkins, Grazing and Excretion by Zooplankton in the Peru Upwelling System During April 1977. <u>Deep-Sea Research</u> <u>27A</u>, 43-59 (1979).</p> <p>M. J. Dagg and D. Grill, Natural Feeding Rates of <u>Centropages typicus</u> Females in the New York Bight. <u>Limnology and Oceanography</u> <u>25</u>, 599-611 (1980).</p>

DWIGHT A. DIETERLE Computer Science Analyst

Education North Dakota State University (B.S. in Zoology, 1965);
 San Jose State University (M.S. in Meteorology, 1979).

Research Interests Computer models in environmental simulation; automated
 contouring systems.

Summary of
 Experience Primary experience has been in assisting in the construc-
 tion of computer models for environmental pollution prob-
 lems including pollutant transport and dispersion in sea-
 breeze circulations, current and trajectory models for
 the transport of oil and debris in the ocean, and coupled
 water transport and biological models in the simulation
 of continental shelf ecosystems. This activity has devel-
 oped a capability in computer programming methods, numer-
 ical-finite difference-techniques, and computer graphics.

Selected
 Publications D. A. Dieterle and A. G. Tingle, A Numerical Study of
 Mesoscale Transport of Air Pollutants in Sea-breeze
 Circulations, Proc. Third Symp. on Atmospheric
 Turbulence, Diffusion, and Air Quality, Raleigh, NC,
 1976.

 A. G. Tingle, D. A. Dieterle and J. J. Walsh,
 Perturbation Analysis of the New York Bight, in: Coastal
 Ecological Processes, Plenum Press (1979).

 J. J. Walsh, C. D. Wirick, A. J. Tingle and
 D. A. Dieterle, Environmental Constraints on Larval Fish
 Survival in the Sea. Proc. ICES Symposium on Early Life
 History of Fish ICES/ELH Symp./M:F, Woods Hole, MA, 1979.

PAUL G. FALKOWSKI	Oceanographer
Education	City College of the City University of New York (B.S. in Biology, 1972; M.A. in Biology, 1973); University of British Columbia (Ph.D. in Biology, 1975); Postdoctoral Fellow, University of Rhode Island, 1975-76.
Research Interests	Phytoplankton physiological ecology and biochemistry.
Professional Affiliations	American Society of Limnology and Oceanography; American Society of Plant Physiology; Phycological Society of America, Sigma Xi.
Committees	Chairman of BNL Symposium Committee in Biology, 1980.
Summary of Experience	Responsible for the development of experimental models of phytoplankton photosynthesis and productivity in coastal waters. Have worked and continue to work on laboratory and field methods of estimating phytoplankton responses to various environmental parameters. Am involved in various aspects of biochemical ecology within BNL's Oceanographic Sciences Division, including: The characterization of phytoplankton photosynthetic pigments, analysis of zooplankton digestive metabolism, and kinetics of carbon flow in primary producers. Have developed methods of analysis of coral reef symbiotic systems with colleagues in Israel. Have worked on OTEC projects for environmental assessment in Hawaii. Chairman of BNL's Symposium Committee in Biology, 1980.
Selected Publications	<p>P. G. Falkowski, D. P. Riper and T. G. Owens, Chlorophyll Turnover in <u>Skeletonema costatum</u>, a Marine Plankton Diatom, <u>Plant Physiol.</u> <u>64</u>, 49-54 (1979).</p> <p>P. G. Falkowski, Nitrogen Assimilation in Lower Plants, in: Nitrogen in the Environment, Vol. 2, D. R. Nielsen and J. G. MacDonald, eds., pp. 143-55. Academic Press, New York (1978).</p> <p>P. G. Falkowski and T. G. Owens, The Effects of Light Intensity on Photosynthesis and Dark Respiration in Six Species of Marine Phytoplankton, <u>Mar. Biol.</u> <u>45</u>, 289-95 (1978).</p>

DAVID W. GRILL Oceanography Associate

Education City College of New York (B.A., 1968); State University
of New York at Stony Brook, Marine Sciences Research
Center, M.S. pending.

Research Interests Zooplankton ecology.

Summary of Conducted zooplankton feeding experiments, gut fluores-
Experience cence, and particle concentration profiles on the follow-
ing programs:

COEA (Peru, 1976, 1977)

PROBES (Bering Sea, 1979)

ACE (N.Y. Bight, 1976, 1977, 1978).

THOMAS S. HOPKINS	Oceanographer
Education	University of Southern California (B.A. in Mathematics, 1958); University of California, Berkeley (B.S. in Astronomy, 1964); University of Washington (M.Sc. in Oceanography, 1967; Ph.D. in Physical Oceanography, 1971).
Research Interests	Circulation on continental shelves; water mass analysis; dispersion of biochemical properties; air-sea interaction; biophysical interfacing.
Professional Affiliations	American Geophysical Union; Fulbright Alumni Association; Explorers Club; Scientist Zoological Station, Naples; Adjunct Professor SUNY Stony Brook, NY.
Summary of Experience	Responsible for the first moored current meter program on the Washington Continental Shelf (2 years, 15 cruises). Co-organized and administered a multidisciplinary research project to maintain and analyze effects of sewage effluent on the Saronikos Gulf Ecosystem (3 years, 20 cruises, supervised 30 people). Advised World Health Organization, Athens, on pollution research activists. Workshop on the history and ecology of Milos Island, Greece 1973. Chairman of the first UNESCO Mediterranean Modeling Workshop, Alexandria, Egypt, 1974. Co-chairman of the second UNESCO Mediterranean Modeling Workshop, Dubrovnik, Yugoslavia, 1976. Helped organize and supervise multidisciplinary marine ecology research program in Naples, Italy; program is ongoing through grants of Italian National Research Council and U.S. NSF(1975-present, 8 cruises). Research Scientist, Bigelow Laboratory for Ocean Sciences (1975-77) (supervise physical section, 15 cruises). Oceanographer, Brookhaven National Laboratory, 1977 to present; supervise physical section in wide variety of coastal basic research and development and interact directly with scientists from several government agencies and universities.
Selected Publications	<p>T. S. Hopkins, Physical Processes in Mediterranean Estuaries. in: <u>Transport Processes in Estuarine Environments, Seventh Belle W. Baruch Institute for Marine Biology and Coastal Research Symposium, Georgetown, South Carolina, May 1976, B. Kjerfve, Editor. pp. 269-310, 1978.</u></p> <p>T. S. Hopkins, The Gulf of Maine Intermediate Water, <u>J. Mar. Res.</u> 37(1) (1979).</p>

PETER V.Z. LANE

Oceanography Associate

Education

Southampton College of Long Island University (B.S. in Marine Sciences with Biology concentration, 1979).

Research Interests

Methods of plankton analysis; spatial and temporal distribution of zooplankton and chemical and biological effects of such distribution including effects on the food web of marine ecosystems; coastal and estuarine management.

Summary of
Experience

Specialized education included three months at sea aboard the Schooner Harvey Gamage surveying biology of coastal and estuarine waters of the Atlantic coast from Rockland, Maine to New Providence, Bahamas. A one-month intensive course involving the study of the physical, chemical and biological interactions of a Long Island estuary, a four-month internship study at BNL involving analysis of zooplankton samples and two oceanographic cruises involving sampling of zooplankton. Employment at BNL involving sorting and identification of zooplankton, chlorophyll analysis, data reduction and figure illustration.

JAMES G. LOFSTRAND	Oceanography Associate
Education	Wabash College (B.A. in Mathematics, 1965); Polytechnic Institute of New York (MSEE in Computer Science, 1980).
Research Interests	Analysis and design of scientific information systems; software engineering; oceanographic data acquisition systems.
Professional Affiliations	Association for Computing Machinery.
Summary of Experience	Oceanographic Associate and Systems Analyst, BNL 1977-present. Oceanographic Associate and Scientific Programmer, Institute of Oceanographic & Fisheries Research, Athens, Greece 1972-75. Systems Analyst, The Boeing Company 1965-72.
Selected Publications	<p>J. G. Lofstrand, Oceanographic Data from Moored Instrumentation, August-September 1978, BNL 27582, 1980.</p> <p>J. G. Lofstrand, Oceanographic Data from Moored Instrumentation, May-June 1977, BNL 51057, 1979.</p> <p>J. G. Lofstrand, An Analytic Description of the Bottom Topography of the Saronikos Gulf; IOKAE, Athens, Greece, 1974.</p>

STEWART C. MALLOY Oceanography Associate

Education Wesleyan University (B.A. in Biology, 1971); Dalhousie University (M.Sc. in Oceanography, 1975).

Research Interests Nutrient distribution and recycling on the continental shelf; microbial degradation of organic matter in ocean environments; diseases of invertebrates.

Professional Affiliations American Society of Limnology and Oceanography.

Summary of Experience Involved in the collecting and analyzing of seawater nutrient samples to determine interaction of physical and biological parameters on nutrient distribution. Working on technical manual describing automated chemical analysis in seawater and the interfacing of a minicomputer to an autoanalyzer. Has evaluated the effects of pollution and handling on the incidence of disease in lobsters.

Selected Publications S. C. Malloy, Bacteria Induced Shell Disease of Lobsters, Journal of Wildlife Diseases, 12, 2-10 (1978).

S. C. Malloy and F. Barvenik, Kinetic Patterns of Microbial Amino Acid Uptake and Mineralization in Marine Waters, Estuarine and Coastal Marine Science 8, 241-50, (1979).

THOMAS G. OWENS	Oceanography Associate
Education	University of Washington (B.S. in Chemical Oceanography, 1974; M.S. in Chemical Oceanography, 1976).
Research Interests	Ecological and physiological aspects of phytoplankton growth and adaptation in the marine environment.
Professional Affiliations	American Society of Plant Physiologists; Phycological Society of America.
Summary of Experience	Participant in 17 major oceanographic expeditions involving acquisition and processing of samples for biological, chemical, and physical parameters; experience as Chief Scientist and Cruise Leader on several oceanographic cruises. Laboratory experience in culturing and maintenance of bacteria, phytoplankton and zooplankton, enzyme analysis, protein purification, spectral analysis of plant pigments, oxygen electrodes, determination of cellular components, and analysis of biochemical and physiological data.
Selected Publications	<p>T. G. Owens, D. M. Riper, and P. G. Falkowski, Studies of Delta-Aminolevulinic Acid Dehydrase from <u>Skeletonema costatum</u>, a Marine Plankton Diatom, <u>Plant Physiol.</u> <u>62</u>, 516-21 (1978).</p> <p>P. G. Falkowski and T. G. Owens, Effects of Light on Photosynthesis and Dark Respiration in Six Species of Marine Phytoplankton. <u>Mar. Biol.</u> <u>45</u>, 289-95 (1978).</p> <p>D. P. Riper, T. G. Owens, and P. G. Falkowski, Chlorophyll Turnover in <u>Skeletonema costatum</u>, a Marine Plankton Diatom, <u>Plant Physiology</u> <u>64</u>, 49-54 (1979).</p>

EUGENE T. PREMUZIC Senior Research Associate

Education University of Birmingham, England (B.Sc., 1954, M.Sc., 1955); University of British Columbia (Ph.D. in Biochemistry, 1957); University of Sussex, England (D. Phil. in Chemistry, 1967).

Research Interests Organic chemistry of natural products, stereochemistry, conformational analysis, organic geochemistry, chemistry of primitive organisms.

Professional
Affiliations American Chemical Society; Can. Inst. Chem., Fellow; Chem. Soc. (U.K.), Sigma Xi.

Summary of
Experience Lecturer, U. British Columbia, 1957-63; Senior Lecturer, 1963-65; Research Fellow, U. of Sussex, 1965-67; Senior Research Scientist, Associate Professor, and Director of Admissions, New England Medical Institute, 1967-71; Senior Scientist, International Biotoxicological Center, World Life Research Institute, California 1971-72; Visiting Professor and Special Advisor, University of Baja California. Encenada, Mexico, 1970-71, Special Consultant, Environmental Consortium, University of Redlands, California, 1970-71; Consultant, MD Associates, California, 1971; Environmental Improvement Committee - A.C.S. Nassau-Suffolk Subsection, N.Y. 1972; Member Task Force National Committee on Marine Biomedicinals, 1974; Senior Research Scientist, NY Ocean Science Lab., Montauk NY, 1972-76; Consultant, 1976-77; Senior Research Associate BNL, 1977-present; Adjunct Professor, Fordham University 1973-74; Professor, Southampton College, Long Island University, 1975-present.

Selected
Publications J. S. Gaffney, B. Manowitz and E. T. Premuzic, On the Usefulness of Sulfur Isotope Ratios in Crude Oil Correlations, Geochim. et Cosmochim. Acta 44, 135-39 (1980).

E. T. Premuzic, Organic Carbon and Nitrogen in the Top Sediments of World Oceans and Seas: Distribution and Relationship to Bottom Topography, BNL 51084, 1979.

GILBERT T. ROWE	Oceanographer
Education	Texas A&M University (B.S. in Zoology, 1964, M.S. in Oceanography, 1968), Duke University (Ph.D. in Zoology, 1968), Postdoctoral Fellow, Woods Hole Oceanographic Institution, 1968-69.
Research Interests	Ecology of marine benthos; sources utilization and cycling of organic matter; regeneration of inorganic nutrients, respiratory processes and secondary production by benthic organisms, organic geochemistry of marine sediments; systems ecology and numerical simulation of natural ecosystems.
Professional Affiliations	AAAS; New York Academy of Science; American Society of Limnology and Oceanography; Honorary Deep-Sea Biology Society; Editorial Board - Journal of Marine Research; Editorial Board - Marine Geotechnology; Editor - Vol. 8, <u>The Sea</u> ; Deep-Sea Biology; Editorial Board - Biological Oceanography; Research Associate - American Museum of Natural History.
Committees	Committee on Ocean Dumping, U.S. Dept. of State.
Summary of Experience	Responsible for assessing the function of communities of organisms of the ocean bottom in the cycling of elements and energy in oceanic ecosystems; has served on a number of <u>ad hoc</u> panels and committees (federal funding and regulatory agencies and congressional hearings) concerned with such subjects as funding priorities for national facilities and oceanic pollutant impacts; serves on editorial boards of three scientific journals and is presently serving as editor of Vol. 8 of <u>The Sea</u> , entitled Deep-Sea Biology; has extensive experience in the use and development of undersea technology and photography and presently serves as Diving Supervisor for the Division of Oceanographic Sciences; has served as Principal Investigator or Co-principal Investigator on a number of research projects funded by NSF, ONR and NOAA, while on the staff of the Woods Hole Oceanographic Institution and is now the Principal Investigator of a component of the Coastal Upwelling Ecosystem Analysis Program; has served as an advisor to OAS in Ecuador and visiting professor (summers) at the Duke University Marine Laboratory. Dr. Rowe coauthored a book published in 1973 on deep-sea ecology.
Selected Publications	G. T. Rowe and W. D. Gardner, Sedimentation Rates in the Slope Water of the Northwest Atlantic Ocean Measured Directly with Sediment Traps, <u>Journal of Marine Research</u> 37, 581-600 (1979).

Gilbert T. Rowe (Cont'd.)

G. T. Rowe and R. Haedrich, The Biota and Biological Processes of the Continental Slope. S.E.P.M. Special Publication No. 27, Continental Slopes, Edited by O. Pilkeyard and L. Doyle, p. 49-59 (1979).

G. T. Rowe, Monitoring with Deep Submersibles, in: Monitoring the Marine Environment, D. Nichols, ed., pp. 75-85, Inst. of Biology, London (1979).

SHARON L. SMITH	Oceanographer
Education	The Colorado College (B.A., 1967); University of Auckland (M.Sc. II. 1, 1969); Duke University (Ph.D., 1975); Post-doctoral Fellow, Dalhousie University, 1975-78.
Research Interests	Ecology of zooplankton; nutrient cycling; upwelling ecosystems.
Professional Affiliations	American Society of Limnology and Oceanography (Officer); American Society for the Advancement of Science.
Summary of Experience	Supervising biological investigation of the impact of nuclear power plants in the northeastern U.S. and writing technical reports; conducting research on zooplankton in an estuary and upwelling ecosystems including nutrient cycling, assimilation, ingestion, growth and species composition; studies of spatial structure in zooplankton; descriptive biological oceanography of Somali coastal waters as a function of monsoonal currents; studies of population dynamics and spatial structure of zooplankton in the Bering Sea.
Selected Publications	<p>S. L. Smith and B. K. Hall, Transfer of Radioactive Carbon within the Copepod <u>Temora Longicornis</u>, <u>Marine Biology</u> 55, 277-86 (1980).</p> <p>S. L. Smith, The Role of Zooplankton in the Nitrogen Dynamics of a Shallow Estuary, <u>Estuarine and Coastal Marine Science</u> 7, 555-65 (1978).</p>

IRA SNAPPER

Computer Science Analyst

Education

Staten Island College (A.A., 1966); Brooklyn College (1966); New York University (Programming Electronic Data Processing Systems and Systems Analysis Concepts, 1968); IBM Education Center (Small Binary Computers System Hardware and Software, 1970); MRI Austin, Texas (Data Base Theory, 1976).

Research Interests

Psychopharmacology and computer related studies with data bases of effects illegal drugs have on the mind; electronic warfare (designing computer programs for defense installations and aircraft); scientific programming related to the possibility of farming the ocean.

Summary of
Experience

Software experience with Fortran and BAL under IBM 360/40 DOS, and IBM 370/155 OS; system generations and system programming with IBM 1800 MPX, IBM 1130 TSX; programming and system conversions with COBOL and PL/I under UNIVAC, and Honeywell equipment; assembly language under the Real Time Disk Operating System (RDOS) of Data General's Super Nova mini-computer. Present data processing interests center on maintaining the up-to-date library, which I have created, of all oceanographical data collected by every principal investigator in the department, as well as on systems programming via the linkage between three totally unique computer systems, creating a handshaking routine which will allow oceanographic cruise and buoy data to flow continuously through a H.P. 45 to a DEC P.D.P. data base modified to link with a CDC 7600/6600 system to allow for both cruise and buoy data to be published efficiently.

ANDREW STODDARD	Jr. Research Associate
Education	Manhattan College (Bachelor of Civil Engineering, 1969; Masters in Environmental Engineering and Science, 1970); University of Washington (Ph.D. candidate in Civil Engineering, 1975).
Research Interests	Application of mathematical modeling and simulation techniques in assessment of the impact of water pollution control and water resource management activities upon the ecology of estuarine and coastal waters.
Professional Affiliations	American Society of Limnology and Oceanography, American Society of Civil Engineers, Water Pollution Control Federation.
Summary of Experience	Responsible for development and application of a mathematical model of oxygen depletion in the New York Bight as related to waste inputs and biological, chemical and physical interactions. Developed steady-state water quality model of major polluted Midwest river for assessment of implementation of U.S. E.P.A. industrial effluent limitations. As Chairman and representative from U.S. E.P.A., coordinated and prepared Water Supply Appendix for the Great Lakes Basin Commission Framework Study. As commissioned officer in U.S.P.H.S., was responsible for interagency coordination of water resource and water supply activities for Region 5, U.S. E.P.A.
Selected Publications	<p>A. Stoddard, J. Walsh, A. Tingle, D. Dieterle and G. Han, Oxygen Depletion within the New York Bight: An Ecosystems Model of Waste Inputs, Phytoplankton Species Succession; and Climatology, <u>52nd Annual Conference of the Water Pollution Control Federation, Houston, TX, 1979.</u></p> <p>A. Stoddard and D. Crevensten, Water Quality Model of the Lower Fox River, Wisconsin, <u>Proceedings of the 17th Conf. Great Lakes Res., 501-513, Int. Assoc. Great Lakes Res., 1974.</u></p> <p>A. Stoddard, editor, Appendix 6: Water Supply-Municipal, Industrial Rural, Great Lakes Basin Framework Study, Great Lakes Basin Commission, Ann Arbor, Michigan (1975).</p>

ARTHUR G. TINGLE	Meteorologist
Education	Georgetown College (B.S. in Physics); Ohio University (M.S. in Mathematics, 1963); University of Michigan (M.S. in Meteorology, 1966; Ph.D. in Meteorology).
Research Interests	Development, application and validation of numerical models of the atmosphere and ocean for local and regional scales.
Professional Affiliations	The Society of the Sigma Xi; Pilots International Association.
Summary of Experience	Responsible for the development and assessment of dynamic modeling of transport and diffusion of atmospheric pollutants on the mesascale with particular application to flows over complex topography. Models used for wide range of emission sources including rocket launching and power plants. Experienced in the study of coastal meteorology and the design of sea breeze models and particle-in-cell transport diffusion models. Application of both dynamic and diagnostic models of shallow coastal seas for the study of the physical transport of pollutants, their modifications by the coastal food web, and transfer to man. Models used regularly for oil spill trajectories.
Selected Publications	<p>A. G. Tingle, D. A. Dieterle and J. J. Walsh, Perturbation analysis of the New York Bight, in: <u>Ecological Processes in Coastal and Marine Systems</u>, R.J. Livingston, Editor, Plenum Publishing Co., 1979.</p> <p>J. J. Walsh, C. D. Wirick, A. G. Tingle, and D. A. Dieterle, Environmental Constraints on Larval Fish Survival in the Sea. <u>Proc. ICES Symp on Early Life History of Fish ICES/ELH Symp./M:F</u>, Woods Hole, MA, 1979.</p> <p>A. Stoddard, J. J. Walsh, A. G. Tingle, D. A. Dieterle and G. Han, Oxygen Depletion within the New York Bight; an Ecosystems Model of Waste Inputs, Phytoplankton Species Succession; and Climatology. <u>52nd Annual Conference of the Water Pollution Control Federation</u>, Houston, TX, 1979.</p>

JULIO VIDAL	Oceanographer
Education	University of Concepcion, Chile (Degree in Biology, 1966); University of Southern California; University of Washington (Ph.D. in Oceanography, 1978.)
Research Interests	Trophic and energetic relations in lower trophic levels of pelagic communities; biochemistry of trophic process in planktonic herbivores; distributional patterns of zooplankton in relation to environmental factors.
Professional Affiliations	American Society of Limnology and Oceanography; American Society for the Advancement of Science.
Summary of Experience	Extensive sea-going experience and participation in planning and execution of field oceanographic research; laboratory studies on the effects of environmental factors on rates of physiological processes in zooplankton, including rates of feeding, growth, development, and metabolism. Co-principal Investigator of two projects on rates of physiological processes and distribution of zooplankton in the Bering Sea.
Selected Publications	<p>J. Vidal, Physioecology of Zooplankton. I. Effects of Phytoplankton Concentration, Temperature, Body Size, and their Interactions on the Weight-Specific Growth Rate of <u>Calanus pacificus</u> and <u>Pseudocalanus</u> sp. <u>Mar. Biol.</u> 56, 111-134 (1980).</p> <p>J. Vidal, Physioecology of Zooplankton. II. Effects of Phytoplankton Concentration, Temperature, Body Size, and their Interactions on the Weight-Specific Growth Rate of <u>Calanus pacificus</u> and <u>Pseudocalanus</u> sp. <u>Mar. Biol.</u> 56, 135-146 (1980).</p>

KARL VON BOCK

Oceanographer Associate

Education

Boise Junior College (A.A. in Liberal Studies, 1961); University of San Francisco, University of Utah (B.A. in English Literature, 1965); University of Denver, University of Washington, University of Oregon (J.D., 1972).

Research Interests

Personal interest in the Law of the Sea, data base management.

Summary of Experience

Formerly senior resident marine technician, University of Washington - was responsible to various principal investigators for adaptation of research vessel to investigator requirements for relevant data acquisition methods and analyses, and for supervision of junior personnel. Currently, inter alia editor oceanographic sciences data reports also responsible for: Planning, oversight of cruise logistics, collecting, reducing and analyzing variously specified cruise data; providing assistance to division head in carrying out various ad-hoc administrative and/or management demands (conferences, task/purpose documentation, associated research, etc.); shared responsibility for the loading and management of a resident data base.

Selected Publications

K. Von Bock, Editor, Atlantic Coastal Experiment-III R/V George B. Kelez Cruise Data Report 1979, BNL 27401, February 1980.

E. Wold and K. Von Bock, Editors, Atlantic Coastal Experiment-II R/V Eastward Cruise 1980 Data Report, BNL 27402, January 1980.

K. Von Bock, Editor, Atlantic Coastal Experiment-II R/V Researcher Cruise Data Report 1979, BNL 26774, September 1979.

CREIGHTON D. WIRICK Jr. Research Associate

Education University of Utah (B.S. in Biology 1970; M.S. in Biology, 1972); University of Washington (Ph.D. Candidate in Oceanography, 1975).

Research Interests Biological oceanography; biomathematics.

Professional American Society of Limnology and Oceanography.
Affiliation

Summary of Experienced marine technician. Expertise in data acquisition and reduction, including graphics and time series
Experience analysis.

Selected J. J. Walsh, T. E. Whittledge, T. W. Barvenik,
Publications C. D. Wirick, S. O. Howe, W. E. Esaias, and J. T. Scott,
Wind Events and Food Chain Dynamics within the New York
Bight. Limnology & Oceanography 23, 659 (1978).

TERRY E. WHITLEDGE Oceanographer

Education Western Illinois University (B.S. in Chemistry, 1964; M.S. in Chemistry, 1966); University of Washington (Ph.D. in Oceanography, 1972); Postdoctoral Research Associate, University of Washington 1972-75.

Research Interests Biological and chemical processes related to the distribution of organisms in the ocean; moored arrays for measuring biological variables in the ocean; automated chemistry of seawater nutrients; stimulation of primary productivity by municipal sewage effluent; computer simulation of ecosystem dynamics.

Professional Affiliations Sigma Xi; American Society of Limnology and Oceanography; American Association for the Advancement of Science.

Committees Chairman, IRIS Advisory Committee, Coastal Upwelling Ecosystems Analysis (CUEA).

Summary of Experience Principal Investigator; Nutrient Excretion and Regeneration, Coastal Upwelling Ecosystems Analysis program of IDOE/NSF, October 1977 - April 1980. Senior personnel; Puget Sound Interim Studies: Interrelationships among chemical, physical and biological parameters in the Puget Sound Main Basin, Municipality of Metropolitan Seattle, October 1974 - April 1976; Principal Investigator, Nutrient Dynamics and Distribution in the Bering Sea, Processes and Resources of the Bering Sea Shelf program of OPP/NSF, July 1976 - December 1982. As a result of these studies and the BNL oceanographic program, extensive investigations were conducted in the Mediterranean-Black Sea, Northwest Africa, Peru, Eastern tropical Pacific, Bering Sea and Northeastern U.S. Continental Shelves. The impact of municipal wastes was also examined extensively in the Southern California Bight, Saronikos Gulf off Athens, Greece, and the New York Bight including the Hudson River-Rariton Bay Estuary.

Selected Publications T. E. Whitledge, Regeneration of Nitrogen by Zooplankton and Fish in the Northwest Africa and Peru Upwelling Ecosystems, in: Upwelling Ecosystems, R. Boje and M. Tomczak, Editors, Springer-Verlag, pp. 90-100, 1978.

T. E. Whitledge, R. L. Iverson and J. J. Coering, Chlorophyll and Nitrate Fine Structure in the Southeastern Bering Sea Shelf Break Front, Nature 281, 664-66 (1979).

T. E. Whitledge and H. L. Conway, Distribution, Fluxes and Biological Utilization of Inorganic Nitrogen During a Spring Bloom in the New York Bight, J. Mar. Res. 37, 657-68 (1979).