THE PHYSIOLOGIST

A Publication of the American Physiological Society Volume 33, Number 3 June 1990

EDITORIAL

Dateline—Washington

A spokesperson for the Interior Department announced today the American Scientist was being placed on the endangered species list. Under the Endangered Species Act, an animal is placed on the list when numbers drop below a level critical for the continued vitality of the species. The spokesperson said the decision was forced by the continuation of predatory behavior by university administrators against scientists and failure of the Federal government to preserve breeding sanctuaries.

Later that day, a press conference was held to discuss the Interior Department action. Participants included representatives from the Association of University Administrators (AUA), Save Our Scientists (SOS), and the Federal government.

The press release is false. The tone and message, however, are painfully clear. The American Scientist is faced with the continuing nightmare of budget restrictions, over regulation, and demands by universities for increased cost recovery. Coupled with reductions in support for trainees, the nation is faced with a potential severe shortage of scientists in the next century.

As budget constraints are applied to NIH, investigators are being forced to lower their expectations. What first seemed to be an interim measure, "the negotiated reduction," has now become a permanent fixture of the grants manager's armamentarium. Designed as a means to spread funds to more investigators, the current funding situation has resulted in its being coupled with even more drastic measures.

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Association of Chairmen of Departments of Physiology Annual Questionnaire Results

Lela Montgomery Aldrich, Steven J. Bailey, and Douglas G. Stuart
Department of Physiology,
University of Arizona, Tucson

Chairpersons of physiology departments were asked to complete a questionnaire regarding various aspects of departmental operation. This past year, 153 departments were mailed the survey, with 103 (67.3%) responding. The majority of the responses were from the United States, a few from Canada, and one from Puerto Rico. In future years, it would be helpful if a far higher percentage of responses could be obtained because there is universal agreement that this information is vital to the promulgation of physiology in North America.

Each questionnaire was examined for consistency of information and specific areas were selected for further analysis. Areas selected for verification and reconciliation were *1*) size of fulltime faculty; *2*) vacancies and their sources; *3*) salary information for fulltime faculty with regard to rank, degree, years in rank, sex, and annual salary; *4*) amount of funding available to support the programs of individual departments; *5*) percentage of faculty salaries from research grants; *6*) fringe benefit rate; and *7*) space. Careful examination of just these areas resulted in the need to clarify information on 63 questionnaires, 61.8% of the responses. By far, the greatest number of questions resulted from our failure to provide adequate instructions when we distributed the questionnaire. Fewer questions resulted from incomplete information on the questionnaire, and even fewer questions from failure to reconcile information between sections. A concern for confidentiality of salary data was the reason for incomplete information on four responses (no salaries available for 11 fulltime faculty; department head salaries not available for three other departments). We have dealt with the concern about confidentiality by physically removing the salary sections (without identifiers) from the rest of the questionnaire. Additionally, we have stripped all references to individual departments from the salary database in our computer. Finally, one department had an acting head paid through another department.

We have chosen to present information from most other areas in percentages of responses rather than in whole numbers because we were unable to reconcile these sections closely enough to feel comfortable with the results. We have indi-

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EDITORIAL

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Established investigators are now bearing the brunt of these measures. NINDS and NIGMS have applied 4% and 10% caps, respectively, on budget increases for funded renewals. As a result, some proposals are being funded at 30-40% below approved levels. Many scientists believe there is no longer reason to submit a budget for renewal because the institutes already have decided the amount each will receive.

Adding to the frustration experienced by the scientific community is the message from NIGMS that well-endowed scientists, those receiving more than $500,000, run the risk of not being funded, no matter how good their application. In NIGMS's effort to "preserve the diversity of scientific endeavors in very hard times," the institute may very well be sacrificing excellence in science.

Draconian measures necessitated by the current funding situation are troublesome only if you are fortunate enough to reach the payline. For those unable to reach the 12-14th percentile, all that remains is frustration. This frustration is compounded when a former NIH director states it is the percentage funded, not the percentile rank, that is important. For 1990, the award rate is projected to be 23% (26% in 1991), which represents support for all research programs. The difference between the percentile funded and the percentage funded is support for targeted programs.

The current funding situation has seen a decline in the number of traditional investigator-initiated awards and an increase in support for directed programs. Micromanagement of biomedical research by Congress is taking its toll.

Restrictive regulations promulgated by the Federal government have destroyed the traditional nurturing environment. These regulatons have had a severe impact on investigators' ability to do research and has created a top heavy bureaucracy that contributes to increasing indirect cost rates. The introduction of Parts 1 and 2 of the Animal Welfare Act, which regulates facilities using animals, has increased the paperwork and costs associated with animal research. Part 3 of the Animal Welfare Act, which deals with psychological well-being of primates and exercise for dogs, is expected to add $1 billion to the cost of research. Misconduct regulations have become effective this year, and NIH attempted to impose guidelines for conflict of interest. OSHA has proposed regulations on blood borne pathogens and hazardous chemicals, and EPA has issued a proposed rule to regulate radionuclides.

The additional regulations cost the investigator both time and money. Investigators now find themselves spending more time filling out forms than they spend in the laboratory. Universities must add deans and administrators to review these forms and build file rooms to store them.

The burden of regulation contributes to the continuing increase in overhead charges applied to grants. The government allows universities to recover the "full cost" of what it spends to support research. These include costs such as administrative support, building maintenance, libraries, utilities, building and equipment depreciation, etc.

The growing burden of indirect costs has resulted in increasing friction between the university and its faculty. While it is a problem at public institutions, its impact is most telling at pri-

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The Physiologist
Published bimonthly and distributed by
The American Physiological Society
9650 Rockville Pike
Bethesda, Maryland 20814
ISSN 0031-9376

Subscriptions: Distributed to members as part of their membership; nonmembers and institutions, $25.00 per year in the United States; elsewhere, $35.00. Single copies and back issues when available, $5.00 each; single copies and back issues of Fall Abstracts issue when available, $20.00. In 1990, subscribers to *The Physiologist* will receive it and the abstracts of the Fall Meeting of the American Physiological Society. The American Physiological Society assumes no responsibility for the statements and opinions advanced by contributors to *The Physiologist.*

Deadline for submission of material for publication: Dec. 5, February issue; Feb. 5, April issue; April 5, June issue; June 5, August issue; Aug. 5, October issue; Oct. 5, December issue. **If you change your address or telephone number, please notify the central office as soon as possible.**

Headquarters phone: (301) 530-7164. TELEFAX: (301) 571-1814.

5 States Enact Research Facility Protection Laws; Congress Moves Closer to Similar Law

Five states—Georgia, Idaho, Kansas, Kentucky, and Maryland—have enacted legislation that specifically protects research facilities within their states from break-in, theft, and vandalism.

This action brings the number of states to enact research facility protection laws to 10 since summer of 1988. The other states are Indiana, Louisiana, Massachusetts, Minnesota, and Utah. Similar legislation is being considered in Arizona and New York.

Meanwhile in Congress, the House Agricultural Subcommittee on Livestock, Dairy, and Poultry set June for a markup of H.R. 3270, the Farm Animal and Research Facility Protection Act, a bipartisan bill introduced by Rep. Charles Stenholm (D-TX), Edward Madigan (R-IL), and E. "Kiki" de la Garza (D-TX). The bill is a companion to a bill approved by the Senate in December.

All of the bills—state and federal—have been initiated by legislative bodies because of raids by animal activists on more than two dozen of the nation's research institutions, costing taxpayers millions of dollars to replace damaged facilities and equipment, stolen animals, and to restart research projects.

The Georgia law calls for maximum penalties of $10,000, 3 years in jail, or both for anyone convicted of damaging or destroying a facility or facility property or destroying animals. The law also permits the victim to collect actual, consequential, and punitive damages from the intruder, as well as court costs.

In Idaho the law states, "Any person who intentionally and without permission releases an animal, a bird, or an aquatic species which has been lawfully confined for agriculture, science, research, commerce, public propagation, protective custody, or education is guilty of a misdemeanor." Persons convicted are subject for damages and replacement costs, including the cost of repeating the experiment.

Both the Kansas and Kentucky laws are similar to the Georgia law, but with lesser penalties: fines up to $5,000, a jail term of not more than 1 year, or both. Anyone convicted under the Kentucky statute also may be ordered to pay restitution to the facility.

In Maryland, the law provides for a fine up to $5,000, a maximum prison term of 5 years, or both, if a person is convicted of breaking into a research facility with the intent to steal, alter, or eradicate or damage, deface, or destroy property regardless of the value.

In considering the legislation, the Maryland General Assembly asked the American Physiological Society to testify before its House Judiciary Committee in February.

Martin Frank, APS executive director, told the committee the law "would provide additional protection for the 260 (Maryland) physiologists and their colleagues in the biomedical sciences from vandalism and thefts by animal activists raiding Maryland facilities.

In the last 10 years animal activist groups—such as the Animal Liberation Front, True Friends, and Band of Mercy—have conducted 29 raids on research facilities of which seven raids were against institutions located in Maryland. Obviously, Maryland is a target state for those who seek to abolish all research requiring the use of live animal models."

William M. Samuels

Maryland Rejects Bill Restricting Animal Dissection in Classrooms

The Maryland General Assembly Senate Committee on Economics and Environmental Affairs killed a bill that would restrict animal dissection in the classroom following a public hearing on the proposal.

The bill would have required Maryland county school boards to notify parents should a student take a course that required dissection or other experiments with either live or dead animals or animal parts. Students could have been excused from the class if the parents provided a note to the teacher objecting on moral grounds.

Activist Pleads Nolo Contendere to Charge of Attempted Murder

An animal activist will serve one year in prison and three years probation after pleading no contest to an attempted murder charge.

Fran Stephanie Trutt entered a plea of nolo contendere in a Connecticut Superior Court to the charge that in 1988 she tried to murder Leon Hirsch, chairman of U.S. Surgical Corporation, by placing a remote control bomb near his company parking place in Norwalk, CT. She was given a 10-year sentence of which 9 were suspended.

U.S. Surgical Corporation has been the target of animal activists because it uses dogs in teaching operating room personal how to use surgical staples manufactured by the company.

The conviction is Trutt's second conviction, having pleaded guilty in federal court in New York last January for possession of explosives found in her Queens apartment. She received a 14-month prison sentence on that charge.

NIH to Provide Information on Animal Research Benefits

The National Institutes of Health (NIH) has established an office to provide information to researchers, legislators, educators, students, professional societies, and the public about the benefits of animal research.

The Office of Animal Research is in the Office of the Deputy Director and is managed by Louis Sibal, who is Senior Scientific Advisor to the NIH Deputy Director.

According to Sibal, the charge to the office is to "explain to the world that we need to continue to use animals, that scientists are not cruel, and that there are laws" protecting the welfare of laboratory animals.

The office is one of a series of recommendations developed last year by a group of agencies within the Public Health Service working to counter animal activists pressuring the Congress and the executive branch about the use of laboratory animals. The Public Health Service group was cochaired by William Raub, acting director of NIH, and Frederick Goodwin, administrator of the Alcohol, Drug Abuse, and Mental Health Administration.

Regional Workshops Scheduled on Part 3 of Animal Regulations

A series of workshops will be conducted by the National Institutes of Health (NIH) on meeting the reproposed regulations of Part 3 of the Animal Welfare Act, the requirements pertaining to dogs, cats, and nonhuman primates.

The NIH Office for Protection from Research Risks and the University of California, Los Angeles, are cosponsoring the first workshop, to be held September 9-11 at the Lake Arrowhead Conference Center. The workshop is open to institutional administrators, members of animal care and use committees, laboratory animal verterinarians, investigators, and others who have responsibility for institutional animal care and use programs.

For information on the September program, contact Ms. Gitta Walton, Director, Human Subjects and Animal Research Policy, 60956 Factor Building, UCLA, Los Angeles, CA 90024-1694 (213) 825-8714.

For information on future workshops, contact Mrs. Roberta Sonneborn, Executive Assistant for Animal Welfare Education, Office for Protection from Research Risks, National Institutes of Health, Building 31, Room 5B59, 9000 Rockville Pike, Bethesda, MD 20892 (301) 496-7163.

But Was the Check Good?

In April, *The Minneapolis Star-Tribune* reported billionaire Saudi Arabian Prince Muhammad Al-Fassi had written a check for $1 million to a University of Minnesota law student for the purpose of starting an animal rights group, to be called Dogs and Cats Organization. The prince also gave the student a second check for $1,010 to purchase 42 dogs and cats scheduled to be euthanized by the Minneapolis pound.

Then in Miami the prince was charged with animal cruelty after the Greater Miami Humane Society found 32 cats at his mansion, many of which were reported to be sick and dehydrated. Also, the U.S. Immigration and Naturalization Service has issued a warrant for his arrest for allegedly entering the country in 1989 on a bogus visa.

Return of ADAMHA Grant Could Result in Review

The administrator of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) has put universities on notice that a return of a grant for reasons of political pressure, such as animal activist protests, could result in a review of all of the institution's grants.

Frederick Goodwin said ADAMHA "has decided to issue guidelines to all grantee universities of ADAMHA that indicate that if a university in response to political pressure chooses to require one of our grantees to return a grant that has been duly approved and authorized for scientific merit and the proper conduct and humane care of animals, we would consider that to be irresponsible use of federal money.

"We have spent taxpayers dollars to get the grants out to you. We have the responsibility to get the research done. If the university administration, for reasons not related to science, chooses to have that grant returned, then ADAMHA will review all of the grants at that university to see if that university is still capable of receiving federal money."

So They Say . . .

"The goal of the science adviser is not that of representing science and technology, but being able to inject science and technology into major policy discussions and decisions where it has relevance and where other players might not recognize its relevance."

-Allen Bromley, science adviser to the president, in a 1987 speech.

APS Specialty Meeting
In Search of Physiological Principles: The Use of Animal Diversity and Novel Technology
October 6-10, 1990 Orlando, Florida

SATURDAY, OCTOBER 6	2:00-6:00 REGISTRATION	6:00-7:30 OPENING RECEPTION

AM SUNDAY, OCTOBER 7 PM	
8:30-9:30 **LECTURE** Applying the techniques of molecular biology to physiological research.	2:00-5:00 **SYMPOSIUM** Comparative intestinal nutrient transport.
9:30-10:30 **TUTORIAL** Telemetry and data storage techniques in physiological research.	2:00-5:00 **SYMPOSIUM** Comparative aspects of functional morphology of the respiratory system.
10:30-11:30 **TUTORIAL** NMR as applied to biological research.	2:00-5:00 **SYMPOSIUM** Coping with extreme conditions: adaptations of metabolism and epithelial transport mechanisms in invertebrates.
11:30-12:30 **LECTURE** The process of publishing in scientific journals.	5:30-6:15 **DEBATE AND COCKTAILS** How should energy metabolism scale and why?
9:30-12:30 **POSTERS**	6:30-7:30 **LECTURE** Daedalus and beyond: human-powered flight as a model for long-term energetics.
9:30-5:00 **EXHIBITS**	

AM MONDAY, OCTOBER 8 PM	
8:30-9:30 **LECTURE** Adaptation thresholds: when do environmental changes set selection in motion?	2:00-5:00 **SYMPOSIUM** The organization and modulation of homeostatic systems.
9:30-11:30 **WORKSHOP** The doubly labelled water method.	2:00-5:00 **SYMPOSIUM** NMR spectroscopy: a new technology is helping to solve old problems.
11:30-12:30 **LECTURE** Funding grants: view from Washington, D.C.	2:00-5:00 **SYMPOSIUM** Intracellular and extracellular acid-base regulation in animals.
9:30-12:30 **POSTERS**	2:00-5:00 **SYMPOSIUM** Nonmammalian models for the study of cardiovascular and renal homeostasis: integrative and cellular approach.
9:30-5:00 **EXHIBITS**	5:30-6:15 **DEBATE AND COCKTAILS** What is comparative physiology and where is it going?
	6:30-7:30 **LECTURE** The desert rat: where it can lead you.

AM TUESDAY, OCTOBER 9 PM	
8:30-9:30 **LECTURE** The evolution of oxygen carriers.	2:00-5:00 **SYMPOSIUM** Role of concentric granules in nitrogen excretion and ion storage in birds, molluscs and insects.
9:30-11:30 **TUTORIAL** The role of computer simulations in the student laboratory.	2:00-5:00 **SYMPOSIUM** Field physiology: expanding our laboratory horizons.
11:30-12:30 **LECTURE** The use of non-vertebrates to teach physiological principles.	2:00-5:00 **SYMPOSIUM** The comparative physiology of atriopeptin in fishes.
9:30-12:30 **POSTERS**	2:00-5:00 **SYMPOSIUM** Comparative aspects of maximum exercise.
9:30-5:00 **EXHIBITS**	6:00-7:00 **COCKTAILS**
	7:00-8:00 **DINNER AND LECTURE** The Scholander Award Presentation followed by: "How bird eggs breathe."

AM WEDNESDAY, OCTOBER 10 PM	
8:30-9:30 **LECTURE** Cardiovascular and respiratory function in lower vertebrates.	2:00-5:00 **SYMPOSIUM** New insights in vertebrate kidney function.
9:30-11:30 **TUTORIAL** Structuring a curriculum around undergraduate laboratories.	2:00-5:00 **SYMPOSIUM** Control of breathing in fishes.
11:30-12:30 **LECTURE** Animal welfare legislation and the anti-experimentation movement: current developments.	2:00-5:00 **SYMPOSIUM** Comparative aspects of metabolic regulations.
9:30-12:00 **POSTERS**	2:00-5:00 **SYMPOSIUM** The physiology of developing marsupials.

APS Specialty Meeting

In Search of Physiological Principles: The Use of Animal Diversity and Novel Technology

October 6-10, 1990, Orlando, Florida

Comparative Intestinal Nutrient Transport

Chair: R. K. Buddington.
Participants: B. R. Stevens, G. A. Ahearn, C. I. Cheeseman, A. Plaice, W. H. Karason, and E. M. Wright

The field of intestinal transport has advanced rapidly during the last decade. No longer are we simply determining whether organisms can transport specific solutes. We are now able to study the actual proteins. One of the more interesting and productive aspects of transport physiology has been the regulation of the transporters to match the needs of organisms. Most recently the modern methods of molecular biology have been applied in investigations of the expression of genes coding for the specific transporters.

The participants have been selected based on the significant contributions they have made to the field in recent years. The specific topics provide the most up-to-date information on the mechanisms underlying intestinal transport and how the transport processes are regulated. Specifically, Drs. Stevens and Ahearn are well recognized for their studies of the apical intestinal transporters of vertebrates and invertebrates. The recent investigations of Dr. Cheeseman have demonstrated the basolateral transporters to be an integral part of the absorption process that requires additional recognition. The investigations of Dr. Plaice have been instrumental in elucidating the comparative aspects of lipid digestion and absorption. Regulation of the transport processes during development is the focus of Dr. Buddington's research, whereas Dr. Karasov has been largely responsible for our understanding of the regulation of the nutrient transporters in response to changes in dietary inputs. Finally, Dr. Wright's recent isolation and cloning of the intestinal apical Na^+-glucose has made it possible to study the expression of the genes coding for the transporters and examine for interspecies differences in the transporters.

Comparative Aspects of Functional Morphology of the Respiratory System

Chair: P. C. Kosch.
Participants: P. C. Kosch, W. S. Tyler, Y. C. Fung, E. A. Hoffman, L. E. Olson, and J. D. Crapo

The Comparative Respiratory Society (CRS) has sponsored eight national and international symposia on a range of respiratory topics over the past 11 years. In keeping with the overall theme of the APS meeting, the CRS-sponsored symposium will present comparative aspects of functional morphology of the respiratory system. With the use of novel imaging technologies, including rapid CT scanning, NMR, and morphometry based on light and ultrastructural microscopy, leading scientists will present structure-function correlates from studies in a range of comparative species. Several forms of computer-assisted methods will be presented to visualize whole animal structures down to the ultrastructural level with three-dimensional reconstructions.

Coping with Extreme Conditions: Adaptations of Metabolism and Epithelial Transport Mechanisms in Invertebrates

Chaired: M. J. O'Donnell.
Participants: J. A. T. Dow, S. H. Wright, K. Beyenbach, T. J. Bradley, S. W. Nicolson, J. E. Phillips, J. Machin, and M. J. O'Donnell

Studies of the physiology of animals in extreme conditions can provide much information on transport mechanisms used for osmoregulation and nutrient uptake. This symposium examines adaptations of metabolism and epithelial transport associated with the movement of organic solutes, salts, and water against extremely large thermodynamic gradients in invertebrates. Recent advances in our understanding of the mechanisms used for production of high salt concentrations (>3 M) and pH (>12) in the midgut of terrestrial anthropods and for the uptake of dissolved organic materials from low (10^{-6} M) and environmental concentrations will be presented. A number of insect species cope with massive dietary or osmotic fluxes of water and salts, and the cellular mechanisms for homeostasis and their hormonal control will be discussed. The symposium participants are an international group of comparative physiologists, and their work frequently involves comparisons of transport mechanisms in invertebrates with comparable mechanisms in vertebrates. The presentations include studies at the whole organism, cellular, and molecular levels of organization as well.

Participating Societies

American Physiological Society

American Society of Zoologists
(Division of Comparative Physiology and Biochemistry)
(Division of Comparative Endocrinology)

Canadian Society of Zoologists
(Comparative Physiology and Biochemistry Section)

Comparative Respiratory Society

Society of Experimental Biology (United Kingdom)

Debate: How Should Energy Metabolism Scale and Why?

Moderator: J. S. Turner.
Participants: A. A. Heusner, J. A. Prothero, and W. A. Calder, III

Body size is the single most important determinant of energy metabolism of animals. How body size affects energy metabolism has long been thought to be governed by the "3/4 power rule" that states that basal metabolic rate scales to the 3/4 power of body mass. In recent years, this rule has come under criticism on a number of theoretical, empirical, and statistical grounds. It is the purpose of this debate to air some of the important features of this argument and, one hopes, to identify some of the major untested dogmas in this problem that might govern future research. The participants will consider the question: Is a power equation the appropriate way to express the scaling of energy metabolism? Is the expected scaling exponent for basal metabolism 2/3 or 3/4? What are the theoretical foundations for the "3/4 power rule"? What is the evidence from nature that energy metabolism of animals actually scales to any particular power of body mass?

The Organization and Modulation of Homeostatic Systems

Chair: L. I. Crawshaw and H. C. Heller.
Participants: H. C. Heller, D., Edgar, R. Lydic, L. I. Crawshaw, and R. M. Bryan

Homeostatic systems have been classically viewed as simple feedback mechanisms to stabilize the *milieu interior*. Recently, it has become clear that these systems orchestrate complicated changes in the body that alter regulated variables in subtle ways to optimize performance or efficiency or ensure survival. Advances in understanding homeostatic systems have involved a clarification of both the organization of these systems and how they are modulated by different conditions. Because homeostatic systems provide an important input to hypophyseal function, we have included a talk in this important area. We are confident that the similar goals of the speakers will provide a forum where advances in and syntheses of the material can be arrived at.

NMR Spectroscopy: A New Technology is Helping to Solve Old Problems

Chair: B. M. Hitzig.
Participants: R. Stephenson, D. Jones, J. Ingwall, P. Okunieff, W. R. Ellington, B. M. Hitzig, and P. W. Hochachka

In vivo NMR spectroscopy is providing physiologists with a very effective tool for examining the relationship between regulatory processes on an organ system level and intracellular homeostatic mechanisms. This symposium will discuss examples of new and creative uses of NMR spectroscopy to answer questions that are not approachable using other techniques. We will provide diversified examples of new insights into intracellular energy metabolism and acid-base homeostasis in species ranging from invertebrates to humans. Established theories of acid-base homeostatis, cardiac and skeletal muscle metabolism, tumor growth and oxygen utilization, cation movement, and glycolytic regulation during hypoxia will be discussed. New or supplemental hypothesis resulting from these NMR studies will be advanced. We intend to bring to the audience an encompassing overview of the uses and limitations of NMR spectroscopy, as well as the kinds of physiological problems that can be approached with this technique. The symposium participants are recognized experts in their particular fields. We anticipate an informative and scientifically rewarding experience for both audience and speakers.

Nonmammalian Models for the Study of Cardiovascular and Renal Homeostasis: Integrative and Cellular Approach

Chair: H. Nishimura.
Participants: H. Nishimura, P. K. T. Pang, H. B. Lillywhite, E. J. Braun, R. F. Wideman, Jr., and S. M. Galli

The overall aim of this symposium is to introduce diverse nonmammalian animal models for the study of cardiovascular and renal homeostasis. This symposium will present integrative and cellular approaches to elucidate given aspects of cardiovascular and renal functions and discuss their implications to biomedical research. The symposium will specifically address: *1)* use of renin secretory cells from aglomerular teleosts, the role of inhibitory calcium messenger in the cellular transduction pathway for the control of renin release and renal baroreceptor; *2)* mechanisms of actions of cardiovascular hormones that open a calcium channel in one tissue, while inhibiting cellular calcium mobilization in another, using patch-clamp technique on vascular smooth muscle and cardiac cells from amphibians, birds, and mammals; *3)* structural and functional adaptation of blood circulation and cardiovascular system of snakes to hydrostatic pressure gradients and diverse habitats and behavior; *4)* use of a unique fowl model of nephrogenic diabetes insipidus that appears to be inherited via an autosomal recessive gene, the mechanism of antidiuretic hormone action on cardiovascular and renal systems and its control; *5)* control of renal hemodynamics and tubular secretion through the renal portal circulation, which dissociates tubular from vascular mechanisms; and *6)* use of euryhaline fish models from environments of different salinity, physiological mechanisms by which vasoactive and natriuretic peptides contribute to the maintenance of volume and osomotic balance. Discussion on the above models, which serve as valuable tools for biomedical research, will provide insights into and perspectives on adaptation of bodily function to changing environments.

Intracellular and Extracellular Acid-Base Regulation in Animals

Chair: P. J. Walsh and L. E. Burnett.
Participants: J. Cameron, C. Barnhart, M. Wheatley, C. Wood, S. Thomas, T. Mommsen, and N. Jones

Although regulation of extracellular acid-base status in animals has been well described at the whole organism level, we are at an exciting juncture in this field in several regards. First, mechanisms of intracellular pH regulation are becoming clearer. Second, the integrative role of hormones (eg, catecholamines) is emerging. Finally, the role of metabolic regulation of (and by) acid-base status is just beginning to be appreciated. This symposium will bring together researchers examining acid-base regulation in five different taxonomic groups (including humans) representing both terrestrial and aquatic lifestyles. Additionally, these researchers emphasize several different approaches (eg, hormonal effects, responses to exercise and environment, metabolic biochemistry). This interaction will lead to important new perspectives on the field.

Debate: What Is Comparative Physiology and Where Is It Going?

Moderator: W. K. Milsom.
Participants: C. R. Taylor, D. R. Jones, G. N. Somero, S. C. Hand, A. F. Bennett, M. S. Gordon, and V. H. Shoemaker

The Role of Concentric Granules in Nitrogen Excretion and Ion Storage in Birds, Molluscs, and Insects

Chair: T. J. Bradley and E. Braun.
Participants: J. S. Buckner, M. O'Donnell, T. J. Bradley, T. Dietz, and E. Braun

It has long been known that birds and insects share the capacity to use uric acid as a major nitrogenous waste product. Recently, researchers examining the physiology of excretion in these animal groups have been struck by the similarity of the ultrastructure of crystals produced in these two phylogenetically disparate animal groups. Both groups produce round concentric granules. These granules do not conform to the crystal structures produced when pure uric acid crystals form in solution, suggesting other organic components produced by the animals may influence the form of the crystals.

Similar concentric granules containing high concentrations of divalent ions, carbonates, and phosphates have also been observed in molluscs and insects. These granules appear to participate in a process of ion storage and excretion. It is apparent, therefore, that the production of concentric granules is widespread in the animal kingdom, these granules can be produced both intra- and extracellularly, and the ultrastructure of the crystals is largely independent of their ionic makeup.

This is the first time this topic has been reviewed in a comparative context. There is now considerable information available from several laboratories on a phylogenetically broad set of animals. A review of these topics is currently very timely and will promote an improved understanding of the role of biological materials in the deposition and shaping of biogenic crystals.

Field Physiology: Expanding Our Laboratory Horizons

Chair: M. Castellini and D. P. Costa
Participants: A. Yayanos, M. Hagedorn, M. A. Castellini, G. Worthy, Y. LeMaho, and D. P. Costa

This symposium was created for speakers to present ways and examples in which field and comparative approaches provide options for styding and answering physiological problems that can't easily be studied in the laboratory. This would include discussions of how field studies integrate with laboratory experiments to help understand physiological adaptations and limits. For example, recent techniques have allowed investigators to monitor the at-sea metabolic rate of freely ranging seals and sea birds. These studies can be compared to work in laboratories that measure metabolic rate under precise swimming conditions, and the combined effort can help define the real cost of foraging at sea. By combining presentations from many different fields, the symposium will demonstrate how the process of field physiology can be carried out on questions ranging from amphipods to whales.

The Comparative Physiology of Atriopeptin in Fishes

Chair: D. H. Evans.
Participants: T. Inagami, D. H. Evans, K. R. Olson, S. M. O'Grady, R. J. Solomon, and Y. Takei

Atriopeptin is a peptide hormone that has been shown to decrease mammalian blood pressure by vascular smooth muscle vasodilation and natriuresis. Because fishes face chronic hypervolemia and hyponatremia in fresh water and chronic hypovolemia and hypernatremia in sea water, one might suspect, *a priori,* osmoregulatory hormones such as atriopeptin might be important in their physiology. An emerging literature has demonstrated that this is probably now the case. Mammalian atriopeptin (and cardiac extracts) have now been shown to be natriuretic and vasorelaxant in various fish species. In addition, relevant epithelial transport systems in the fish gut, gill and rectal gland are also either inhibited or stimulated by mammalian AP, and immunoreactive AP has been quantified in fish plasma. Interestingly, AP_{ir} levels decline, rather than increase, in fresh water. The first fish AP has now been isolated, sequenced, and synthesized. The symposium participants are authors of much of this literature, and this initial symposium will provide a baseline for future research in the evolution of structure and function of vertebrate atriopeptins.

Comparative Aspects of Metabolic Regulations

Chair: E. M. Plisetskaya and T. P. Mommsen.
Participants: C. B. Cowey, T. W. Moon, M. A. Sheridan, R. DeRoos, M. Watford, B-J. Chen, M. Ramenofsky, K. B. Storey, and J. J. Stegeman

The purpose of this symposium is to exchange contemporary ideas concerning regulation of metabolism in different representative groups of vertebrates, namely, fish, amphibians, reptiles, birds, and mammals. This will provide an update on the role that metabolytes, hormones, and neurotransmitters play in adjusting the metabolic processes to the environmental changes from moderate to extreme. Speakers coming from different fields, physiology, biochemistry, pharmacology, and toxicology, will specifically address roles of temperature and feeding-starvation conditions and how they affect organisms at particular stages of their lifecycle.

Fish and birds successfully accomplish long-lasting migrations, which demand accumulation of large energy stores and, subsequently, their efficient use. Comparison of multiple regulatory mechanisms involved will provide new insight into their coordination and integration. Similarities in the mechanisms controlling metabolism, common for all vertebrates, and the peculiar mechanisms employed by different vertebrate groups to cope with extreme conditions, such as freezing temperatures, estivation, or toxicants, will be discussed by the participants, all of whom are national or international experts in their fields. The increasing role of non-mammalian vertebrates as valuable models in modern metabolic studies will be considered as well. Collective "brain attack" of the outstanding scientists will allow the participants to evaluate and determine future directions for metabolic research.

Comparative Aspects of Maximum Exercise

Chair: P. D. Wagner.
Participants: O. Mathieu-Costello, J. Jones, T. Farrell, S. Hillman, P. Butler, and P. D. Wagner

The transport of oxygen to, and utilization of oxygen by, maximally exercising skeletal muscle requires the integrated interaction of several well-known steps in the oxygen transport pathway. The key components are oxygen uptake in the lung (or gill), convective transport of oxygen to the muscle involving cardiovascular function and hemoglobin-associated O_2 transport, and oxygen unloading from the muscle capillary blood with subsequent movement to the mitochondria. The focus of this symposium will be to compare these components of oxygen transport and muscle function under conditions of maximum exercise across a wide range of species. Included will be fish, toad, bird, horse, and human. This symposium will begin with an introduction to the major differences and similarities in muscle structure across this species range, focusing on fiber and capillary geometry. The second introductory talk will be similarly broad and address oxygen transport and muscle function over the same species. After these, four specific presentation of how maximum oxygen uptake is achieved in fish, amphibians, birds, and mammals will be given. The intent is to present a rather homogeneous analytical approach to a wide range of species. In this way, we expect to uncover differences and similarities in the strategies used by the various species to achieve maximum exercise. This should allow more insight into the determinants of maximum oxygen transport and utilization.

New Insights in Vertebrate Kidney Function

Chair: K. Beyenbach.
Participants: K. Beyenbach, J. A. Brown, J. C. Rankin, W. H. Dantzler, C. De Rouffignac, E. Braun, and H. Nishimura

The aim of this symposium is to bring together international experts currently active in the study of vertebrate kidney function, thus permiting a wide discussion and integration of information obtained by experimental studies at many different levels, from isolated membrane preparations to the whole animal, and in different vertebrate groups. The symposium will permit exchange of ideas relating to recent methodological developments in approaches to renal studies and deal with advances in understanding specific aspects of renal mechanisms and their control. An associated poster session will enable other scientists to contribute specific papers complementing the overviews presented in the symposium.

Young Investigator Scholander Award Competition

The Comparative Physiology Section Scholander Award will be presented to an outstanding young investigator presenting a paper as first author in a comparative physiology poster session. The recipient must be a graduate student or postdoctoral fellow, not more than five years beyond the highest degree. A cash prize and certificate will be presented during the Tuesday night dinner and lecture, October 9, 1990, Orlando, FL.

The Physiology of Developing Marsupials

Chair: R. A. B. Holland.
Participants: L. A. Hinds, P. A. Janssens, R. V. Baudinette, R. A. B. Holland, G. K. Snyder, and N. R. Saunders

Marsupials are born at a much earlier stage of development than are the more usual placental mammals. This provides unique opportunities for research in two different areas. First, one can examine how the new born marsupial adapts to independent existence at this immature stage; and second, many aspects of development are much more easily studied in an animal that is maturing outside the mother.

This symposium will deal with the adaptation to air breathing at the immature stage by considering how the blood is suited for gas exchange in the immature lung, and how the lung and cardiovascular system adapt at birth to the new conditions. Also considered will be the development of the brain, which is accessible to study from its very rudimentary stage at birth; the development of metabolism while the young marsupial is in the pouch; and the unique features of reproduction in marsupials enabling the Tammar Wallaby to suspend development of a very early embryo until conditions are favorable for the pregnancy to proceed.

The symposium as a whole will give an overall picture of many features of marsupial development and enable them to be compared with development in the placental mammals. Discussion will bring out the role of marsupials as models in biomedical research.

Control of Breathing in Fishes

Chair: S. F. Perry and W. K. Milsom.
Participants: P. Laurent, W. K. Milsom, M. L. Burleson, N. S. Smatresk, S. F. Perry, R. Kinkead, E. W. Taylor, D. J. Randall, and C. M. Wood

There has been a growing controversy in the literature concerning the control of breathing in fishes, particularly with regard to the role of circulating catecholamines. Until recently, it was believed teleost fishes showed a brisk hypoxic ventilatory response, mediated primarily by central oxygen chemoreceptors. The location of these receptors was unknown. It was also believed the hypercapnic ventilatory response exhibited by many species was due exclusively to changes in arterial oxygen partial pressure resulting from the Bohr effect of the change in arterial carbon dioxide partial pressure. More recently, it has been shown that hypoxia, hypercapnia, and exercise all lead to increases in circulating levels of plasma catecholamines and, in some studies, beta-adrenergic blockers eliminate much, if not all, of the ventilatory response to these respiratory stimuli. Furthermore, Heyman's type chemoreceptors have recently been described in the gills of fish, and denervation of these receptors, at least in some species, eliminates much, if not all, of the hypoxic ventilatory response. Beta-blockade also eliminates much hypoxic response of this chemoreceptor group. Finally, there is some evidence to suggest fish respond to changes in arterial P_{CO_2}, per se and not just to changes in P_{O_2}. This new data drastically alters the way in which the control of ventilation in fishes has traditionally been viewed and has given rise to conflicting new hypotheses. The participants in this symposium represent the major laboratories contributing to the current controversies and also represent all four of the societies co-sponsoring this meeting. Although contributed papers from many of these laboratories have given rise to much discussion at recent meetings, there has been no concerted attempt to bring the different groups, approaches, and ideas together at one meeting. It is hoped this symposium will contribute toward a synthesis of the new data and ideas and may give rise to a more parsimonious explanation of the control of ventilation in fish.

Introducing . . .

Dale J. Benos

On July 1, Dale J. Benos becomes editor of the *American Journal of Physiology: Cell Physiology,* replacing Philip Knauf. The newly appointed editor is professor of physiology and biophysics at the University of Alabama at Birmingham and a senior scientist in the Gregory Fleming James Cystic Fibrosis Center and the Nephrology Research and Training Center.

He received much of his training under two past presidents of the American Physiological Society. Studying under Bodil Schmidt-Nielsen, he earned a bachelor's degree in biology in 1972 at Case Western Reserve University. In 1976 he received his PhD degree from Duke Univesity, where his thesis advisor was Daniel C. Tosteson. Following two years of postdoctoral study at Duke, Dr. Benos joined the faculty at Harvard Medical School, where he was assistant and associate professor and an Andrew W. Mellon Scholar. In 1985 he moved to Birmingham.

Benos' research interests are wide and varied. His major interest lies in epithelial ion transport, specifically amiloride-sensitve Na^+ channels and Cl^- secretion. However, he has worked on invertebrate transport systems, mammalian erythrocytes, preimplantation mammalian blastocysts, planar lipid bilayers and vesicles, and the metabolic actions of antifertility agents in cultured in vivo and cell systems.

One of his major goals as editor of *AJP:Cell Physiology* is to shorten the time from manuscript submission by the author to first reply. He also intends to broaden the journal's scope by encouraging articles using the newer techniques of molecular biology, genetics, immunochemistry, magnetic resonance, and fluorescence. Benos will retain as associate editors Raymond Frizzell, Sergio Grinstein, Melvyn Lieberman, and Lazaro Mandel. Dennis Ausiello, Robert Balaban, Craig Malbon, and James Stull have been appointed as new associate editors.

Physiology in Developing Countries

The APS has established a clearinghouse designed to link physiologists in the United States with scientists from developing countries. The Clearinghouse for Developing Countries was a result of Past President Harvey V. Sparks' experience working in Zimbabwe. He suggested to the Council that APS members might be interested in helping physiologists in developing countries. Whether the assistance involved sending books or journals, establishing a sister department relationship, or serving as a host for a scientist, the effort of an APS member would be a worthwhile contribution toward strengthening the infrastructure of the country.

The initial announcement of the clearinghouse produced expressions of interest from 20 APS members. The IUPS Congress and a workshop on teaching physiology in developing countries provided the Society with the names of 49 scientists from 30 developing countries who were interested in making contacts with APS members. Some of these scientists have been matched with APS members. However, there still remain a number of scientists seeking contact with APS members. If you would like to assist a scientist in a developing country, please complete the clearinghouse questionnaire below.

Clearinghouse Information Form

Name _____

Address _____

_____

_____

_____

I am interested in

____ Hosting a scientist from a developing country

____ Hosting a graduate student from a developing country

____ Working in a developing country

____ Sending books, journals, and/or teaching materials to a developing country

____ Initiating a "sister department" relationship with a department in a developing country

Other _____

Expertise: Research _____ Teaching _____

Would you be able to partially support a visitor? _____

Do you speak a foreign language? _____

What language? _____

Have you previously worked in a developing country? __

If so, where? _____

Does your department currently have a "Sister Department" relationship with a department in a developing country? If so, please attach a description.

Please relate to us any other experience that may be of use to us in setting up a clearinghouse.

Thank you for your assistance!

This past year sadly saw the passing of two highly respected physiologists who served on the Editorial Board of AJP: Heart and Circulatory Physiology *with dedication and tireless effort. Dr. Kiichi Sagawa, Professor of Biomedical Engineering at Johns Hopkins University School of Medicine, and Dr. Melvin L. Marcus, Professor of Internal Medicine at the University of Iowa College of Medicine, will be remembered for their numerous contributions to both the American Physiological Society and the entire biomedical community as well.*

Kiichi Sagawa

(1926-1989)

Dr. Kiichi Sagawa died of cancer on August 22, 1989, at the age of 62. He was internationally recognized for his investigations on the control of circulation and the heart. Born and raised in Japan, he received his MD and PhD degrees in his homeland and came to the United States in 1959 as a postdoctoral fellow at the University of Mississippi. After serving on their faculty, Dr. Sagawa moved to Case Western Reserve University in Cleveland, Ohio, in 1968, the same year in which he became a naturalized US citizen. In 1971, he joined the faculty at Johns Hopkins University School of Medicine, where he served until the time of his death.

In addition to serving on our Editorial Board, Dr. Sagawa also served as an associate editor for the Heart section of AJP from 1977 to 1980. He likewise received various honors and awards during his long career, including the Carl J. Wiggers Award from the APS and a MERIT Award from the National Heart, Lung, and Blood Institute. Dr. Sagawa was also a recipient of the National Honor Award from the Japanese Ministry of Education for his contributions to scientific collaboration between Japan and the United States.

Although he made many contributions to physiology, Dr. Sagawa's model of cardiac function based on a variable elastance is widely used today by both basic and clinical scientists to assess cardiac function. Dr. Sagawa was an outstanding researcher and teacher, whose influence was felt both by the international scientific community and the students he diligently strived to train. He is survived by his wife, Toshi, and one son.

Melvin L. Marcus

(1940-1989)

Dr. Melvin Marcus passed away on October 19, 1989, at the age of 49. A victim of cancer, he was serving his second term on the Editorial Board of *AJP: Heart* at the time of his death.

Dr. Marcus was a highly respected cardiologist at the University of Iowa College of Medicine. He graduated from medical school at the University of Wisconsin and completed his internship and residency at the Bronx Municipal Hospital Center in New York City. He joined the faculty at the University of Iowa in 1973, after serving as an Army cardiologist at Fort Dix, New Jersey. He was promoted to full professor in 1980.

In addition to teaching medical students and caring for patients at the University of Iowa, Dr. Marcus directed several research projects, five of which were funded by the National Institutes of Health at the time of his death. He received several honors and awards, including an honorary fellowship in the American College of Chest Physicians in 1989.

Dr. Marcus served on the editorial boards of nine professional journals. He was the principal or coauthor on more than 300 research articles, and, for the last 11 years, he served as advisor to the University of Iowa Medical Student Research Club.

Dr. Marcus was a valued scientist and friend whose contributions to our field will always be highly regarded. His studies on coronary circulation will certainly continue to provide a foundation for both basic and clinical research. He is survived by his wife, Rita, and children.

Membership Statistics

Total Membership	6,857

Distribution by Employment (6,390 Respondents)

	No.	%
Medical schools	4,250	65
Physiology departments	2,101	32
Other preclinical departments	522	8
Clinical	1,560	24
Administration	67	1
Hospitals and clinics	286	4
Veterinary schools	141	2
Dental schools	46	1
Public health and graduate schools	114	2
Undergraduate schools	792	12
Commercial companies	192	3
Government	412	6
Institutes and foundations	202	3
Private practice	50	1
Other, emeritus or inactive	64	1

Distribution by Racial Background and Heritage (Optional personal data)

	Total respondents
American Indian or Alaskan	12
Asian or Pacific Islander	380
Black	46
White	5,037
Hispanic	108

US States with More Than 100 Members (50 States plus Puerto Rico and Virgin Islands)

California	701
New York	639
Texas	394
Maryland	361
Pennsylvania	356
Massachusetts	330
Illinois	316
Ohio	248
Michigan	197
Florida	187
New Jersey	185
North Carolina	179
Missouri	150
Virginia	130
Connecticut	125
Wisconsin	119
Minnesota	112
Tennessee	108
Indiana	105
Georgia	103
Washington	100

Distribution by Sex (Optional personal data)

	Total respondents
Female	748
Male	5,534

APS American Membership

US	6,335
Canada	312
Argentina	4
Brazil	12
Mexico	10
Peru	1
Chile	5
Venezuela	4
Jamaica	2
Guatemala	1

Canadian Provinces with 5 or More Members

Ontario	120
Quebec	80
Alberta	34
British Columbia	33
Manitoba	23
Nova Scotia	10
Saskatechewan	8

Other provinces represented
New Brunswick
Newfoundland
Prince Edward Island

APS Membership Outside the Americas (Countries with 5 or more members)

Japan	55
Federal Republic of Germany	46
United Kingdom	38
Switzerland	26
Italy	23
Australia	17
France	17
Netherlands	16
Belgium	12
Israel	12
Sweden	10
Spain and Canary Islands	10
Norway	9
Denmark	8
Taiwan	6
Austria	5
PRC	5
Greece	5
Hungary	5

Distribution by Earned Degree (6,407 Respondents) (Includes 892 individuals with multiple doctorate degrees)

PhD	4,429
MD	2,540
DDS and other	160
DVM	154

Principle Type of Work (6,559 Respondents)

	%
Research	72
Teaching	13
Administration	7
Clinical	7
Other	1

Statistics represent membership as of April 1990

Distribution of Age (Optional personal data)

	Total respondents
70+	677
60-69	1,230
50-59	1,577
40-49	2,021
30-39	1,064
20-29	103

Distribution by Primary Specialty (6,461 Respondents)

	%
Cardiovascular	23
Neurophysiology	11
Respiration	12
Endocrine	8
Gastrointestinal, food, and nutrition	6
Renal	6
Muscle and exercise	6
Electrolyte and water balance	5
Cellular and tissue	4
Environmental	3
Comparative	2
Blood	2
Energy metabolism and temperature regulation	2
Pharmacology	2
Reproduction	2
All other categories (none 1%)	6

Other countries represented

Czechoslovakia
Finland
Hong Kong
Iceland
India
Indonesia
Kuwait
New Zealand
Nigeria
Philippines
Poland
Portugal
Saudi Arabia
South Africa
South Korea
Thailand
USSR
United Arab Republic
Yugoslavia

ACDP STATISTICS
(Continued from p. 49)

cated the number of responding departments in parentheses at the beginning of each section.

All figures relating to salaries, stipends, and budgets are in whole U.S. dollars. Those dollar values that were reported as Canadian dollars were converted as follows: $1.00 Canadian to $0.847 U.S. Minimum, maximum, and mean salaries have been determined for chairs, professors, associate professors, assistant professors, and instructors (without regard to sex), along with percentage change from last year's averages. Separate salary calculations have also been made for women holding the faculty positions listed above. Please note that salary figures are given for only 196 of the 208 (94.2%) women faculty reported. Average salaries have been determined with respect to the number of years a faculty member has been at his/her current rank. In addition, we have also included minimum, maximum, and average salaries by region (Northeast, Midwest, South, West, and Canada). Puerto Rico is not reported in the regional salary tables.

As was done in the past, the amount of extramural research funds has been compared with research space and number of faculty. Departments were ranked according to research space and assigned a "space rank" with one being the department with the greatest amount of space. The complete ranking of all departments according to funded outside research grants is listed along with total space, grant income, and space per faculty.

Information regarding graduate programs (stipends, sources of support, areas of study/research) also is included, although in a more generalized form than used in the past.

For some of the analysis, surveys were divided into three categories: *1)* those from public medical schools (those with MD/DO programs), *2)* those from private medical schools (also with MD/DO programs), and *3)* those from nonmedical schools (including dental, podiatric, and veterinary schools). Unless otherwise stated, all numbers represent totals from all surveys and numbers in parentheses represent the average number per department.

Types of Institutions

Physiology departments primarily in medical (MD/DO) (96) or nonmedical (7) schools. Types of schools specified as nonmedical: dental (1), podiatric (1), veterinary (3), and other (2).

Primary affiliation: public (70) or private (33).

Number of faculty with academic appointments (regular or joint in your department.

Figures shown are for the total number of faculty. Numbers in parentheses are average number of faculty per department.

(103 responses) SUM = TOTAL = SUM

Degree(s) Held

	PhD only	MD only	Both	Other	Number of Faculty	Tenured	Not Tenured
Entire salary paid through your dept:							
Fulltime	1,239 (12.06)	97	55	37	1,432 (13.90)	929 (9.02)	503 (4.88)
Parttime	35	10	3	8	58	11	46
Part of salary paid through your dept., associated with:							
Other basic sci. dept.	39	2	0	1	42	24	17
A clinical dept	23	22	5	2	52	33	19
No salary paid through your dept., associated with:							
Other basic sci. dept.	199	27	10	7	243	140	77
A clinical dept.	155	194	34	11	394	179	120
Other (Emeritus, etc.)	184	39	21	5	249	80	89

TABLE 1: **Faculty Salaries for Fiscal Year 1989-1990**

	Mean	Change from 88-89 Survey	Min	Max	# of Faculty
Chairman					
All Schools	$97,259	6.69%	$37,076	$148,842	98
Medical Public	97,929	4.75%	37,076	147,564	65
Medical Private	99,828	5.74%	40,400	148,842	26
Nonmedical	81,492	13.64%	54,695	100,000	7
Female					
Professors					
All Schools	70,351	3.14%	42,272	142,463	550
Medical Public	68,698	1.42%	42,272	137,000	394
Medical Private	80,596	11.19%	25,000	142,463	121
Nonmedical	69,372	9.47%	43,333	107,015	35
Female	72,097	4.95%	47,000	117,671	39
Associate Professors					
All Schools	50,977	2.28%	33,000	70,000	404
Medical Public	51,900	4.31%	35,775	72,219	272
Medical Private	54,892	7.48%	27,740	88,770	102
Nonmedical	52,614	8.06%	42,948	65,267	30
Female	51,187	4.03%	35,775	77,000	63
Assistant Professors					
All Schools	41,216	5.50%	25,000	76,230	318
Medical Public	42,079	7.69%	27,553	76,230	182
Medical Private	41,973	6.20%	25,000	57,200	122
Nonmedical	40,787	6.54%	25,000	47,867	14
Female	42,320	10.20%	27,941	76,230	75
Instructors					
All Schools	28,344	5.10%	16,479	45,980	49
Medical Public	28,474	4.19%	21,175	39,144	26
Medical Private	28,198	6.89%	16,479	45,980	23
Nonmedical	0	0.00%	0	0	0
Female	25,868	0.68%	21,175	35,645	18

Percent of fulltime faculty in each discipline:

Cardiovascular	17%	Muscle/Exercise	18%
Cell/Tissue	12%	Neural	4%
Comparative	1%	Renal	5%
Endocrine	9%	Reproduction	4%
Environmental	1%	Respiration	6%
Gastrointestinal	4%	Special Senses	2%
General	2%	Transport	6%
Molecular Biology	5%	Other	4%

Other: Biophysics, Computer Science, Metabolism, Nutrition, and Teaching)

Unfilled faculty positions:

Professor	15	Associate Professor	19
Assistant Professor	90	Instructor	2

How many of the unfilled positions due to:

Creation of new FTE's	51	Failure to promote/tenure	7				
Death	6	Retirement	18	Resignation	36	Other	9

Estimated number of junior positions expected to become vacant in the next five years due to retirement, new FTE's, etc.
yr. 1: 44 yr. 2: 62 yr. 3: 44 yr. 4: 43 yr. 5: 34

Current Graduate Students and Postdoctoral Fellows

Total number of graduate students enrolled in all departments' PhD program 1,327 (103 responses)
Total number of foreign graduate students enrolled in all departments' PhD program 437 (32.9%) (103 responses)
Areas of origin (in %) for foreign graduate students (91 responses)

European/Canadaian/ Aust/NZ	14%	African	0%
Asian/Pacific Islander	77%	Central/South American	5%
Middle Eastern	4%	Other origin	0%

Source of support (in %) for foreign graduate students (91 responses)

Institutional	50%	Private Foundations	5%
Research Grants	35%	Other	10%

Total number of postdoctoral fellows currently in all departments 783
Total number of foreign postdoctoral fellows currently in all departments 400 (51.1%)
Areas of origin (in %) for foreign postdoctoral fellows (89 responses)

European/Canadian/ Aust/NZ	42%	African	2%
Asian/Pacific	45%	Central South American	7%
Middle Eastern	4%	Other origin	0%

Source of support (in %) for foreign postdoctoral fellows (85 responses)

Institutional	7%	Private Foundations	11%
Research Grants	71%	Other	11%

Number of vacant postdoctoral positions 84 (93 responses)

Training Support

Number of departments with/without training grants that support predoctoral trainees? Yes 33 No 68

Number of departments with/without training grants that support postdoctoral trainees? Yes 32 No 69

		Predoctoral	Postdoctoral
Average starting stipend per year for trainees (83 respones)	Min.	$ 6,552	$15,996
	Mean	$10,260	$19,373
	Max	$23,892	$28,452

Average percent of tuition paid by predoctoral trainee? 29.43%

Percentage of pre- and postdoctoral trainees supported by:	Predoctoral	Postdoctoral
Training grants	11%	13%
Individually federally funded awards	3%	10%
Research grants	30%	56%
State funds	22%	2%
Private foundations	3%	11%
Institutional awards	17%	3%
Medical scientist training program	6%	0%
Other	8%	5%

Other: (American Heart Assn. State Affiliate; APS; departmental funds; Easter Seal; endowment; foreign government; industry; Organization of American States; other school; parttime employment; self/personal funds; USAF)

Number of trainees who have finished doctoral or postdoctoral work during the year ending June 30, 1989:

	Predoctoral	Postdoctoral
Total number finishing	184	201
Females	74	40
Blacks	9	3
Other minorities	20	39

Total number finishing in each discipline (74 responses)

	Predoctoral	Postdoctoral
Cardiovascular	23%	17%
Cell/Tissue	13%	11%
Comparative	0%	0%
Endocrine	9%	12%
Environmental	1%	0%
Gastrointestinal	5%	6%
General	1%	2%
Molecular Biology	4%	10%
Muscle/Exercise	7%	4%
Neural	17%	18%
Renal	1%	3%
Reproduction	8%	8%
Respiration	5%	4%
Special Senses	3%	0%
Transport	3%	5%

Number of trainees needing placement (61 responses)

Information regarding applicants to graduate programs

Total applicants to all departmental PhD programs this year 2,416 (96 responses)

Total accepted?	571
Total enrolled?	346

TABLE 2. **Average Salary by Number of Years**

Chairmen			Professors			Associate Professors			Assistant Professors			Instructors		
Years	Salary	No. of Faculty	Years	Salary	No. of Faculty	Years	Salary	No. of Faculty	Years	Salary	No. of Faculty	Years	Salary	No. of Faculty
0-5	$ 89,671	40	0-5	$69,016	164	0-5	$51,727	229	0-5	$40,788	278	1-5	$28,324	45
6-10	99,095	23	6-10	69,950	118	6-10	52,497	98	6-10	46,702	26	6+	28,571	4
11-15	102,874	18	11-15	73,128	114	11-15	54,088	50	11-15	46,225	6			
16-20	105,445	11	16-20	78,092	88	16-20	58,452	20	16-20	38,240	4			
21-25			21-25	84,646	55	21-25	49,848	5	21-25	45,477	4			
26+	106,755	5	26+	73,484	9	26+	63,643	2	26+	0	0			

TABLE 3. **Salaries by Region**

	Mean	Minimum	Maximum	No.
Chairmen				
Northeast Region	$105,055	$40,400	$148,842	19
Midwest Region	96,300	51,309	136,886	26
South Region	99,267	37,076	137,877	31
West Region	97,719	49,500	147,564	15
Canada	74,659	46,908	105,978	6
Professors				
Northeast Region	82,804	53,712	142,463	115
Midwest Region	71,502	46,007	107,000	136
South Region	71,062	48,600	137,000	142
West Region	73,642	25,000	163,520	111
Canada	60,684	42,272	83,017	44
Associate Professors				
Northeast Region	56,645	27,740	88,770	84
Midwest Region	52,340	33,000	70,000	113
South Region	51,829	37,980	77,000	138
West Region	53,382	39,060	87,000	38
Canada	46,240	35,775	62,285	31
Assistant Professors				
Northeast Region	42,514	28,014	57,200	75
Midwest Region	43,449	29,394	64,051	96
South Region	40,822	25,000	62,093	94
West Region	43,848	25,000	56,000	29
Canada	37,696	27,941	76,230	21
Instructors				
Northeast Region	28,151	16,479	45,980	18
Midwest Region	30,091	24,000	35,645	6
South Region	26,692	20,846	42,000	16
West Region	33,156	31,968	33,804	5
Canada	28,251	21,175	39,144	3

Northeast Region:	ME NH VT NY MA RI CT NJ PA MD DE DC
Midwest Region:	MI OH IN IL WI IA MO KS NE ND SD MN
South Region:	VA WV KY TN NC SC GA FL AL MS AR LA OK TX
West Region:	AK HI MT WY CO NM AZ ID NV WA OR CA UT

Average GRE score of those accepted? V 512.82 Q 654.59 A 591.74

The equivocal nature of this question prompted us to report averages of total scores only; 76 departments reported verbal and quantitative scores and 72 departments reported all three scores.

Departmental faculty (103 responses)

How many of your faculty members are	Female	208	14.65%
	Black	14	0.98%
	Other Minorities	100	7.01%

Departmental budget for fiscal year 1989-1990 (Salaries and Operations) (103 responses)

	Mean	Minimum	Maximum
Institutional Sources	1,066,399	19,250	4,140,600
Outside Research Grants (Direct Costs Only)	1,616,389	0	6,273,160
Training Grants (Direct Costs Only)	190,156	0	1,848,970
Other Budget Support Identify "Other"	173,258	0	2,532,915
Total	3,046,212		

What percent of total faculty salaries supported by research grants (not to include fringe benefits costs) 31.09% (100 responses); 31.09% is the average salary support from the 75 departments reporting some salary from research grants. The minimum was .03% and the maximum 75%.

What is your current fringe benefit rate 22.76% (100 responses)

Space assigned to your department (excluding lecture rooms) (103 responses)

	Mean	Minimum	Maximum
Research	13,069	750	58,214
Teaching Lab	2,173	0	20,000
Office Space	3,497	360	10,899
Storage	756	0	15,627
Other	3,776	0	142,149
Total	23,271		

TABLE 4. **Complete Ranking According to Outside Research Dollars**

Rank	Grant Income	Grant Income/Faculty	Research Space (sq. ft.)	Research Space/Faculty	Space Rank	No. of Faculty
1	$6,273,160	$392,073	23,427	1,464	9	16
2	6,207,100	564,282	12,857	1,169	43	11
3	5,942,626	228,563	16,663	641	26	26
4	5,800,000	386,667	29,665	1,978	5	15
5	4,512,153	180,486	20,258	810	17	25
6	4,393,646	183,069	19,625	818	20	24
7	3,683,827	147,353	22,500	900	12	25
8	3,539,472	208,204	22,702	1,335	11	17
9	3,519,262	159,966	17,718	805	23	22
10	3,390,000	226,000	27,622	1,841	6	15

TABLE 4. **Complete Ranking According to Outside Research Dollars (Continued)**

Rank	Grant Income	Grant Income/Faculty	Research Space (sq. ft.)	Research Space/Faculty	Space Rank	No. of Faculty
11	3,238,893	231,350	9,751	697	60	14
12	3,128,624	107,884	13,101	452	41	29
13	3,026,494	189,156	14,000	875	37	16
14	3,012,326	120,493	25,495	1,020	8	25
15	2,989,226	119,569	36,000	1,440	3	25
16	2,291,000	153,737	12,234	644	46	19
17	2,836,601	236,383	10,400	867	55	12
18	2,760,869	115,036	22,168	924	13	24
19	2,746,432	152,580	11,230	624	51	18
20	2,500,000	357,143	50,000	7,143	2	7
21	2,440,300	152,519	16,096	1,006	29	16
22	2,399,567	126,293	12,338	649	45	19
23	2,366,246	147,890	20,483	1,280	15	16
24	2,363,746	98,489	30,847	1,285	4	24
25	2,227,271	185,606	9,601	800	63	12
26	2,157,362	239,707	6,872	764	79	9
27	2,099,295	110,489	12,445	655	44	19
28	2,055,916	128,495	17,217	1,076	25	16
29	2,023,053	74,928	14,892	552	33	27
30	2,000,000	100,000	13,000	650	42	20
31	1,997,572	79,903	10,017	401	57	25
32	1,997,000	181,545	11,980	1,089	49	11
33	1,888,957	94,448	18,385	919	22	20
34	1,875,454	170,496	6,599	600	84	11
35	1,866,000	88,857	58,214	2,772	1	21
36	1,856,786	80,730	14,252	620	36	23
37	1,813,535	181,354	20,440	2,044	16	10
38	1,800,000	180,000	12,092	1,209	47	10
39	1,700,000	113,333	16,000	1,067	30	15
40	1,697,498	130,577	17,261	1,328	24	13
41	1,611,287	94,782	23,318	1,372	10	17
42	1,555,238	97,202	13,736	858	38	16
43	1,541,898	77,095	18,988	949	21	20
44	1,527,124	63,630	19,846	827	18	24
45	1,500,000	78,947	9,928	523	59	19
46	1,413,862	235,644	4,992	832	89	6
47	1,404,222	73,906	14,800	779	34	19
48	1,386,233	92,416	7,265	484	76	15
49	1,371,648	124,695	15,755	1,432	31	11
50	1,349,032	74,946	14,515	806	35	18
51	1,240,185	112,744	10,000	909	58	11
52	1,215,135	55,233	6,821	310	81	22
53	1,197,532	85,538	19,764	1,412	19	14
54	1,151,509	82,251	27,564	1,969	7	14
55	1,149,096	114,910	7,200	720	77	10
56	1,148,512	127,612	9,000	1,000	67	9
57	1,143,000	87,923	11,000	846	52	13
58	1,125,367	80,383	9,500	679	65	14
59	1,094,585	84,199	11,741	903	50	13
60	1,090,200	68,138	13,367	835	40	16
61	1,049,607	131,201	9,210	1,151	66	8
62	992,299	70,879	13,700	979	39	14
63	988,800	141,257	12,000	1,714	48	7
64	976,457	88,769	10,810	983	53	11
65	953,000	95,300	15,000	1,500	32	10
66	940,128	42,733	16,585	754	28	22
67	900,000	75,000	16,630	1,386	27	12
68	895,375	59,692	8,700	580	69	15
69	850,000	121,429	9,500	1,357	64	7
70	808,467	62,190	9,652	742	61	13
71	799,390	61,492	5,880	452	86	13
72	775,360	129,227	7,500	1,250	74	6
73	730,000	66,364	7,796	709	73	11
74	707,827	54,448	6,831	525	80	13
75	680,000	61,818	4,200	382	90	11
76	625,978	56,907	8,608	783	70	11
77	623,641	41,576	9,628	642	62	15
78	542,000	54,200	6,700	670	83	10
79	487,366	69,624	5,600	800	87	7
80	457,819	22,891	8,854	443	68	20
81	430,826	47,870	3,604	400	94	9

TABLE 4. **Complete Ranking According to Outside Research Dollars (Continued)**

Rank	Grant Income	Grant Income/Faculty	Research Space (sq. ft.)	Research Space/Faculty	Space Rank	No. of Faculty
82	423,721	47,080	7,270	808	75	9
83	417,097	69,516	3,940	657	92	6
84	400,000	40,000	10,071	1,007	56	10
85	320,395	40,049	3,800	475	93	8
86	295,783	49,297	6,507	1,085	85	6
87	284,893	40,699	10,591	1,513	54	7
88	263,155	20,243	8,342	642	71	13
89	245,746	35,107	6,776	968	82	7
90	244,569	22,234	7,200	655	78	11
91	200,000	28,571	3,161	452	97	7
92	176,724	35,345	3,240	648	96	5
93	141,748	15,750	8,312	924	72	9
94	136,276	27,255	2,290	458	98	5
95	81,123	16,225	3,373	675	95	5
96	60,000	12,000	2,000	400	100	5
97	31,795	10,598	750	250	103	3
98	30,000	7,500	1,642	411	102	4
99	25,000	3,571	1,872	267	101	7
100	0	0	5,300	1,325	88	4
101	0	0	2,000	667	99	3
102		0	21,000	955	14	22
103		0	4,120	515	91	8

TABLE 5. **Pre- and Postdoctoral Trainees**

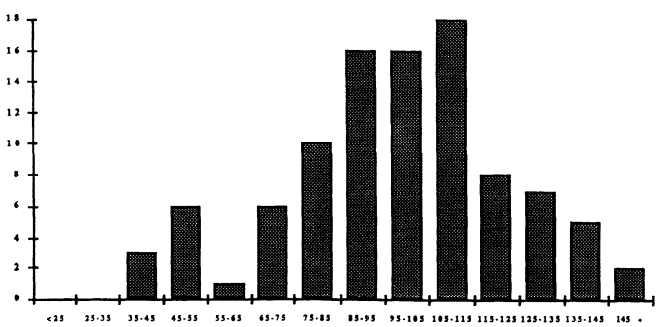
	Year								
	1989	1988	1987	1986	1985	1984	1983	1982	1981
PhDs granted	184	157	143	98	113	135	153	137	165
Degrees to minorities									
Female	74	62	38	32	40	42	32	40	41
Black	9	9	3	2	1	2	2	4	3
Others	20	11	15	1	7	7	8	9	12
Area of study (%)									
Cardiovascular	23	24	24	30	21	23	23	15	20
Cell/Tissue	13	7	10	15	16	16	14	16	4
Comparative			1	3	1	1	2	1	1
Endocrine	9	13	13	11	9	24	21	25	24
Environmental	1	1	2	1		4	2	2	1
Gastrointestinal	5	3	6	6		3	2	4	4
General	1	2	1		2	1	13	3	11
Molecular Biology	4	1							
Muscle/Exercise	7	7	4	5	10	3	4	4	4
Neural	17	14	21	20	24	15	13	19	18
Renal	1	7	8	3	7	4	3	7	7
Reproduction	8	10	6						
Respiratory	5	5	4	6	10	6	3	4	6
Special Senses	3	3							
Transport	3	3							
PhD students in program	1327	1299	1225	1002	1040	1329	991	1043	1036
Foreign	437(32.9)	371(28.5)							
Postdocs in program	783	764	637	497	524	534	534	475	493
Foreign	400(51.1)	388(44.2)							
Vacant postdoc positions	84	92	84	59	59	64	52	51	53
Postdocs finishing work	201	173	146	118	111	130	132	147	131
Faculty positions available	126	128	110	97	78	99	92	84	87
Stipends									
PhD students	$10,260	$9,389	$7,847	$7,530	$7,244	$6,600	$5,845	$5,609	
Postdocs (1st yr)	$19,373	$18,741	$19,783	$17,120	$16,890	$15,634	$14,689	$14,097	

TABLE 6. **Training Support**

	% total/yr					
	1989	1988	1987	1986	1985	1984
Postdoctoral						
Training grants	11	12	13	12	12	16
Individual federally funded awards	3	3	3	4	3	4
Research grants	30	29	30	26	24	22
State funds	22	24	26	31	30	25
Private foundations	3	2	4	4	4	3
Institute awards	17	20	15	14	19	20
Medical scientist training program	6	2	2	2	2	4
Other	8	7	7	7	5	7
Posdoctoral						
Training grants	13	14	18	18	18	22
Individual federally funded awards	10	11	10	19	15	22
Research grants	56	51	55	41	45	32
State funds	2	2	3	4	5	3
Private foundations	11	12	7	10	8	12
Institute awards	3	3	2	4	6	4
Medical scientist training programs	0	0	1	1	1	1
Other	5	7	5	3	3	4

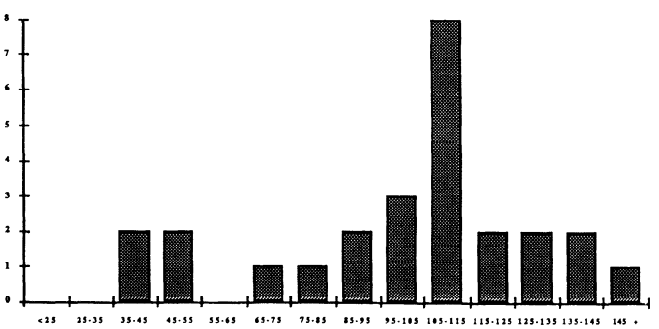
Chairmen

All School Chairmen
Mean 97,259



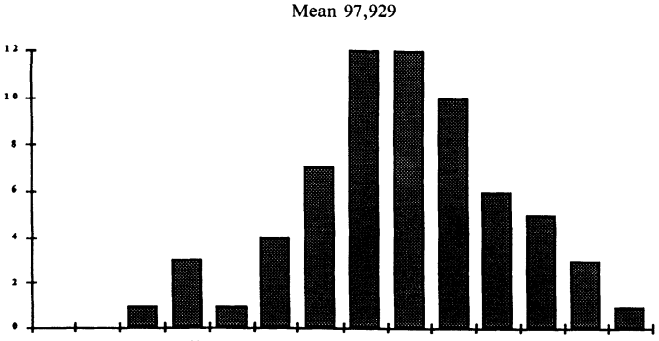
Salary in Thousands

Medical Private Chairmen
Mean 99,828



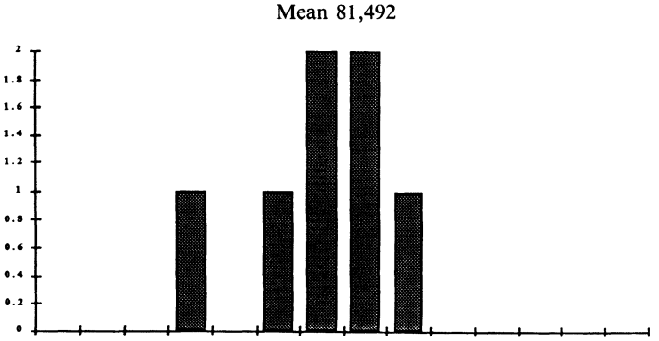
Salary in Thousands

Medical Public Chairmen
Mean 97,929



Salary in Thousands

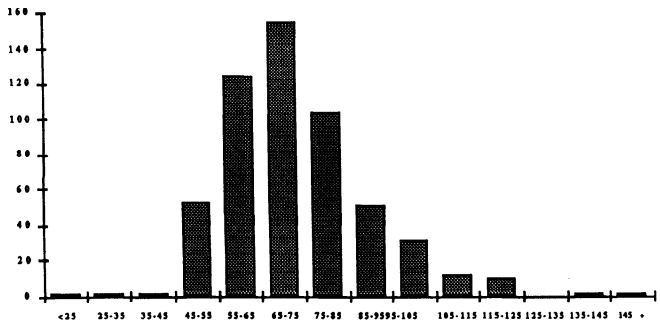
Nonmedical Chairmen
Mean 81,492



Salary in Thousands

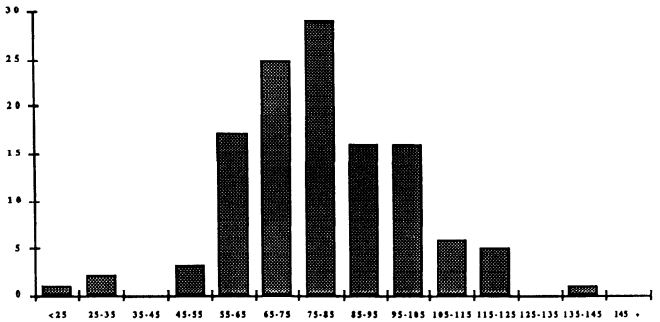
Professors

All Schools Professors
Mean 70,351



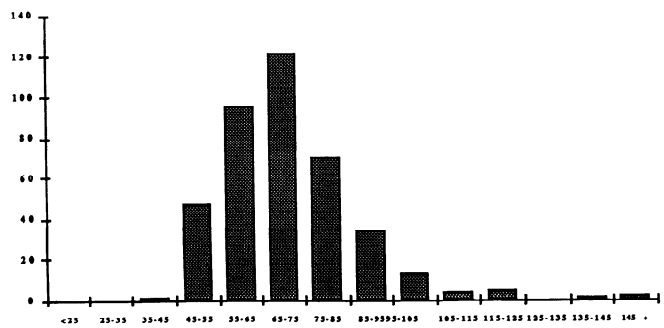
Salary in Thousands

Medical Private Professors
Mean 80,596



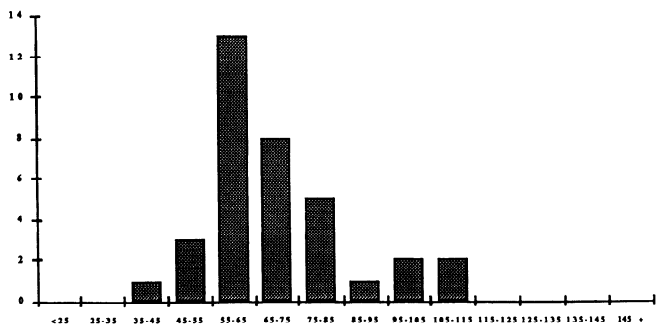
Salary in Thousands

Medical Public Professors
Mean 68,698



Salary in Thousands

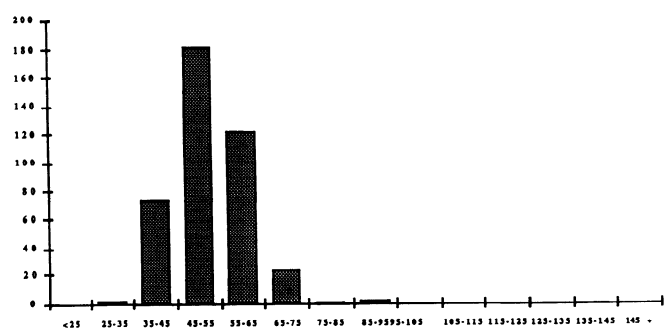
Nonmedical Professors
Mean 69,372



Salary in Thousands

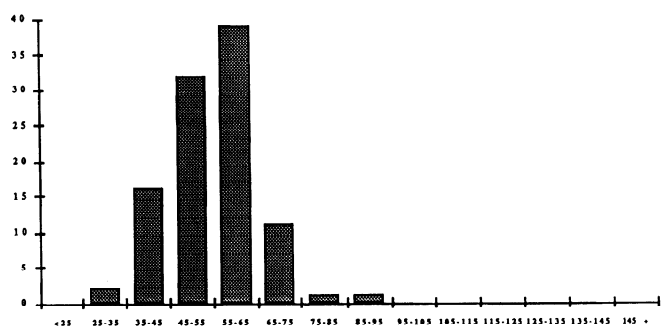
Associate Professors

All Schools Associate Professors
Mean 50,977



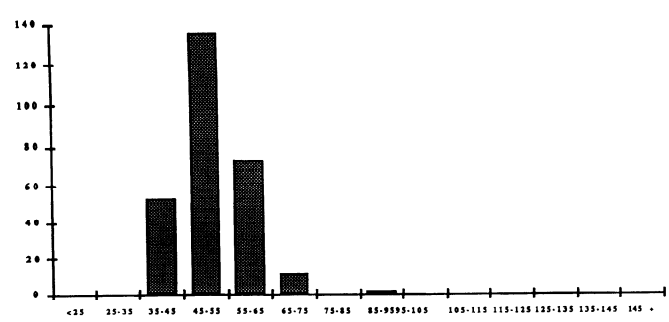
Salary to Thousands

Medical Private Associate Professors
Mean 54,892



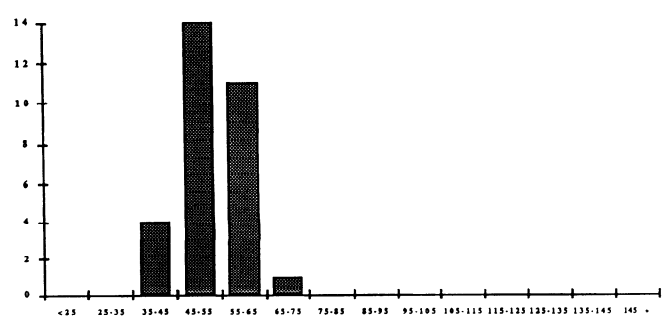
Salary to Thousands

Medical Public Associate Professors
Mean 51,900



Salary to Thousands

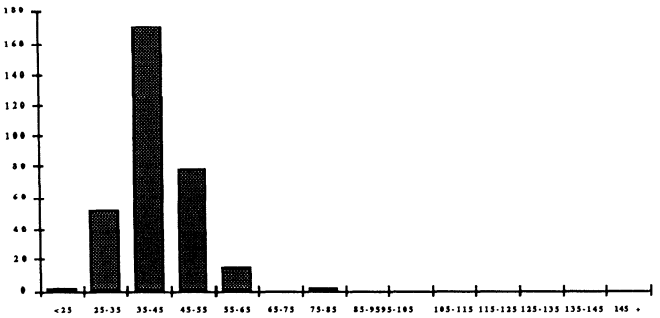
Nonmedical Associate Professors
Mean 52,614



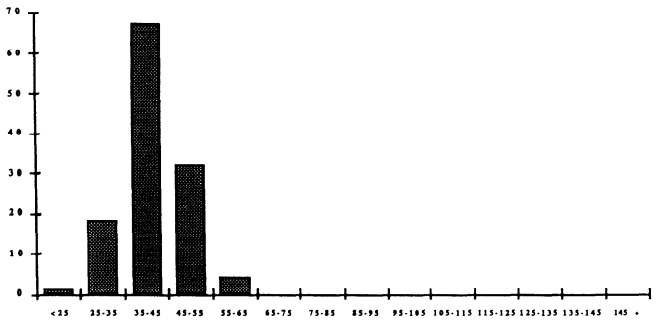
Salary to Thousands

Assistant Professors

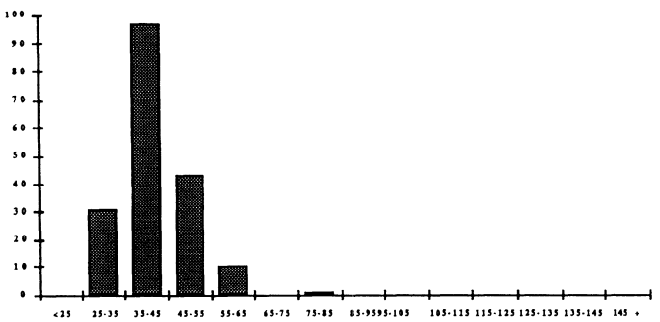
All Schools Assistant Professors
Mean 41,216



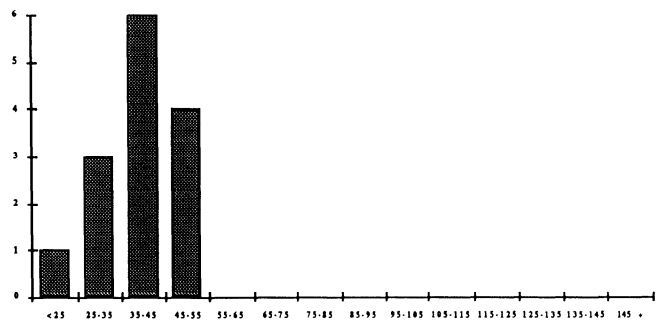
Medical Private Assistant Professors
Mean 41,973



Medical Public Assistant Professors
Mean 42,079

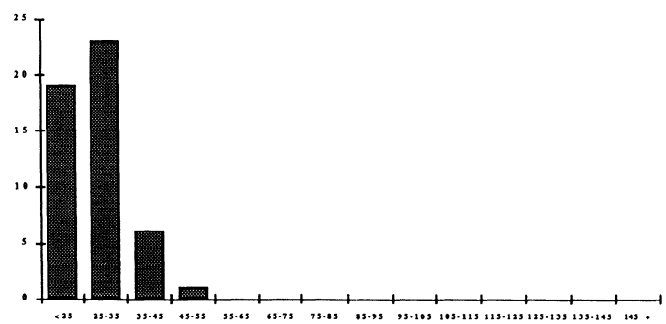


Nonmedical Assistant Professors
Mean 40,787

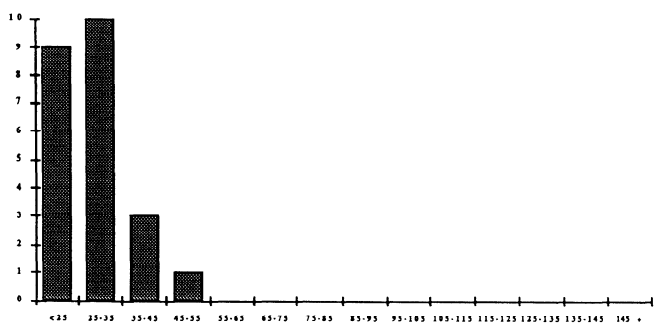


Instructors

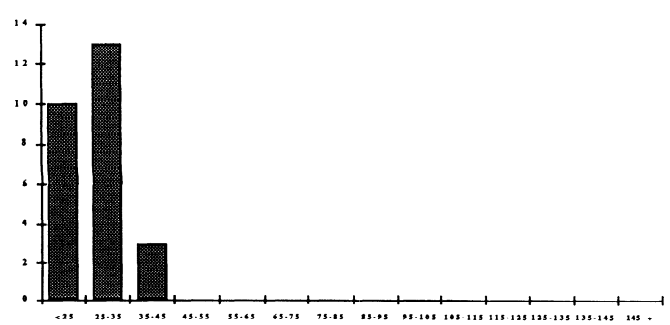
All Schools Instructors
Mean 28,344



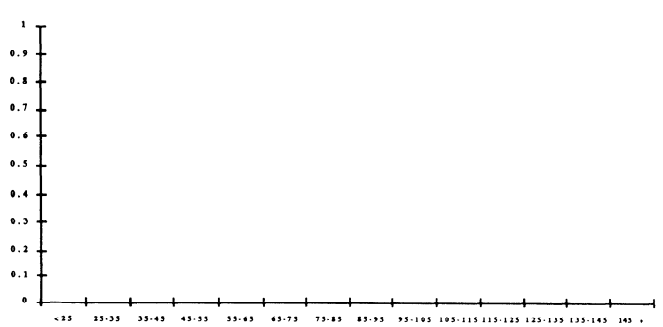
Medical Private Instructors
Mean 28,198



Medical Public Instructors
Mean 28,474



Nonmedical Instructors
Mean 0



Narahashi Receives Burdick & Jackson International Award for Research in Pesticide Chemistry

Toshio Narahashi, Chairman, Department of Pharmacology, Northwestern University Medical School, Chicago, IL, is the recipient of the 1989 Burdick and Jackson International Award for Research in Pesticide Chemistry. The award will be presented annually by the Division of Agrochemicals of the American Chemical Society (ACS) to an individual who has made substantial contributions to the field of pesticide science, including the chemistry and mode of action of pesticides. Narahashi, whose award was based on a series of electrophysiological studies of the mechanisms of action of enuroactive insecticides on the nerve membrane ion channels, will be honored at an award symposium at the fall ACS national meeting in Washington, DC, August 27, 1990.

Michael J. Barber, MD, PhD, a fellow at Duke University Medical Center, has moved to the University of Virginia Health Science Center, Division of Cardiology.

APS member, **Thomas McCalden,** PhD, has accepted a position at the University of Nevada, Reno. McCalden was at Liposome Technology Inc., Menlo Park, CA.

Franz Halberg, MD, Chronobiology Laboratories, University of Minnesota, Minneapolis, was elected to the French National Academy of Medicine on March 6, 1990. Beyond introducing the terms "circadian" and "chronobiology," Franz Halberg is regarded by many as the father of a new branch of science concerned with variations within the physiologic range. Halberg has been a member of the Society since 1955.

APS Membership Applications

Membership applications may be obtained from APS Membership Services, 9650 Rockville Pike, Bethesda, MD 20814. Applications received between February 1 and July 1 are considered for nomination by Council at the Fall Meeting, and those received between July 1 and February 1 are considered for nomination at the Spring Meeting of the Society.

People and Places notices come almost exclusively from information provided by members and interested institutions. To ensure timely publication, announcements must be received at least *three months* (by the 5th of the month) before the desired publication date. Send all information to Martin Frank, Editor, *The Physiologist,* APS, 9650 Rockville Pike, Bethesda, MD 20814.

EDITORIAL
(Continued from p. 50)

vate institutions. At Stanford the conflict became so intense, it erupted onto the pages of *Science* (April 20, 1990). Stanford's faculty revolted against its "predatory" rate of 74%. The faculty concern was that the university was making it more difficult for its own investigators to get funded "by skimming a high rate of overhead off grants."

With rising indirect cost rates and shrinking research budgets, the scientific community is facing what might be a never ending nightmare. Regrettably, the nightmare might get worse if the AAU succeeds in its efforts to revise procedures for allocating indirect costs. In its effort to simplify procedures, the AAU Ad Hoc Committee on Indirect Costs has proposed some indirect costs be charged directly to grants. In addition, the committee has recommended that "buildings should be amortized over a 20-year life instead of the present 50-year life," a simplification that could cost over $300 million.

Unless we take action soon, the press release might come true. The APS and the other scientific societies must take the message to Congress. It also is the responsibility of our members to share their nightmares with their elected representatives. Tell them of your funding difficulties and the impact of over regulation. In so doing, we will be able to keep the American Scientist off the Endangered Species List.

Martin Frank

Research Scientist, anatomy/physiology. The Department of Rehabilitation Medicine, Jefferson Medical College, Thomas Jefferson University seeks a PhD level anatomist/physiologist with an interest in spinal cord injury to direct the animal laboratory in an existing federally funded spinal cord injury center, devoted to the investigation of neural recovery and functional enhancement. The individual hired will perform research in peripheral nerve sprouting as it relates to partial denervation caused by damage to the spinal cord or nerve roots. Other responsibilities will include occasionally teaching medical residents, students, and allied health professionals.

To apply, send curriculum vitae and the names and phone numbers of three references to: G. J. Herbison, MD, 1015 Walnut Street, Room 617 Curtis Building, Jefferson Medical College, Thomas Jefferson University, Philadelphia, PA 19107. An Equal Opportunity Employer.

Physiologist needed for postgraduate training in obstetrics and gynecology in Ghana. A Carnegie-supported project sponsored by the American College of Obstetricians and Gynecologists and the Royal College of Obstetricians and Gynecologists is training physicians in Ghana. The project needs at least one physiologist capable of teaching a broad array of topics to these physicians in Ghana. The physiologist would be expected to remain in Ghana for several weeks at a time. All expenses would be covered. If interested, please contact Thomas E. Elkins, MD, Chief, Gynecology Division, University of Michigan Medical School, Medical Professional Building D2202-0718, 1500 E. Medical Center Drive, Ann Arbor, MI 48109-0718.

NIH/National Institute on Aging (NIA): Research Program Director. The NIA seeks two extramural research program directors: one for musculoskeletal/physical performance/rehabilitation research, the other for cardiovascular research. Activities include developing and implementing new research grant initiatives, and administrative oversight of applications and grants. Doctoral degree or its equivalent and research experience required. Individuals may be hired through the Civil Service or the Public Health Service Commissioned Corps, at salaries commensurate with qualificatons and experience. Call Dr. Evan Hadley at (301) 496-6761 concerning scientific and administrative aspects of these positions. To apply, an application for Federal employment (SF-171) accompanied by current CV must be sent to Ms. Ann Baldwin, 9000 Rockville Pike, Building 31, Rm. 2C11, Bethesda, MD 20892, by July 15, 1990. Call Ms. Baldwin at (301) 496-5347 concerning application procedures, salaries, and benefits. US Citizenship is required. NIH is an equal opportunity employer.

Positions Available

There is a $25 charge per issue for each position listed. A check or money order payable to the American Physiological Society must accompany the copy. Purchase orders will not be accepted unless accompanied by payment. Ads not prepaid will not be printed. Copy must be typed double-spaced and limited to 150 words. All copy is subject to the editorial policy of *The Physiologist.* EOAAE indicates Equal Opportunity/Affirmative Action Employer and appears only where given on original copy. Copy deadline: copy must reach the APS office before the 15th of the month, 2 months preceding the month of issue (e.g., before February 15 for the April issue). Mail copy to APS, 9650 Rockville Pike, Bethesda, MD 20814.

Director, Use of Alternatives in Animal Research, Teaching and Testing Program, University of California School of Veterinary Medicine. The Director will hold a joint administrative and academic appointment in a suitable academic department as a faculty member of the University and report to the Dean of the School of Veterinary Medicine.

The Director will lead the development and the management of the University of California program on the use of alternatives in animal research, teaching and testing. Specific responsibilities will include strategically planning for the development of the program, including campus wide affiliations and the initiation and coordination of systemwide activities; administering the program and resources of the program; establishing a database for animal alternatives and a library of alternative materials; developing procedures and guidelines for seed grants and administration of a granting program; obtaining extramural funding for the purposes of the program; and planning and presenting conferences, symposia and workshops on the range of topics related to alternatives. Applicants should have a background of successful administrative leadership and achievement in scientific research in an appropriate field; demonstrated interest and commitment to the goals and objectives of the Animal Alternatives Program; working knowledge of information systems; an ability to deal effectively with diverse groups; an ability and commitment to negotiate and secure funding for programmatic research and development; and commitment to the affirmative action goals of the campus.

Applicants should submit a curriculum vitae and names of three references to Dean Edward A. Rhode, School of Veterinary Medicine, University of California, Davis, CA 95616. Applications will be accepted through July 16, 1990 or until a suitable candidate is identified. The University of California is an Equal Opportunity/Affirmative Action Employer.

Computerized Editing

The *American Journal of Physiology* and *Journal of Applied Physiology* are now encouraging the submission of disks of accepted manuscripts for computerized editing. The following criteria must be met: 5¼-inch, low-density disks preferably using WordPerfect (or other DOS-formatted software) done on an IBM-PC or compatible. Once accepted, please forward your disk containing the entire manuscript (title page, text, references, figure legends) with the following information: computer; software package and version; name of file; manuscript title, author(s), and reference number. For further information, contact Krysia Moore at APS (301/530-7169).

Scientific Meetings and Congresses

Glial Neuronal Interaction International Conference, University of Cambridge, England, September 4-7, 1990. *Information:* Conference Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY, 10021. Tel: 212-838-0230, Fax: 212-888-2894.

VIth International Conference on The Sodium Pump Symposium, Woods Symposium, Society General Physiologists, Woods Hole, MA, September 5-9, 1990. *Information:* Society of General Physiologists, PO Box 257, Woods Hole, MA 02543.

Regulation of Smooth Muscle: Progress in Solving the Puzzle 6th Annual Hospital Research Symposium, The Graduate Hospital, Philadelphia, PA, September 14-16, 1990. *Information:* Robert S. Moreland, Bockus Research Institute, Graduate Hospital, 415 South 19th Street, Philadelphia, PA 19146. Tel: 215-893-2378.

Advances in the Understanding and Treatment of Asthma Conference, Royal College of Surgeons, London, England, October 1-3, 1990. *Information:* Conference Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021. Tel: 212-838-0230, Fax: 212-888-2894.

Calcium Entry and Action at the Presynaptic Nerve Terminal Conference, Baltimore, Maryland, October 15-17, 1990. *Information:* Conference Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021. Tel: 212-838-0230, Fax: 212-888-2894.

International Conference on Modulation of Respiratory Pattern: Peripheral and Central Mechanisms, Lexington, KY, October 25-27, 1990. *Information:* Donald T. Frazier, PhD, Chairman, Department of Physiology and Biophysics, University of Kentucky, Lexington, KY 40536-0084.

American Society for Cell Biology 30th Annual Meeting, San Diego, CA, December 9-13, 1990. *Information:* ASCB National Office, 9650 Rockville Pike, Bethesda, MD 20814. Tel: 301-530-7153, Fax: 301-530-7139.

2nd International Symposium on Growth Factors/Somatomedins, San Francisco, CA, January 12-16, 1991. *Information:* Secretariat, Extended Programs in Medical Education, Room C-124, University of California School of Medicine, San Francisco, CA 94143-0742. (Tel: 415/476-5808, Fax: 415/476-0318).

Third International Symposium on Excitation-Contraction Coupling in Skeletal, Cardiac, and Smooth Muscle, Banff Center, Banff, Alberta, Canada, June 26-30, 1991. *Information:* George B. Frank, Room 9-70 Medical Sciences Building, University of Alberta, Edmonton, Alberta, Canada, T6G 2H7.

Fifth World Congress for Microcirculation, hosted by the Microcirculatory Society, Louisville, KY, August 31-September 5, 1991. *Information:* Patrick D. Harris, PhD, Department of Physiology and Biophysics, University of Louisville, KY, 40292. (Tel: 502/588-5373, Fax: 502-588-6239).

Fourth International Reinhardsbrunn Symposium on Circumventricular Organs, "Circumventricular Organs and Brain Fluid Environment: Molecular and Functional Aspects," German Democratic Republic, March 24-29, 1991. *Information:* Professor A. Ermisch, Section of Biosciences, Karl Marx University Leipzig, Talstr. 33, DDR - 7010 Leipzig, German Democratic Republic.

Future Meetings

1990	
APS Fall Meeting	October 6–10, Orlando, FL
1991	
FASEB Annual Meeting	April 21–25, Atlanta, GA
APS Fall Meeting	September 29–October 3, San Antonio, TX
1992	
FASEB Annual Meeting	April 5–10, Anaheim, CA
1993	
FASEB Annual Meeting	March 28–April 1, New Orleans, LA
1994	
FASEB Annual Meeting	April 24–29, Anaheim, CA
1995	
FASEB Annual Meeting	April 9–14, Atlanta, GA

Foundation Professor Pierre Rijlant Prize

Thanks to a legacy left to the Académie royale de Médecine de Belgique by the famous physiologist, Professor Pierre Rijlant, a triennial prize of 500,000 Belgian francs (approximately $12,500) will be granted to the author(s) making a major contribution in the field of cardiac electrophysiology regarding the following themes: hybrid computers in electrocardiography; application of computers to electrocardiography, and vectography and analog simulation.

The 1989 prize was awarded to an international team for their work on the electrophysiology of the heart and, more particularly, their study of body surface potential maps.

The next prize will be delivered in 1991. Candidates are invited to submit in triplicate their curriculum vitae, work designed for the prize, a summary of their scientific production, and the list of their previous awards before December 31, 1990. In the case of a previously awarded distinction greater than the amount of the present prize obtained within the last three years, they will not be selected. The work has to be written in French, Dutch, English, and German.

Information: Dr. Marc Renard, Secretary of the Foundation, Académie royale de Médecine de belgique, Palais des Académies, Rue Ducale 1 - B-1000 Brussels (Belgium).

Foundation Professeur Lucien Dautrebande Prize

The 1988 triennal prize of the Foundation Professeur Lucien Dautrebande has been awarded to Professor T. Godfraind for his pioneer work on calcium antagonists. The 1988 Young Investigator's Award went to Dr. J. C. Henquin for his work on the control of insulin secretion. Both laureates are associated with the Faculty of Medicine of the Catholic University of Louvain in Brussels. The presentation took place in Brussels on December 13, 1988 in the presence of Her Majesty the Queen. The prizewinner received a 2,000,000 BEF (about $55,000) honorarium and the young investigator a 1,000,000 BEF.

The awards of the Foundation Professeur Lucien Dautrebande approximate 4,000,000 BEF and will be granted again in 1991 for work on human or animal clinical physiopathology, such work preferably having therapeutic implications. *Information:* Foundation Professeur Lucien Dautrebande, Dr. Stalport, "Maison Batta," Avenue Batta n°3, à 5200 HUY (BELGIUM), before December 3, 1990.

APS Sustaining Associate Members

The Society gratefully acknowledges the contributions received from Sustaining Associate Members in support of the Society's goals and objectives

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CPS/APS Joint Meeting
November 2-5, 1990

The Chinese Physiological Society in Taiwan, ROC, has invited members of the American Physiological Society to participate in a joint meeting in Taipei, Taiwan. The first joint meeting of the two societies will be held at the Institute of Biomedical Sciences, Academia Sinica in Taipei. The meeting will include six symposia, a workshop on Sino-American collaboration in research and training, and free communications related to all areas of physiological research. **The Deadline for receipt of abstracts is August 1, 1990.**

The symposia for the joint meeting will feature speakers from both the CPS and APS. The symposia scheduled for the meeting include:

Neural Control of the Circulation
Structure and Function of Blood Vessels
Cellular and Molecular Endocrinology
Renal Tubular Transport
Signal Transduction and Neuronal Function
Homeostatic Regulation in Exercise

The deadline for advance registration is August 1, 1990. The Registration fee of $100 for members and $120 for non-members includes the welcome reception, banquet, box lunches, abstract and program book, and transportation between the hotel and meeting site.

Individuals wishing to receive a Call for Papers should contact: Dr. Martin Frank, CPS-APS Joint Meeting, APS, 9650 Rockville Pike, Bethesda, MD 20814, 301/530-7164

Call for Nominations
Excellence in Science Lecture and Award

The Women's Committee of the APS is seeking nominations of women physiologists for the FASEB Excellence in Science Lecture and Award. Nominees should be women who have ongoing research programs and whose research has contributed significantly to further our understanding of physiological mechanisms. Nominations may be made by APS or FASEB Society members only. Nominations should be made in the form of a letter of nomination that describes: *1*) the contribution(s) to the field, *2*) as many as five publications representative of the nominee's work, *3*) leadership and mentor roles, *4*) evidence of national recognition, and *5*) honors and awards. The letter should be accompanied by a current curriculum vitae of the nominee. Additional letters of support are encouraged. The awardee will present an Excellence in Science Lecture at the FASEB Annual Meeting in Atlanta, Georgia. Travel expenses to the FASEB Meeting, complimentary registration for the meeting, and a plaque in recognition of the award will be paid by FASEB.

Send nominating letters and materials by October 1, 1990 to: The Women's Committee of FASEB, c/o Ms. Margaret C. Averi, FASEB Executive Office, 9650 Rockville Pike, Bethesda, Maryland 20814.

Correction

Leo C. Senay, Jr., former APS representative, is with the St. Louis University, School of Medicine. Robert L. DeHaan of Emory University is the current representative to the AAAS Medical Science, Section N [*The Physiologist, 33(2): 39, 1990*].