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THE BULLETIN

Mount Desert Island Biological Laboratory

Salsbury Cove, Maine

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The Mount Desert Island
Biological Laboratory
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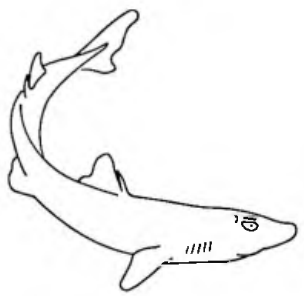
1978



Volume 18 **Issued 1979**

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WILLIAM BOARDMAN KINTER
1926-1978

Dr. William B. Kinter, a member of the Mount Desert Island Biological Laboratory since 1963 and a year-round investigator there since 1972, died suddenly at his home in Salsbury Cove on October 5, 1978.

He was born in Philadelphia on March 25, 1926, son of William L. and Marjorie B. Kinter. He graduated from Phillips Exeter Academy in 1944. In 1947 he married Anne E. Wilson and to this marriage were born three children Lewis B. (1950), William L. (1951) and Marion A. (1955). Bill served as an ambulance driver for the American Field Service with the 4th British Army towards the end of the second world war. He told us about it as we sat by a fire of driftwood one evening on Old Man Island when the fog was too thick for us to be picked up until the following morning. He described the crossing of the Irrawaddy to form a second bridgehead that overflanked the Japanese army and forced them out of Mandalay. It all seemed very remote in the peace of that tiny island where the only reminder of modern civilization was the occasional drone of a jet plane on its way to Europe. The fact that we had a comfortable night was due to Bill's foresight. That was typical of his approach to his work; he had cached on the island, food, water, blankets, a tent and a shortwave radio.

After the war he entered Swarthmore and obtained a B.A. degree in zoology. In 1949 he went to Harvard where he was to spend the next twelve years, first as a medical student, and then as a graduate student under John R. Pappenheimer, obtaining his Ph.D. in 1955. This work was published in a series of papers in the American Journal of Physiology, thus beginning an association with that journal that was to last through his career. After obtaining his Ph.D. he remained in the Department of Physiology for another seven years, successively as instructor, associate, and assistant professor. In 1962 he accepted an appointment as Professor of Physiology at the Upstate Medical Center of the State University of New York at Syracuse. His research there was directed toward improving techniques for the study of membrane transport. His association with the Mount Desert Island Biological Laboratory started in 1963 and 1972 he made the decision to move there as a year-round investigator. When the definitive history of MDIBL comes to be written, perhaps for our centenary in 1998, I venture to suggest that Bill Kinter will hold an honored place. His scientific achievements will, of course, entitle him to mention, but I think that his role as one of the two pioneers in setting up the year-round operation will be judged to have been of critical value to the laboratory. In 1970 Bill started

to use his expertise in transport physiology to solve environmental problems, and from this point onward an ever increasing amount of his time was concerned with the physiological effects caused by pollutants. It was a fruitful partnership for all concerned. It got Bill into field work for which he had a natural inclination and some of his happiest days were spent on the seabird islands off the Maine coast. He reveled in adverse conditions in the field. I remember last summer, he and Vic Murdaugh were trying to light their pipes in a driving rain on Little Duck Island, while we were taking blood samples from young Black Guillemots, and on another occasion when he exulted in being able to pilot "Dickie Bird" safely back to port in dense fog.

Bill was active in the administrative side of science. He was on the editorial board of the American Journal of Physiology from 1969 to 1973, being editor of the Renal and Electrolyte Physiology Section. He was a member of the Physiology Study Section of NIH from 1965 to 1969 and was chairman of the section from 1966 to 1969. He was serving on the site committee for the environmental core grant program of the biomedical section, NIH, at the time of his death. He was a trustee of MDIBL from 1966 to 1971 and a member of the executive committee from 1967 to 1970 and again in 1978.

The flag at the post office at Salsbury Cove was lowered to half-mast when Skippy heard the news. The crowded church at Hulls Cove was a tribute to the esteem, respect and affection in which Bill was held both by the local community and by the world of science.

- David S. Miller

DESCRIPTION OF FACILITIES

The Mount Desert Island Biological Laboratory is an independent marine biological station on the coast of Maine near the mouth of the Bay of Fundy which provides a research facility for investigations on local flora and fauna. There is laboratory space for 34 research programs. Certain specialized equipment is available. During 1978 there were 129 scientific personnel in 33 research groups representing 53 institutions in 17 states and abroad. The personnel included 46 investigators and co-investigators of faculty rank. The work of the laboratory covers a broad area of biology, comparative physiology and biochemistry. Advanced undergraduate, graduate, medical and post doctoral students spend the summer under supervision of senior investigators.

No formal courses are given but weekly formal and informal seminars are scheduled. Effective 1971 some year-round programs were established.

The laboratory administration solicits and welcomes applications from all qualified scientists whose programs can be best fostered in its environment. With rare exceptiors, investigators are required to utilize local flora and fauna. The opportunity to work at MDIBL is advertized annually in the journal *Science*. Recently, the number of applications has exceeded the capacity of the laboratory. Applications are screened for scientific merit by a Scientific Advisory Committee, made up of investigators who have worked at the laboratory for some time, and then by the Executive Committee, for feasibility and setting of priorities of acceptance. New investigators routinely constitute 30% to 40% of the summer population. Acceptance notices are usually issued in late March or early April for tenancy in June.

History and Organization

The Laboratory was founded in 1898 by J. S. Kingsley of Tufts College, and its original location was at South Harpswell, Maine. The site at Salsbury Cove was donated to the Laboratory by the Wild Gardens of Acadia, a group instrumental in the establishment of Acadia National Park, and removal to this location was completed in 1921. The first laboratory buildings, the original salt water system, and some of the residential cottages were constructed or obtained by the gifts of local summer residents.

The Mount Desert Island Biological Laboratory was incorporated in 1914 under the laws of the State of Maine as a nonprofit scientific and educational institution, and it is owned and operated by the Trustees and members of the Corporation. At present there are 360 members of the Corporation. It functions with minimal full-time professional administrative personnel and in most ways it is a cooperative enterprise. Income is derived from membership dues, laboratory fees, cottage rentals, investments, private and corporate donations, and grants. The business and scientific management of the Laboratory is in the hands of the Director and the Board of Trustees.

The Directors have been: Ulrich Dahlgren, Princeton University (1920-26); H. V. Neal, Tufts College (1926-31); William H. Cole, Rutgers University (1931-40); Roy P. Forster, Dartmouth College (1940-47); J. Wendell Burger, Trinity College (1947-50); Warner F. Sheldon, University of Pennsylvania (1950-56); Raymond Rappaport, Jr., Union College (1956-59); Alvin F. Rieck, Marquette University (1959-64); William L. Doyle, University of Chicago (1964-67); Charles E. Wilde, Jr., University of Pennsylvania (1967-70); H. V. Murdaugh, Jr., University of Pittsburgh (1970-75); Richard M. Hays, Albert Einstein College of Medicine (1976-).

Location

Mount Desert Island lies in the Gulf of Maine about 120 miles northeast of Portland, Maine, and is connected to the mainland by a short bridge. Year-round air service is available to Bangor, Maine with

connecting flights on Bar Harbor Airlines, as well as direct flights from Boston to Bar Harbor Airport. The island has an area of more than 100 square miles and is traversed east to west by a range of glaciated mountains and north to south by a narrow fjord six miles long that partially divides the east and west halves. Among the mountains lie several deep fresh water lakes and shallow ponds. Much of the mountainous area is a part of Acadia National Park. The island is separated from the mainland and adjacent island by narrow deep bays. Spring tides average 13.2 feet and neap tides 8.7 feet.

The many varied biological resources of the Acadian area are readily available. In summer, the cold waters of the Gulf of Maine are rich in marine life. The rocky shores, and flats and strong tidal currents provide a variety of habitats. Fresh water lakes and ponds and the mixed terrain give further diversity to the forms available. Certain of these are abundant, others are scarce. The research abstracts in past Bulletins will give a good indication of the common forms. The director will be glad to furnish an estimate of the availability of any special forms. Special arrangements may be made for collections in Acadia National Park.

Physical Plant

The Laboratory is situated on a tract of about 150 acres fronting on Frenchman Bay at Salsbury Cove in the Township of Bar Harbor. In addition to shore frontage, the Laboratory owns part of a fresh water pond and brook, and its land varies from meadow and forest to sphagnum bog. Investigation is carried on in single story buildings of frame construction located along the shore. These buildings are as follows:

(1) *Neal Laboratory.* This, the oldest and largest of the laboratory buildings, was remodeled in 1955 and now contains eight laboratories: four large rooms that will each accommodate 3 to 4 persons, and four small rooms suitable for single investigators. All rooms are provided with gas, and fresh and salt water. Water troughs, aquaria, and larger tanks are located along the north wall outside.

(2) *Halsey Laboratory* was remodeled in 1961 and consists of four rooms, each capable of accommodating 3 to 4 persons. The rooms all have gas, fresh and salt water. Refrigerators, ovens and aquaria are located on a common terrace at the entrance to the building.

(3) *Marshall Laboratory,* a new year-round facility containing five laboratories and a common instrument room, and a full basement.

(4) *The Kidney Shed* is a single large laboratory. It accommodates two research groups.

(5) *Hegner Laboratory* contains 9 laboratory rooms provided with salt and fresh water each accommodating 1 to 3 persons.

(6) *Karnofsky Laboratory,* constructed in 1970, contains 4 large laboratories, one large enough to accommodate 2 research groups. This lab has been winterized and is a year-round facility.

(7) *Union Station* erected in 1962 contains two laboratories, each suitable for 2 to 3 persons and is equipped with salt and fresh water.

(8) *The Instrument Room* was renovated in 1955 for the purpose of housing equipment used in common by members of the Laboratory. In 1969 one-half of this space was equipped as a research laboratory.

(9) *Biophysics Building.* This air-conditioned building was erected in 1965. It houses isotope counting systems, ultracentrifuges, spectrophotometers, and sectioning equipment for electron microscopy.

(10) *Directors Office.* A separate building contains the directors office and a small conference room.

(11) *Business Office and Library.* In the same building as the shop and balance room.

(12) *Dahlgren Hall,* the former village schoolhouse, was purchased and converted to use as a meeting hall; it houses a reprint collection. The single large room can seat about 120 persons. It is equipped with projectors.

(13) *The Dining Hall.* This dining hall and living room for about 20 junior investigators and students was built in 1963. It is operated by a cook-manager. A small general library of books and records and a record player have been furnished by private donation.

(14) *Bowen Hall* is one of the oldest remaining examples of early 19th century Island architecture. It now serves as one of four dormitories and has a common room for young women.

Support Facilities

(1) *Dock.* The dock consists of two floats with livewells and attached live cars for storage of specimens. It is attached to the shore by an inclined ramp and a bridge and abutment.

(2) *Collecting Boats.* A 32' gasoline powered collecting boat, the *Squalus*, was built in 1958. It is provided with a circulating water tank for the transportation of specimens. Arrangements can be made with local fishermen for offshore specimens. A Novia Scotia skiff with an outboard motor is also used for collecting and skiffs are available to investigators. A motor launch is used for access to bird breeding colonies.

(3) Pick-up trucks are used for laboratory operations and specimen transport.

Housing

Sixteen cottages suitable for families with children stand on land owned by the Laboratory and are within easy walking distance of it. The cottages are rented by the season, or occasionally for shorter periods. Occupants must supply their own blankets and linen, as well as pay the Laboratory for the use of the cottage (which includes utilities and garbage disposal). Rent is $990 to $1210 per season, depending upon the size of the cottage. A few privately owned cottages are also available for rental near the Laboratory, and in other communities on the Island. An automobile is essential for family mobility in the area.

Single investigators, student assistants, and couples without children rent rooms in the village or in laboratory dormitories and take their meals in the Laboratory Dining Hall. The weekly charge for meals is based on self-sustaining nonprofit operation.

In order to encourage private construction and ownership of cottages by workers, the Laboratory has a policy of issuing leases on certain plots of laboratory land. Provision is made for sale or rental of the cottages to other workers in case their owner finds it impossible to continue to work at the Laboratory. In this way, the Laboratory is able to encourage capital investment by individuals and at the same time ensure that the land will remain under its own jurisdiction. At present seven cottages are privately owned in this way.

Four dormitories (two for men and two for women) are available for summer laboratory assistants. They are relatively old wooden buildings.

Recreational Activities

Mount Desert Island has long been known to have one of America's most desirable summer climates. The ocean, rocky shores, and mountains provide scenery of unexcelled beauty. The distance from large metropolitan areas has so far helped to keep it relatively unspoiled. Swimming, hiking, mountain climbing, picnicking, boating and sailing, tennis, golf, and other sports are readily available. Acadia National Park with its excellent naturalists' program contributes to the general interest. There are small museums of Indian and local lore, public gardens, a good public library and cultural exhibits. Proximity to the Jackson Laboratory adds scientific interest and resources. Salsbury Cove is an old fishing and farming community on the northern shore of the Island near the main road from Bar Harbor to Ellsworth. It has one general store and Post Office. The Laboratory colony comprises about 180 adults and 80 children of assorted ages, and forms a considerable portion of the summer population of the village. Bar Harbor, the largest town on Mount Desert Island, is about six miles from the Laboratory and provides many of the services of a city including excellent shopping facilities and a good hospital.

Acknowledgments

The Mount Desert Island Biological Laboratory is indebted to the National Science Foundation for substantial support during the past. Funds for renovations of buildings and new construction have permitted the Laboratory to expand and upgrade its facilities. Contributions to operating costs and for specialized research equipment have greatly improved the efficiency of research activities. The individual research projects which have been served by this Laboratory are variously funded by private and government agencies and by individuals and all of these projects have benefited from the National Science Foundation grants to the Laboratory. Current support under grant PCM-77-26790 is gratefully acknowledged. Additional support has been provided by NIH Biomedical Research Support Grant S07 RR 05764.

Applications

Fees for research space vary according to the demand made on the facilities. They range from $320 to $1235 depending on the space assigned and the number of workers. Special arrangements may be made for facilities beyond the summer season (June 15 - September 15). All investigators have the use of the general facilities, but special arrangements are necessary if unusual demands are anticipated. Investigators are urged to bring their own specialized equipment and chemicals. On occasion, the Laboratory may be able to provide apparatus which would have long-term usefulness for other workers. Isotope counting systems and ultracentrifuges are available on a fee basis. Persons planning to use isotopes must make prior arrangements in conformity with our Radiation Safety Committee requirements.

In an effort to make our specimen collecting facilities as self-supporting as possible, fees change almost annually. This year's fees ranged from $3 for dogfish, skates, and flounder, to $50 per trip for unusual specimens. Some of the commonly used organisms include:

Pisces: *Myxine glutinosa*, hagfish; *Squalus acanthias*, spiny dogfish; *Raja erinacea*, little skate; *Anguilla rostrata*, eel; *Fundulus heteroclitus*, killifish; *Lophius americanus*, goosefish; *Myxocephalus sp*, sculpins; *Pholis gunnellus*, rock eel; *Pseudopleuronectes americanus*, winter flounder.

Invertebrates: Echinarachnius *parma*, sand dollar; *Pagurus sp*, hermit crabs; *Homarus americanus*, lobster; *Boltenia ovifera*, sea potato.

Other native fauna under investigation include:

echinoderms, gastropods, frogs and salamanders, and marine birds.

Limited fellowships are supported by funds from the Ulrich Dahlgren Memorial fund (a gift from the American Philosophical Society) and other memorial funds.

Application and inquiries should be addressed to the Laboratory Director:

July 1 - August 31
Dr. Richard M. Hays
Mount Desert Island Biological Laboratory
Salsbury Cove, ME 04672

September 1 - June 30
Dr. Richard M. Hays
Albert Einstein College of Medicine
1300 Morris Park Avenue
Bronx, NY 10461

Inquiries regarding specific matters such as laboratory charges and facilities can also be directed to:

Mr. Jonathan S. Gormley
Business Manager
Mount Desert Island Biological Laboratory
Salsbury Cove, ME 04672

THE MOUNT DESERT ISLAND BIOLOGICAL LABORATORY

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THE MOUNT DESERT ISLAND BIOLOGICAL LABORATORY

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NAME	INSTITUTION
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Thomas H. Maren	University of Florida
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Jussi Melartin	Wesleyan University
Martin Morad	University of Pennsylvania
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Richard Naftalin	King's College, London
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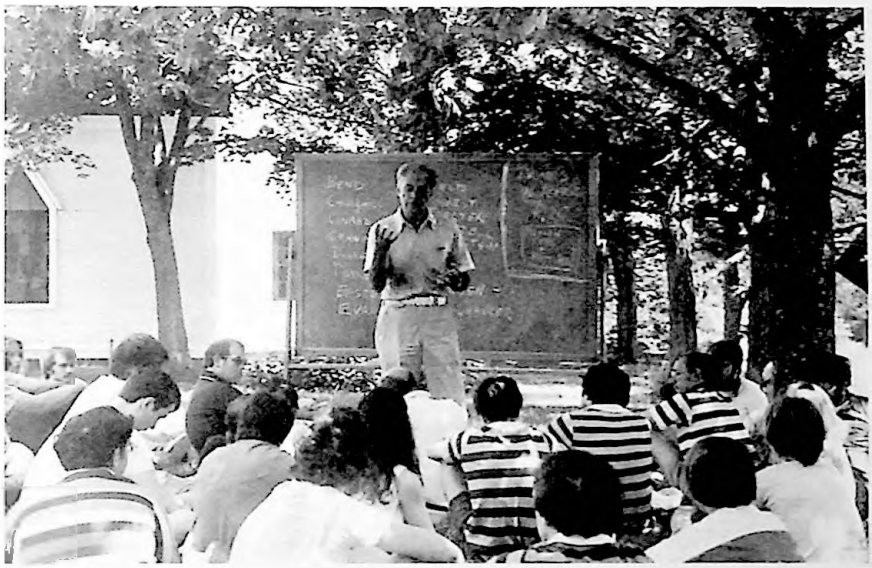

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RESEARCH PROGRAMS - 1978

Bend, John R., Ph.D., Head, Marine Pharmacology and Biomedicine, NIEHS

1. Epoxide metabolism and excretion in winter flounder
2. Pharmacokinetics of single, radiolabeled constituents of crude oil in marine species
3. Reconstitution of the microsomal mixed-function oxidase system from selected marine species
4. Screening of teleost (flounder, fundulus) and elasmobranch (dogfish, skate) species for induced hepatic mixed function oxidase (MFO) activities in the field

Boyer, James L., M.D., Professor of Medicine, University of Chicago

1. Histochemical localization of sodium potassium ATPase in liver of the small skate
2. Quantitation and characterization of lipids in livers of the small skate.

Churchill, Paul C., Ph.D., Associate Professor of Physiology, Wayne State University
Micropuncture studies of isolated flounder tubules

Conrad, Gary W., Ph.D., Associate Professor of Biology, Kansas State University
Control of polar lobe formation in the eggs of *Ilyanassa obsoleta*

Crawford, Richard B., Ph.D., Professor of Biology, Trinity College
Effects of pesticides and petroleum extracts on embryo development

DeVries, Arthur L., Ph.D., Assistant Professor of Physiology, University of Illinois
Filtration and reabsorption of peptide antifreezes in the kidneys of cold-water fishes

Doyle, William L., Ph.D., Professor Emeritus of Anatomy, University of Chicago
Fine structure and saline secretion

Edelhauser, Henry F., Ph.D., Professor of Physiology and Ophthalmology, Medical College of Wisconsin
Comparative corneal ultrastructure and glucose metabolism in marine teleosts and elasmobranchs

Epstein, Franklin H., M.D., Professor Medicine, Head, Department of Medicine, Harvard Medical School and Beth Israel Hospital

1. Prolactin in freshwater adaptation by *Anguilla rostrata*
2. Role of vasoactive intestinal peptide and Na-K-ATPase in regulation of rectal gland secretion

Erlij, David, M.D., Ph.D., Assistant Professor of Physiology, SUNY Downstate Medical Center
Effects of toxicity on amino acid fluxes in elasmobranch skeletal muscle

Evans, David H., Ph.D., Professor and Chairman, Department of Biology, University of Miami

1. NH_4 and H excretion by the little skate, *Raja erinacea*
2. The effects of ionic substitutions on the transepithelial potentials across *Raja erinacea*, *Squalus acanthias* and the *in vitro* uterine wall and yolk sac of *Squalus acanthias*
3. Na and Cl fluxes across *Squalus acanthias* "pups": the effect of ionic substitutions and the transepithelial potential

Eylers, John P., Ph.D., Lecturer, University of North Carolina

Stress distribution and ossicle morphology in the starfish skeleton

Field, Michael, M.D., Professor of Medicine and Physiology, University of Chicago

Ion transport mechanisms in flounder intestine and dogfish rectal gland

Forrest, John N., Jr., M.D., Associate Professor of Medicine, Yale University School of Medicine

1. Interaction of calcium and cyclic nucleotides in dogfish rectal gland
2. Cell volume regulation in the dogfish rectal gland (with Dr. A. Kleinzeller)
3. Rectal gland function *in vivo* during adaptation to dilute seawater (with Dr. Murdaugh)

Forster, Roy P., Ph.D., Research Professor in Biology, Dartmouth College

1. Taurine transport in skate "hemi-atrium" preparation
2. Biphasic effects of sulfhydryl reagents and phloridzin on organic anion transport by flounder isolated renal tubules

Frizzell, Raymond A., Ph.D., Associate Professor of Physiology, University of Pittsburgh

Studies on NaCl transport by *Pseudopleuronectes americanus* intestine

Goldstein, Leon, Ph.D., Professor of Biomedical Sciences, Brown University

Nitrogen metabolism in elasmobranch fishes

Gomez, Daniel G., Ph.D., Assistant Professor of Anatomy; Associate Research Professor of Radiology, Cornell University Medical College

Pathways of cerebrospinal fluid absorption in the dogfish

Hays, Richard M., M.D., Professor of Medicine, Albert Einstein College of Medicine

Studies of cyclic AMP-stimulated kinase in the dogfish rectal gland

Helman, Sandy L., Ph.D., Associate Professor of Physiology and Biophysics, University of Illinois

Electrophysiology of epithelia

Hogben, C. Adrian, M.D., Ph.D., Professor of Physiology and Biophysics, University of Iowa

Epithelial transients: via step current vs. step voltage

Kent, Barbara, Ph.D., Associate Professor of Physiology; Director, Surgical Research Laboratory, Mt. Sinai School of Medicine, Bronx V.A. Hospital

Studies of physiologic and pharmacologic control of relative functional surface area in dogfish gill

Kidder, George W., III, Ph.D., Associate Professor of Physiology, University of Maryland School of Dentistry
1. Energetics of gastric acid secretion in dogfish
2. Acid secretion in goosefish gastric mucosa

Kinter, William B., Ph.D., Resident Scientist, MDIBL
1. Physiology and morphology of cell transport
2. Membrane toxicity theory and environmental pollutants

Kleinzeller, Arnost, Ph.D., Professor of Physiology, University of Pennsylvania School of Medicine
1. Sugar transport in the flounder kidney (jointly with John B. Pritchard)
2. The mechanism of the active transport of 2-deoxy-D-galactose (jointly with R. Naftalin)
3. Pilot project: Cell volume control in the rectal gland of the dogfish (jointly with John Forrest)

Malvin, Richard L., Ph.D., Professor of Physiology, University of Michigan
Physiological role of angiotensin in fish

Maren, Thomas H., M.D., Professor and Chairman, Department of Pharmacology and Therapeutics, University of Florida School of Medicine
1. Comparative physiology of Bohr effect
2. Electrolyte and CO_2 metabolism of the lens
3. Characterization of carbonic anhydrase in fish including Myxine

Miller, David S., Ph.D., Resident Scientist, MDIBL
Environmental pollutants and membrane transport

Morad, Martin, Ph.D., Professor of Physiology, University of Pennsylvania
Electromechanical studies in the heart of sea potato

Murdaugh, H. Victor, Ph.D., Professor and Chairman, Department of Medicine, University of South Carolina School of Medicine
Endocrine response of the dogfish to a dilute environment

Opdyke, David F., Ph.D., Professor of Physiology, CMDNJ-New Jersey Medical School
Studies on the physiology of the renin-angiotensin system using the dogfish, a primitive vertebrate, as a model

Peakall, David B., Ph.D., Chief, Toxic Chemical Division, Canadian Wildlife Service
Effects of oil on intestinal transport and nutrition of seabirds

Pritchard, John B., Ph.D., Research Physiologist, NIEHS
1. Role of intracellular binding in organic acid excretion
2. Ouabain binding, cell morphology and Na, K-ATPase in the gills of shore crabs during adaptation to a dilute environment
3. The effects of xenobiotics on Ca++ fluxes in mollusc mantle
4. Cellular localization and characteristics of 2-deoxy-D-galactose transport *in vitro*

Schmidt-Nielsen, Bodil, Ph.D., Resident Scientist, MDIBL

1. Osmoregulation of marine invertebrates
2. Structure and function of the mammalian renal pelvis
3. The urea conservation mechanism in the skate kidney

Schultz, Stanley G., M.D., Professor of Physiology, University of Pittsburgh School of Medicine
Electrophysiology of chloride-secreting epithelia

Silva, Patricio, M.D., Assistant Professor of Medicine; Associate Director of Renal Unit, Harvard Medical School, Beth Israel Hospital
Relation between metabolism and function in the isolated perfused rectal gland

Stoff, Jeffrey S., M.D., Assistant Professor of Medicine, Beth Israel Hospital

1. Factors which regulate vasoactive intestinal peptide (VIP) synthesis and release in the dogfish
2. Effect of VIP in aglomerular goosefish
3. Studies on adenylate cyclase activity of rectal gland membranes
4. Autoradiographic studies of ^{125}I-VIP in rectal gland slices

Wilde, Charles E., Jr., Ph.D., Professor and Chairman, Department of Zoology, University of Rhode Island
The ontogeny of the euryhaline state in *Fundulus* species

Zadunaisky, Jose A., M.D., Professor of Physiology and Biophysics, New York University Medical School
Transport phenomena in ocular and other tissues of marine animals

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David M. Hays pp. iv, xiii, xix

1978 Formal Evening Seminars - Dahlgren Hall

WEDNESDAY, July 5	Dr. Samuel Gruber, University of Miami "Shark sight: Its visual adaptation and capabilities"
TUESDAY, July 11	Dr. David Evans, Department of Biology, University of Miami "Na/NH and Na/H exchange in marine teleosts: Why aren't all fish euryhaline?"
TUESDAY, July 18	Dr. Kenneth Spring, National Institutes of Health "Ion activities in proximal renal tubules"
TUESDAY, July 25	Dr. Sandy Helman, University of Illinois, Urbana "Transport characteristics of the rabbit cortical collecting tubule: Electrophysiology of DOCA"
TUESDAY, August 8	Dr. Claude P. Lechene, Harvard University "Electron Probes: Their applications in biology and medicine"
TUESDAY, August 15	Dr. Gustav Dallner, Arrhenius Laboratory, Department of Biochemistry, University of Stockholm, Sweden (The William Doyle Lecture) "Structural organization of the endoplasmic membrane system"
TUESDAY, August 22	Dr. Gerhard Giebish, Department of Physiology, Yale University School of Medicine "New aspects of potassium transport in the kidney tubule"
TUESDAY, August 29	Dr. Adrian Hogben, University of Iowa and MDIBL "The transient nature of equivalent circuits in the sea, on land. On the meaning of epithelial conductance"

1978 Informal Seminars

Lunch Hour Seminars

July 6 and 13	Summaries of summer research projects
July 20	A. DeVries - Renal handling of Peptide and Glycopeptide Antifreezes in "Cold water" Fishes
July 27	R. Naftalin - Intestinal Secretion
August 3	L. Goldstein - Alanine Biosynthesis in Starving Dogfish
August 11	R. Frizzell - NaCl Transport by Flounder Intestine
August 27	J. Bend - Xenobiotic Biotransformations

Special Seminars

July 21	P. Strauss - Nucleoside Transport in Normal and Leukemia Lymphocytes
August 17	O. Rosen, Visiting Scientist - Regulation of Cyclic AMP-Dependent Protein Kinases

Epithelial Transport Colloquia* - 8:00 AM

July 7	S. Schultz - Applications of electrical circuit models to the study of sodium transport epithelia
July 14	S. Helman - Electrophysiology of frogskin
July 17	S. Helman - continuation
July 24	R. Frizzell - Potassium transport across the basolateral membranes of rabbit colon
July 31	K. Beyenbach - Electrophysiology of Na transport in the distal nephron of the garter snake
August 7	M. Duffey - Sodium-coupled chloride transport by rabbit gallbladder: Measurements of intracellular chloride activities
August 14	R. Hays - Water transport through epithelia
August 23	Q. Al-Awqati - The nature of the proton pump in the turtle bladder
August 28	A. Kleinzeller - Volume regulation in cells

*Sponsored by the Congregation of Concerned Epitheliologists