THE PHYSIOLOGIST

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Association of Chairmen of Departments of Physiology Annual Questionnaire Results

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Chairpersons of physiology departments were asked to complete a questionnaire regarding various aspects of departmental operation. Questionnaires were mailed to 187 departments (151 member departments and 36 nonmember departments) that had been identified in *Peterson's Guide to Graduate Programs in the Biological and Agricultural Sciences.* One hundred thirteen (113) responses were received, 111 from member departments and 2 from nonmember departments. The majority of the responses were from the United States, a few from Canada, two from Puerto Rico, and one from Mexico. As in 1989-90, we were disappointed not to receive a higher percentage of returns. Surely, all parties agree that the information provided in this survey attests to the vitality of physiology in North America.

Considerable effort was devoted to revising the 1990 questionnaire. The final draft was sent for evaluation to administrators in the departments of the eight Executive Council members and in four other departments selected for their size and diversity of operation. Instructions for completion of the questionnaire were developed that included examples, definitions, and a numeric checklist. In spite of this considerable effort, problems arose in those instances where information pertaining to an identified group of faculty and/or trainees was requested in subsequent sections of the questionnaire. The quantitative and qualitative profiles of these groups were quite "plastic." For the most part, we did not include in our calculations information that was ambiguous, unidentifiable, or incomplete. Clearly, we need to refine the questionnaire and make it totally self-explanatory or develop instructions adequate for everyone.

We are particularly pleased by the information obtained in the faculty subdisciplines section and with regard to ethnicity of pre- and postdoctoral trainees and faculty. We believe this information will be of value to everyone reading this report; however, our effort to provide expanded information regarding faculty appointments met with mixed success. Our primary difficulty remains that of where to count faculty in the numerous categories shown. An example is lack of appropriate designations for joint faculty, particularly those persons located in unaffiliated institutions or those who volunteer. Additionally, categories to accommodate our colleagues in the physical sciences and engineering were not provided. Substantial effort needs to be devoted to refining the design of this section for the 1991-92 survey.

Another substantial change made in the questionnaire relates to the way salary information was requested. In times past, we have asked for annualized salaries, i.e., converting a 9- or 10-month base salary to a 12-month salary. We found that the information provided often did not represent total

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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. Fax: 301-571-1814.

As a Matter of Opinion

On The Road

The first APS meeting I attended was in Chicago in April 1957. Several of us drove from Philadelphia, stopping overnight near Detroit. I don't remember much about the meeting, but I shall never forget the trip: the Pennsylvania Turnpike, old US 30 (the Lincoln Highway), the Ohio Turnpike, and the Indiana Toll Road. It was my first trip to the Midwest. A year later I drove across the country to live in California.

Thirty years later, after umpteen boring flights from San Francisco to sterile airports all over the country, I decided to start driving to at least one meeting each year. By taking different routes I see sights unmatched anywhere. Not only is it thrilling to see America at ground level instead of seven miles up and through layers of clouds but it is surprisingly relaxing and often cheaper than flying, even including gasoline and three or four days of meals and motels each way. In addition, I have transportation in the meeting city, so I don't have to stay at the expensive downtown hotels.

A major benefit of the slower road trip is that I am out of contact with all the petty nonsense associated with academic life. Even when I think I'm so busy I can't take the time, I find that taking the time somehow helps. All that busywork I thought was so important is not. My grants don't disappear, the university survives, everything important gets done, and I am refreshed. I have time to think about my research, solve nagging problems, get new ideas for experiments, and compose papers in my head.

Freeways are useful for making 600–700 miles a day, allowing me time to take side roads and see intriguing places. Highway 50 south of Salt Lake City, Utah, to near Reno, Nevada, has one stretch of 110 miles without a red light, a filling station, or traffic. It is an exhilarating ride through some starkly beautiful desert. Only remnants of US Route 66 from Chicago to Los Angeles remain, but you can still get some kicks on it. Although Interstate 80 is a great road, on my next trip east, I intend to follow the Lincoln Highway part of the way. Established in 1913, it was America's first cross-country highway.

Among the places I've visited are the Indian mounds near East St. Louis, Illinois; Meteor Crater, Arizona; Lincoln's birthplace near Hodgenville, Kentucky; the atomic energy museum at Oak Ridge, Tennessee; Carl Sandberg's birthplace in Galesburg, Illinois; and Elvis Presley's home in Memphis. Once I drove 30 miles out of my way just to have breakfast at The Virginian Hotel in Medicine Bow, Wyoming.

Good cheap motels are everywhere. When I made my first trip, I naively assumed that only truck drivers stopped at such places, but I soon found out how wrong I was. As often as not, it's Cadillacs and Mercedes filling the parking spaces. Although I carry the catalogs of the main national motel chains so I can make reservations in advance, I prefer to wait until evening and then pick a place wherever I happen to be. Once I arrived in Flagstaff,

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ORR E. REYNOLDS . . . *An Appreciation*

"He was one of a kind" . . . "A man for all reasons" . . . "A relentless champion of basic research."

These were typical of the comments made by members and nonmembers alike who called and wrote to APS upon learning of the death of Orr Reynolds.

Many callers also noted that if it were not for Orr Reynolds they would not have their doctorate degrees for it was Orr who not only encouraged them but who also opened necessary doors for their academic advancement.

Reynolds, who was the Society's third executive secretary-treasurer, died March 30 in Ft. Lauderdale, FL, where he had made his home since last July. He was 71.

Orr Esrey Reynolds was a man born into a world of science and education, his father having been both a university chemistry professor and a research chemist. Reynold's interests, however, turned from chemistry to the biological sciences when as a college sophomore he started working summers at the Chesapeake Biological Laboratory in southern Maryland, a summertime job he continued through most of graduate school.

Reynolds was a native of Baltimore, but he grew up in the District of Columbia. He earned his baccalaureate, masters, and doctorate degrees from the University of Maryland.

Reynolds began his scientific career as a physiologist at the National Institutes of Health, leaving in 1943 to serve with the Navy during World War II, first as a physiological test officer and later an aviation physiology research administrator in the Navy Bureau of Medicine and Surgery. After the war he was named director of the Biological Sciences Division of the Office of Naval Research.

In 1957 Reynolds was appointed director of the Office of Science, a Secretary-level position in the Department of Defense. His assignment was to supervise the Navy's Vanguard Program, which was the nation's first efforts to launch an object in space.

Vanguard's failures and the Soviet success with Sputnik brought to Reynolds' office from President Eisenhower the question: What should the United States do? Reynolds prepared the draft response for the President, stating that the challenge of space should be confronted by an agency with a primary basic science orientation. The creating of the National Aeronautics and Space Administration was the result.

In 1962 Reynolds transferred to NASA to become the space agency's director of bioscience programs. There he supervised research on the fundamental nature of life and the way primitive life forms develop and explored the environmental requirements for life away from earth.

His major achievement at NASA, however, was as the innovator of the Biosatellite Program, which was the first unmanned life-sciences spaceflight tailored to the needs of

biological experiments, as distinct from observation. It was these orbital laboratories that led to further space experiments, including the Soviet's Cosmos program in which the United States was a participant.

It was largely through Reynolds' efforts while at NASA that the White Mountain Research Station was developed in California for the purposes of conducting high altitude research. That facility continues to conduct research at altitude stations located at 10,000, 12,500, and 14,250 feet.

Reynolds came to the American Physiological Society as the education officer in 1970, the same year he retired from NASA. Three years later he was selected to replace Ray Daggs as the Society's executive officer, a position he held until 1985.

"Orr's tenure as executive secretary-treasurer came at the time when APS was undergoing many significant changes, including greater membership involvement in Society affairs," said APS president Norman Staub. "And he was the right person for that particular era in the Society's history."

Among the changes within the Society's structure during Reynolds' tenure was the use of mail ballots to elect officers and Council members, the sectionalization of members into areas of scientific interest, the establishment of membership categories for both foreign and student members, the opportunity for women and minorities to have a voice in the Society, the creation of program advisory committees with representation for all sections, and a threefold growth in the number of pages published in APS journals and periodicals.

Reynolds, who was a 43-year member of APS, held the

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ORR E. REYNOLDS

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unique distinction of having known 55 of the 65 APS presidential officers and all of the Society's executive officers.

Although Reynolds officially retired in 1985, he continued for two years to work for APS as a fulltime, unpaid volunteer staff person in order to prepare for the Society's participation in the International Union of Physiological Sciences Congress in 1986 and the Centennial Year celebration in 1987. Serving as an unpaid volunteer was not unusual for Reynolds, who believed working for APS was a labor of love.

At the time of his death Reynolds was a director of the IUPS Commission on Gravitational Physiology, a position he had held since 1980. He also had served since 1979 as editor of the proceeding for the Commission's annual meetings.

The Society honored Reynolds after his retirement by establishing the Orr E. Reynolds Award, which is a $500 cash prize presented annually at the Society's spring meeting to the APS member submitting the best article on the history of physiology.

An Orr E. Reynolds Memorial Education Fund also has been established by the Society. Contributions may be sent to the APS National Office, 9650 Rockville Pike, Bethesda, MD 20814-3991.

W. M. Samuels

ON THE ROAD

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Arizona, quite late and found every room taken (it's the main tourist town near the south entrance to the Grand Canyon), so I drove on another 50 miles, ending up in the funkiest and likely oldest motel in the US—only twenty bucks. Across the back lot, beyond a huge satellite TV dish, I found an excellent truck stop restaurant. Eat your heart out Sky Host!

I get up at 5:30 and am on the road before 6:00, sipping a cup of steaming coffee, which many motels give free. It is the best time for driving: quiet, not crowded. I've enjoyed sunrises over mountains and misty valleys. Once in western Kansas, I drove through violent thunderstorms with boiling black clouds, fearsome lightning, and the radio blaring tornado warnings all around. Overall, however, I'm amazed at how little bad weather I've encountered.

After driving for a couple of hours, I stop for a big breakfast. Then it's back on the road. I don't eat lunch, although I do take breaks at roadside rests and have lots of interesting junk food with me. When I stop for the night, I can always find a restaurant close by.

Dining across American is an experience. Not only is it incredibly cheap but regional variations abound: a salad bar in North Platte, Nebraska, is nothing like one in San Francisco. If you eat where the truckers eat, you can't go wrong. But it's also fun to choose a place at random or on a hunch. The best tasting, best cooked, most tender, and enormous steak I have ever had was at a small restaurant next to a motel in western Texas. There is no comparison between the official APS banquet food for which I pay $30 and the terrific meals I can get in small restaurants all across America for $10-15.

The main danger in long-distance driving is in not paying attention to the road, especially with the cruise control turned on. To keep myself alert, I listen to the radio stations of nearby cities: fantastic programs we don't get at home, such as the early morning farm news (prices of steers or ads for antihelminths), evangelists (always asking for money or selling something), country and western or rock music (how come all the powerful stations are devoted to these?). I always take along several *Books on Tape,* without which the day would be decidedly longer. I read four to six books each trip: once I read *Nicholas Nickleby,* which took 37 hours over 4 days. I never would have read it at home.

I'm thinking of getting an RV.

Next time you are frantically hurrying to the airport, ask yourself, wouldn't I rather be driving?

Norman Staub

13th Annual Meeting IUPS Commission on Gravitational Physiology

September 29-October 3, 1991
San Antonio, Texas
Marriott Rivercenter Hotel

Mathematical Modelling in Gravitational Physiology

Chair: R. D. Latham. *Participants:* J. Karemaker, S. Srinivasan, X. J. R. Avula, B. B. Tabarrok, S. Samn, U. Dinnar, B. Shykoff, and T. Moore.

Gravitational Cell Physiology

Chair: A. Cogoli. *Participants:* H. Bjurstedt, M. Tairbekov, L. Schaffer, M. P. Staves, S. W. de Laat, R. Hammerbach-Krause, R. Hampp, A. Sato, D. Morrison, and A. Cogoli.

Physiology of High-G Loadings

Chair: R. R. Burton. *Participants:* J. W. Burns, E. L. Besch, L. P. Krock, P. M. Werchan, J. E. Whinnery, T. R. Morgan, F. J. R. Buick, and R. R. Burton.

Current Concepts in Gravitational Physiology

Chair: N. Pace. *Participants:* T. A. Jones, E. Morey-Holton, T. A. McMahon, A. R. Hargens, C. L. Huntoon, L. Macho, and X. J. Musacchia.

(Held in Conjunction With The APS Conference)

APS Conference

Interactions of the Endocrine and Cardiovascular Systems in Health and Disease

September 29–October 3, 1991
San Antonio, Texas
Marriott Rivercenter Hotel

Neurotransmitter Release in Brain Nuclei Controlling Cardiovascular and Pituitary Function

Chair: S. L. Bealer. *Participants:* T. C. Westfall, N. Alexander, D. S. Gann, S. L. Bealer, and C. R. Freed

Systemic blood pressure is maintained by integrated responses in a number of central nervous system (CNS) sites that are known to regulate activity in the sympathetic nervous system and release of pituitary hormones such as adrenocorticotrophic hormone and vasopressin. However, the CNS neurotransmitter systems involved in pituitary function and cardiovascular regulation are not completely understood. To address this question, techniques have been employed to continuously monitor extracellular neurotransmitter concentrations in specific CNS regions. The purpose of this symposium is to present recent findings related to neurotransmitter release in specific brain sites involved in neural and endocrine responses to changes in blood pressure. These studies measured catecholaminergic activity, norepinephrine, histamine, and epinephrine release in hypothalamic and hindbrain sites that control endocrine and cardiovascular function. Furthermore, these experiments evaluated the role of osmoreceptors and baroreceptors in initiating neurotransmitter release and measured responses in rats with spontaneous hypertension and diabetes mellitus.

Calciotropic Hormones and Cardiovascular Function

Chair: M. F. Crass III and L. V. Avioli. *Participants:* R. U. Simpson, R. D. Bukoski, M. F. Crass III, G. A. Nickols, and L. V. Avioli

Parathyroid hormone (PTH) and 1,25-dihydroxyvitamin D_3 act via "classical" target sites on bone, kidney and gut to maintain extracellular calcium concentrations, ensuring normal calcium homeostasis and cell function. Pathophysiologically, alterations in circulating levels of PTH and 1,25-dihydroxyvitamin D_3 have been implicated in abnormal cardiovascular function, most specifically, in low renin hypertensive syndromes. Direct actions of these hormones on heart and blood vessels occur independent of associated changes in plasma calcium values, indicating the presence of "nonclassical" target sites for both hormones. The recently characterized PTH-related peptides (PTHrP) display calcemic, cardioactive, and vasoactive properties similar to those of PTH. In this regard, direct and indirect cardiovascular effects of cGRP and calcitonin must also be considered. Current knowledge concerning these hormone/peptide-receptor interactions, modes of signal transduction, and effects on cellular calcium fluxes will be reviewed. Areas for and approaches to future preclinical and clinical investigation will be identified.

Vascular Specializations in Endocrine Organs

Chair: G. A. Hedge and R. J. Traystman. *Participants:* J. D. Fenstermacher, M. J. Breslow, C. Desjardins, M. Michalkiewicz, and E. Samols

As interest in the regulation of blood flow to endocrine organs has been increasing, it has become apparent that the vascular beds of many endocrine organs have some unique features. This symposium will focus on the vascular specializations in five different endocrine organs, including adrenal, thyroid, testes, pancreas, and the hypothalamopituitary unit. In some cases, these specializations are structural adaptations and in others they are functional, but they all subserve the unique roles of the various organs. All presentations will be made by investigators who are active in the field, and several of these individuals are in developmental stages of their careers. It is expected that in addition to providing factual updates in this rapidly advancing field, this symposium will provide new insights into the very basic problem of the nature of flow-function coupling in endocrine organs.

Hormonal Signal Transduction and Regulation of Vascular Smooth Muscle

Chair: J. E. Faber. *Participants:* M. J. Peach, P. K. Carmines, K. P. Minneman, J. E. Faber, G. L. Stiles, and K. D. Proctor

Receptors govern communication among effector cells of the vascular wall (endothelium, smooth muscle, and nerve endings), blood cells and platelets, and tissue cells. In recent years an exciting research approach has emerged that extends beyond tradition academic disciplines, where much new information concerning receptor-mediated signal transduction and regulation of cell function has been obtained by combined use of advanced molecular, biochemical, and biophysical techniques. Research in this area is vital to the further understanding of basic vascular physiology.

Moreover, the information obtained from these studies has often been shown to have parallels in other receptor systems and cell types and may apply to a variety of physiological and pathological processes. This symposium will focus on the physiology and pharmacology of vascular angiotensin, adrenergic and adenosine receptors and will address the following questions: 1. What do we know about the coupling of angiotensin, alpha-adrenergic, and adenosine receptors and their subtypes to vascular smooth muscle contraction? 2. How are the respective receptor populations distributed on vascular wall elements different from vascular smooth muscles? What are the physiological consequences of heterogeneous receptor distributions and multiple receptor subtypes? 3. What roles do angiotensin, adrenergic, and adenosine receptors play in vascular cell function? Do the receptor-mediated functions differ among different regional circulations and/or within a given vasculature? 4. How are the respective receptor responses modified by other receptor and nonreceptor mediated cell stimuli? What is the physiological importance of these interactions?

Interrelationship Between Insulin Resistance and Hypertension

Chair: L. Rossetti. *Participants:* R. A. DeFronzo, L. Landsberg, L. Resnick, B. Draznin, R. Nosadini, and L. Rossetti

High blood pressure is associated with NIDDM independently of obesity and recent findings suggest that hypertension is in fact an insulin resistant state. However, the mechanism(s) of the reduced sensitivity to insulin and the time relationship between the development of insulin resistance and hypertension remain to be delineated. Several possible hypotheses have been advanced to justify this association. Among them are the interactions between the sympathetic nervous system, hypertension, and insulin resistance and the abnormal intracellular concentration of calcium and several other ions that have been reported in both diabetes and hypertension. Finally, great interest has been generated about the role of the overactivity of the Na^+/Li^+ cotransport and hypertension, insulin resistance, and diabetic nephropathy. The symposium will include a general overview of the major metabolic characteristics of hypertensive subjects and a presentation of the possible pathogenetic mechanisms behind this association.

Because both glucose intolerance and hyperinsulinemia may be a consequence of impaired insulin sensitivity, and because their association with hypertension represents a devastating risk factor for coronary artery disease (CAD), the understanding of the interactions between insulin resistance and hypertension may reveal important information for the prevention of CAD.

Atrial Natriuretic Factor and Cardiovascular Regulation

Chair: D. J. Ramsay. *Participants:* T. Inagami, J. A. Lewicki, P. Bie, T. Maack, and J. C. Burnett

The aim of this symposium is to cover ANF and its relation to cardiovascular regulation in breadth from cellular and molecular mechanisms to its role in physiology and pathophysiology. The synthesis, processing, and secretion of ANF will be covered, including a comparison of the posttranscriptional processing of prepro ANF through pro ANF to ANF in atrial and neuronal tissues. This will be followed by a discussion of the structural basis of atrial peptide interactions with multiple receptors subtypes. Receptor-specific ligands have served as powerful tools to assess the contribution of each atrial peptide receptor to the complex biological responses of the peptides. Atrial natriuretic peptides are known to influence renal sodium handling in a number of ways, and the operation of these complex cardiorenal interactions will be explored in conscious animal preparations. A possible role of cerebral sodium receptors will be discussed. These whole animal responses will be followed with a presentation of the distribution and functional role of ANF receptors in the mammalian organism. The clearance role of C-ANF receptors will be emphasized at organ and systemic levels, including the cellular mechanisms involved. The symposium will finish with discussion of the regulation of synthesis and release of ANF in diseases such as congestive heart failure and hypertension. This will include an exploration of the use of new pharmacological agents that inhibit the degradation of ANF and may have therapeutic uses.

Neuropeptides in Cardiovascular Regulation

Chair: S. I. Said. *Participants:* S. I. Said, T. Smitherman, J. A. Bevan, L. Edvinsson, A. Hyman, and E. G. Erdos

An increasing number of biologically active neuropeptides have been identified in the central and peripheral nervous systems. These neuropeptides form an important regulatory system, the peptidergic system, which is now considered the third component of the autonomic nervous system. Neuropeptides can influence cardiac contractility, peripheral vascular resistance, cardiac output, and blood flow to key organs, including the heart, brain, kidneys, gastrointestinal tract, and reproductive organs. In this symposium, leading investigators will discuss these aspects of cardiovascular regulation by neuropeptides, with special emphasis on the vasoactive intestinal polypeptide (VIP), neuropeptide Y, and the endothelins.

Neurohumoral Mechanisms in Bulbospinal Control of the Circulation

Chair: F. J. Gordon. *Participants:* C. J. Helke, V. S. Bishop, D. B. Averill, A. F. Sved, and F. J. Gordon

The brainstem and spinal cord contain sites of neural and neurohumoral integration as well as final common output pathways responsible for the regulation of cardiovascular function by the central nervous system. Recently, significant new information has become available that highlights the role and interaction of neurotransmitters and neurohormones in central nervous system control of cardiovascular function. The purpose of this symposium is to present current views of these systems as they relate to bulbospinal integration of information from, and output to, the cardiovascular system. Symposium presentations will include discussions of anatomical, neurochemical, pharmacological, and physiological studies of the brainstem and spinal cord as they relate to the functional physiology of central nervous system control of the heart and blood vessels.

Mechanisms of Endocrine Hypertension

Chair: A. W. Cowley and H. Raff. *Participants:* P. Ramwell, C. Gomez-Sanchez, J. Hall, A. W. Cowley, and A. Rocchini

There are many different types of hypertension. One major form of hypertension involves hormonal mechanisms. This symposium will address the mechanisms of several aspects of endocrine hypertension. It will focus on estrogens and androgens, mineralocorticoids (e.g., aldosterone), the renin-angiotensin system, vasopressin (antidiuretic hormone), and obesity (i.e., insulin and counterregulatory hormones). The main focus of the symposium will concentrate on experimental hypertension rather than epidemiological or clinical factors. Clinical correlations will be made between experimental models used and hypertension in humans.

Regulation of Angiogenesis

Chair: H. Granger. *Participants:* H. Granger, T. Maciag, D. Rifkin, C. Meininger, W. Cascells, and W. Schaper

Identification and Treatment of Cardiovascular Disease in Diabetes

Chair: G. N. Pierce and N. S. Dhalla. *Participants:* T. J. Regan, G. N. Pierce, W. H. Dillmann, J. A. Colwell, N. S. Dhalla, and J. H. McNeill

The purpose of this symposium is to provide an up-to-date concise treatise of the research describing cardiovascular disease during diabetes mellitus. Research on the basic fields of physiology, biochemistry, and molecular biology will be blended with clinical data as well. Five broad areas of cardiovascular research will be covered: cardiac performance, ionic homeostasis, contractile proteins, atherosclerosis, and therapy. Four levels of investigation will be discussed: whole organ or tissue, cellular, subcellular, and molecular. Thus, this broad spectrum of research direction and many levels of investigation should appeal to a wide variety of scientists in the field. The focus of the symposium will be timely in view of the large number of papers recently published on the topic of heart disease in diabetes.

Hormone Transport in Blood: (Still) Emerging Concepts

Chair: C. M. Mendel. *Participants:* C. M. Mendel, R. A. Weisiger, E. M. Kaptein, W. Rosner, and G. Baumann

Considerable controversy over traditional models of hormone transport and distribution in vivo has emerged in the literature in recent years. At least part of this controversy has been due to widespread misunderstanding of many of the predictions of the traditional models. One goal of this symposium will be to promote a clear understanding of the traditional models of hormone transport and distribution. With this understanding as background, the symposium will then move into new ground, exploring possible roles of hormone-binding proteins that are not a part of the traditional models.

Mendel will discuss the traditional models of hormone transport and distribution, including the free hormone hypothesis, the free hormone transport hypothesis, and the function of plasma hormone-binding proteins. Weisiger will extend these traditional models and examine their predictions in light of new concepts about the role of diffusion barriers in the uptake of hormone by tissues. Kaptein will review her extensive in vivo kinetics data for the thyroid hormones, noting where the traditional models are supported and where they are not. Rosner will then present recent work on novel nontraditional functions of CBG and SHBG. Finally, Baumann will consider the intriguing recent discovery of circulating binding proteins for polypeptide hormones.

Lectures

Endocrine and Metabolic Aspects of Aging

Speaker: E. J. Masoro

Thyroid Hormone and Cardiac Function

Speaker: E. Morkin

A Physiologist's Views of the Animal Rights Movement

Speaker: C. S. Nicoll

Panel Discussion

How to Respond to an Attack by Animal Activists

Chair: J. R. Haywood. *Participants:* To be announced.

Tutorials

Methods of Hormone Measurement

Chair: H. Raff. *Participants:* W. Wong and J. Wong

This tutorial will have two components. The first talk will be on the HPLC analysis of plasma and tissue catecholamines. The second talk will be on the immunoradiometric assay for the measurement of plasma peptides in the fmol range.

Second Messenger Systems in Vascular Smooth Muscle

Chair: R. C. Webb. *Participants:* To be announced.

Publications

Library Focus Group

On March 4, 1991, a group of librarians and library administrators met with the chairman of the Publications Committee and APS staff to share their experiences as subscribers to the consolidated *American Journal of Physiology (AJP)*, indicate the advantages and disadvantages of possible alternate modes of publication, and discuss electronic publishing.

Library Focus Group Participants

Participants of the Focus Group were Shelley Bader (director, Paul Himmelfarb Health Sciences Library, George Washington University Medical Center); Naomi Broering (director, Dahlgren Memorial Library, Georgetown University); Lois Ann Colaianni (associate director for Library Operations, National Library of Medicine); Isabel Czech (manager of publication selection, Institute for Scientific Information); Merle A. Kimball (Serials Collection Development, College of William and Mary); Hoyt Galloway (director, Walter Reed Army Medical Center Medical Library); Jeff Gardner (director of the Office of Research and Development, Association of Research Libraries); Margaret Kunz (head of acquisitions, National Institutes of Health Library); Richard Lyders (executive director, Houston Academy of Medicine, Texas Medical Center Library; Incoming President, Medical Library Association); Elizabeth McElroy (head, White Memorial Library, University of Maryland, College Park); and Salvador Waller (director, Howard University Medical Dental Library).

The professional input of the participants was sought because the production and mailing of the multi-journal consolidated *AJP* has increased in complexity every year since its inception in 1977 owing to its ever-increasing size and weight. The Publications Committee felt, however, that no change could be put into effect until the possible impact on institutional subscriptions was investigated.

Topics discussed included citation history and impact factors, indexing, binding, library measurement of usage and circulation, user satisfaction, the effect of title and volume number changes, declining library budgets, and the effect of subscription price increases. Several scenarios for breaking up the consolidated journal and their possible effects on institutional subscriptions were discussed in detail.

The group also gave valuable input on the status and future development of electronic publishing in their own institutions. The distinction was made between database publishing using CD-ROM or on-line databases and the publication of true electronic products. Topics covered included preservation and archiving, indexing, mechanical problems, service to users, interlibrary cooperation, and the library's changing role as the new technology develops.

The information and advice obtained will prove invaluable in further discussion by the Publications Committee, Editors, and Council of the future of the consolidated *AJP*.

The meeting was organized on behalf of the Society, by M. H. Conway, president of The Conway Group, a consulting firm specializing in communications and consulting for associations and their publishing programs.

Journal Editors Meeting

(l-r standing) J. A. Williams, D. H. Alpers, J. A. Schafer, M. J. Fregly, W. H. Dantzler, J. A. Michael, C. Desjardins, K. A. Hruska, M. A. Farrell Epstein, M. Frank. (l-r seated) D. Benos, B. B. Rauner, J. S. Cook, V. S. Bishop, L. Chambers, L. S. Jefferson.

Publications Committee and Journal Editors Meetings

The Publications Committee spring meeting was held on March 11, 1991, at APS headquarters followed the next day by the annual meeting of APS journal editors.

Both groups discussed the 1990 annual report on journal operations and the budgets for 1991 and 1992. Topics receiving particular attention were manuscript handling fees, guidelines for the publication of invited material, and the containment of reviewing costs. The chairman sought input on the issues raised by the Library Focus Group concerning the future of the consolidated *American Journal of Physiology* and electronic publishing.

The Publications Committee also discussed the appointments of editors, the book program, the *Advances in Physiology Education* survey, and possible monthly publication of *AJP: Lung Cellular and Molecular Physiology.*

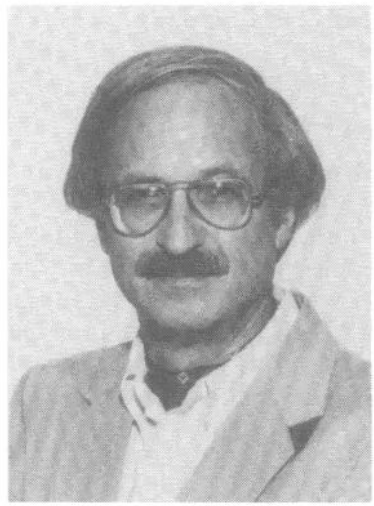
At the Editors Meeting, each editor reported on his journal. Review time, the quality of manuscript review, and the scientific quality of the papers published are the prime concerns of the editors. The three new editors, D. H. Alpers, C. Desjardins, and M. A. Farrell Epstein gave brief presentations outlining plans for their editorships. On behalf of the Society, Cook thanked J. A. Williams and L. S. Jefferson for the outstanding leadership as journal editors.

Publications Committee Meeting

(l-r standing) J. C. Liakos, L. Chambers, M. J. Fregly, J. A. Schafer, S. Chien, N. C. Staub, C. M. Tipton, M. Frank. (l-r seated) J. S. Cook, B. B. Rauner.

Introducing . . .

David H. Alpers



On July 1, 1991, David H. Alpers will assume the position as editor of the *American Journal of Physiology: Gastrointestinal and Liver Physiology*, replacing John A. Williams. The new editor is professor of medicine and chief of the division of gastroenterology at Washington University in St. Louis.

Following his BA and MD degrees at Harvard University, Alpers received his initial training in molecular and cell biology with Gordon Tomkins at the National Institutes of Health. After three more years of studying the biology of the enterocyte with Kurt Isselbacher at Harvard Medical School, he joined the faculty at Harvard in 1967. In 1969 he moved to Washington University.

Alpers has maintained an interest in the function and biology of the cells lining the gastrointestinal tract. The major processes that he has studied include the absorption and processing of nutrients across the enterocyte, and the synthesis, processing, and secretion of proteins in the enterocyte and parietal cell. Protein groups of special interest have been the alkaline phosphatases and the cobalamin-binding proteins. His principal focus has been on the function of the intact cell in vivo or in culture, using techniques of cell and molecular biology.

Alpers hopes to maintain the traditional strength of the journal by expanding coverage of gastrointestinal (and liver) organ physiology, including neural tissue, a component of gastrointestinal tissue that is rapidly assuming great importance. At the same time he wishes to broaden the scope of the journal by encouraging articles using cultured cells and subcellular systems, and using the techniques of molecular and cell biology, immunocytochemistry, and neurophysiology. Alpers will retain Gabriel Mahklouf as associate editor and will appoint as new associate editors Jackie Wood, Catherine Chew, Peter Kvietys, Neil Kaplowitz, and Henry Binder. John Dobbins will replace Binder for nine months in 1991–92 while Binder is on sabbatical leave.

News From Senior Physiologists

Letter to David Green

"I was advised to retire in 1982 after a moderate heart attack," writes **Siegmund Baum** from Bethesda, MD. "At that time I was chairman of the Experimental Hematology Department at the Armed Forces Radiobiology Research Institute and adjunct professor of physiology at the Uniformed Services University of the Health Sciences' School of Medicine.

"My recovery was exceptionally good and after only a few months I was able to participate as a consultant in a number of physiological and radiobiological studies." He also noted that since retirement he authored or coauthored several reports and served as a member of the board of trustees of the International Society for Experimental Hematology.

Irvin H. Blank reports that he now is 22 years past retirement but feels lucky to still be able and eager to be at work daily at the Harvard Medical School Department of Dermatology.

"I retired in 1986," write **Nicholas S. Assali,** "and I was very active during the two to three post-retirement years, particularly in medical history. I was involved by the University of Padua in Italy to speak before the faculty and affiliated institutions on 'The Impact of the Discovery of Blood Circulation on Fetal and Neonatal Research." More recently UCLA dedicated the 'Nicholas S. Assali Perinatal Research Laboratories' and many of my former trainees from all over the world came to the dedication ceremony.

"I am also working with my son, who is a professor of philosophy in San Francisco, on a book entitled, *Philosophy of Sex.* The book is supposed to cover the evolution of sexual behavior form the biological (my part), social, ethical, and economic (his part) points of view." He also reported that he spent 18 months gathering 500 signatures from over the world to nominate of Mikhail Gorbachev for the Nobel Peace Prize.

Letters to Steven Horvath

"Although about 90 years old, I still remember when you, with Dr. Hitchcock, were in this (physiology) department," **Emil Bozler** writes from Ohio State University. This department has been good to me and has let me work on subjects quite different from smooth muscle long after my retirement. I am working in part in Jack Rall's laboratory. Talking to him helped greatly to maintain my interest in muscle.

"I am at present thinking over some striking results which seemed inexplicable a few years ago. The solution to these problems which I have found now are so unorthodox that they could hardly be published. I have reason to believe that some of the more subtle properties of muscle are lost in experiments at the cellular and subcellular level. Something can still be learned from work on the whole muscle.

"Since I carry out hardly any experiments I have more time for other things, listening to classical music, playing piano, and taking care of a rather large garden. My wife Klare is of great help in this and many other things."

S. H. Ngai reports that he retired from Columbia University in 1988 but has been keeping busy at his own pace as professor emeritus. "First, I had to help to complete a study on mechanisms of anesthetic-induced analgesia with my colleague, Dr. A. Donald Finck, who is an associate professor of anesthesiology. We proved to our satisfaction that in dogs nitrous oxide releases enkephalins into the third cerebro-spinal fluid, but not dynorphins and beta-endorphins. Our results were presented to meetings of anesthesiologists last March and May. We started working on this subject in 1976. Our first publication suggesting that anesthetics induce analgesia through the opioid receptor-endogenous opioid peptides system raised much criticisms and controversies, existing to this day. Dr. Finck is continuing the work and I will help him whenever I am needed."

Ngai also reported that he was in Taiwan for six months last year as a visiting professor of anesthesiology and pharmacology at the National Taiwan University in Taipei.

Lena Lewis writes that she now has retired completely after taking a partial retirement in 1975 from the Cleveland Clinic, which she has seen grow from 50 doctors to about 400 doctors. From 1975 to 1985 she was parttime in laboratory medicine at the Clinic and parttime clinical chemistry professor at Cleveland State University.

Letters to John T. Reeves

"You have not heard from me in recent years because I have changed my remaining efforts from pulmonary physiology to airborne infection," **Richard L. Riley** writes from Massachusetts. "The relationships are close even though the professional societies involved are different. Infectious airborne particles are removed from rooms by room ventilation or by air disinfection, and the equations involved are comparable to the alveolar ventilation equation.

"In the AIDS era there is a great need to prevent tuberculosis, pneumocystic pneumonia, etc., in AIDs patients. My work in this field with William F. Wells at the Harvard School of Public Health antedates my first ex-

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Membership Statistics

Total Membership 7,062

Distribution by Employment (6,653 Respondents)

	No.	%
Medical schools	4,327	65
Physiology departments	2,130	32
Other preclinical departments	523	8
Clinical	1,609	24
Administration	65	1
Hospitals and clinics	285	4
Veterinary schools	147	2
Dental schools	45	1
Public health and graduate schools	112	2
Undergraduate schools	822	12
Commercial companies	200	3
Government	404	6
Institutes and foundations	199	3
Private practice	49	1
Other, emeritus or inactive	63	1

Distribution by Racial Background and Heritage (Optional personal data)

	Total respondents
American Indian or Alaskan	12
Asian or Pacific Islander	403
Black	54
White	5,116
Hispanic	110

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

California	726
New York	607
Texas	405
Maryland	360
Pennsylvania	359
Massachusetts	317
Illinois	310
Ohio	253
Michigan	201
New Jersey	185
Florida	183
North Carolina	173
Missouri	154
Virginia	137
Connecticut	126
Wisconsin	122
Minnesota	122
Georgia	116
Tennessee	112
Indiana	103
Washington	102
Kentucky	101

Distribution by Sex (Optional personal data)

	Total respondents
Female	786
Male	5,608

APS Membership in The Americas

US	6,405
Canada	323
Argentina	4
Brazil	12
British West Indies	4
Mexico	11
Peru	1
Chile	5
Venezuela	4
Guatemala	1

Canadian Provinces with 5 or More Members

Ontario	126
Quebec	78
Alberta	37
British Columbia	35
Manitoba	23
Nova Scotia	12
Saskatechewan	8

Other provinces represented
New Brunswick
Newfoundland
Prince Edward Island

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

Japan	61
Federal Republic of Germany	51
United Kingdom	37
Switzerland	27
Italy	25
France	22
Australia	18
Netherlands	16
Israel	13
Belgium	12
Sweden	12
Spain and Canary Islands	11
Norway	10
Denmark	8
Taiwan	8
Austria	6
PRC	5
Greece	5
New Zealand	5

Distribution by Earned Degree (6,486 Respondents) (Includes 907 individuals with multiple doctorate degrees)

PhD	4,470
MD	2,578
DDS and other	163
DVM	160

Principle Type of Work (6,708 Respondents)

	%
Research	72
Teaching	13
Administration	7
Clinical	7
Other	1

Statistics represent membership as of March 1991

Distribution of Age (Optional personal data)

	Total respondents
70+	727
60-69	1,256
50-59	1,596
40-49	2,043
30-39	1,050
20-29	122

Distribution by Primary Specialty (6,568 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	6

Other countries represented

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

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faculty compensation. Our efforts to solve this inconsistency were less than successful. The report shows total annual compensation regardless of whether this amount represents 9-, 10-, 12-, or in some instances, 13-month salaries. Time and staffing constraints did not permit extensive interactions with *all* departments providing information, and some refinement of this section is also required. Three departments did not report salary information, and the information provided by a fourth department was considered too ambiguous to include. Despite the various problems, we believe the 1990-91 questionnaire provides substantially more information than was available previously.

All figures relating to salaries, stipends, and budgets are in whole US dollars. Minimum, maximum, and mean salaries have been determined for chairs, professors, associate professors, assistant professors, and instructors (without regard to sex). The percentage change from last year's averages has been deleted because the basis for collecting information was radically changed.

New information is provided in Table 4, "Complete Primary Ranking According to Outside Research Dollars." Research dollars are those identified as generated by all faculty for whom the department is the academic home (column 2, on page 77). Where individual information was not provided in this category, information from column 1 of the questionnaire was used. Research space shown in this table is that identified on the questionnaire as "occupied research space" (column 2, page 77). Where individual information was not provided in this category, information from column 1 was used. In previous years, office space occupied by research personnel may have been included in research space. All of these changes may affect research income and space rank. Additional information is provided and ranked for research dollars per square foot of research space. We hope this information will be of value to you.

Specific information is once again provided regarding graduate programs (stipends, sources of support, areas of study/research).

TABLE 1. **Faculty Salaries for Fiscal Year 1990-1991**

	Mean	Mininum	Maximum	Number of Faculty
Chairpersons				
All Schools	$108,259	$40,500	$212,054	109
Medical Public	110,236	66,908	160,000	59
Medical Private	111,650	40,500	212,054	36
Nonmedical	91,212	57,000	133,024	14
Female	77,310	57,000	93,136	3
Professors				
All Schools	77,582	11,626	167,700	558
Medical Public	76,966	11,626	167,700	392
Medical Private	81,236	15,000	156,700	175
Nonmedical	72,793	12,400	134,000	83
Female	80,704	48,000	131,000	51
Associate Professors				
All Schools	56,484	29,342	113,095	473
Medical Public	56,724	29,342	92,000	264
Medical Private	57,309	34,000	113,095	144
Nonmedical	53,727	30,000	104,729	65
Female	57,828	38,360	92,250	77
Assistant Professors				
All Schools	44,642	2,124	67,650	338
Medical Public	44,221	2,124	65,500	182
Medical Private	45,863	29,800	67,650	124
Nonmedical	42,302	21,251	55,755	32
Female	44,184	2,124	66,595	68
Instructors				
All Schools	35,064	20,160	77,731	60
Medical Public	34,662	20,160	52,140	25
Medical Private	35,836	20,846	77,731	32
Nonmedical	30,167	25,500	35,000	3
Female	31,036	25,000	40,556	15

In summary, we would like to thank all parties who participated in this venture, and we urge them to communicate their criticisms and suggestions to us as we continue to work on the needed modifications over the summer. All such comments will be shared with the Executive Council and the membership.

For some of the analyses, 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 a medical (MD/DO) (96) or nonmedical (7) school. Types of schools specified as nonmedical: dental (1), podiatric (1), veterinary (3), and other (2).

Primary affiliation: public (72) or private (42) with one school claiming both public and private affiliation.

Numbers of Faculty with Primary Academic Appointments in Department

Figures shown are for the total number of faculty. Numbers in parentheses are average number of faculty per department. The numbers in the various subsidiary columns in the **Primary Faculty** table may not total the Number of Faculty column due to variation of information provided on the individual forms.

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

Chairpersons			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	$111,562	24	0-5	$73,483	181	0-5	$55,852	214	0-5	$44,681	266	0-5	$33,569	52
6-10	104,476	30	6-10	77,039	116	6-10	55,956	114	6-10	45,527	39	6+	45,688	6
11-15	110,323	16	11-15	79,087	138	11-15	57,283	72	11-15	47,038	10			
16-20	110,226	19	16-20	81,060	99	16-20	56,942	25	16-20	44,505	5			
21-25	104,052	7	21-25	83,007	61	21-25	61,631	12	21-25		0			
26+	99,782	4	26+	74,636	21	26+	62,492	3	26+	37,150	2			

TABLE 3. **Salaries by Region**

	Mean	Minimum	Maximum	No.		
Chairpersons						
Northeast	$111,561	$57,000	$212,054	26		
Midwest	107,346	62,000	143,730	26		
South	109,376	75,500	175,000	31	Northeast:	ME NH VT NY MA RI CT NJ PA MD DE DC
West	106,518	58,116	156,000	15		
Canada	111,385	66,908	151,836	3		
Professors						
Northeast	84,980	34,000	156,700	162	Midwest:	MI OH IN IL WI IA MO KS NE ND SD MN
Midwest	73,507	15,000	123,200	146		
South	74,782	38,652	134,000	173		
West	79,926	12,400	167,700	114		
Canada	68,201	11,626	99,639	28	South:	VA WV KY TN NC SC GA FL AL MS AR LA OK TX
Associate Professors						
Northeast	60,629	34,000	113,095	122		
Midwest	55,524	34,150	80,831	110		
South	53,781	30,000	82,000	142	West:	AK HI MT WY CO NM AZ ID NV WA OR CA UT
West	56,033	39,607	92,000	46		
Canada	56,591	29,342	74,366	22		
Assistant Professors						
Northeast	46,471	28,752	67,650	80		
Midwest	45,795	17,000	65,500	86		
South	43,494	28,000	60,000	86		
West	42,962	21,251	63,200	36		
Canada	40,326	2,124	55,757	16		
Instructors						
Northeast	41,535	26,000	77,731	21		
Midwest	30,393	22,804	37,000	6		
South	29,983	20,160	48,000	26		
West	46,070	40,000	52,140	2		
Canada	35,201	27,951	46,215	3		

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

Rank	Grant Income	Grant Income per Faculty	Rank Grant Income per Faculty	Research Space (sq. ft.)	Research Space per Faculty	Rank (Total Research Space)	Research Dollars per sq. ft.	Rank Research Dollars per sq. ft.	No. Faculty
1	$10,326,309	$349,740	3	26,964	1,226	5	$383	2	30
2	$6,130,100	$613,010	2	17,760	1,776	17	$345	4	10
3	$4,912,083	$313,509	4	14,438	551	38	$340	5	19
4	$4,824,810	$185,570	11	22,373	957	10	$216	12	26
5	$4,705,900	$303,447	6	33,591	2,587	1	$140	39	17
6	$4,371,825	$156,137	19	13,906	497	40	$314	6	28
7	$4,151,788	$167,312	15	17,744	612	18	$234	11	26
8	$4,090,624	$136,354	25	23,261	1,551	9	$176	30	30
9	$3,876,884	$184,614	12	18,500	1,233	16	$210	18	21
10	$3,713,339	$618,890	1	7,500	1,250	80	$495	1	6
11	$3,337,026	$166,851	16	9,492	712	70	$352	3	20
12	$3,132,697	$130,529	27	16,503	688	29	$190	24	24
13	$3,105,000	$194,063	9	24,921	1,691	6	$125	46	16
14	$2,950,832	$196,722	8	17,467	1,164	20	$169	33	15
15	$2,842,513	$157,917	18	10,178	565	60	$279	8	18
16	$2,828,749	$176,797	13	17,096	1,069	24	$165	35	16
17	$2,827,978	$113,119	38	27,604	1,314	3	$102	61	25
18	$2,785,000	$199,000	7	11,700	900	51	$238	10	15
19	$2,718,162	$100,673	42	24,342	765	8	$112	54	27
20	$2,669,188	$116,574	37	15,605	918	32	$171	31	25
21	$2,519,499	$175,902	14	13,800	684	41	$183	27	19
22	$2,499,595	$120,457	33	11,851	790	50	$211	17	21
23	$2,457,101	$189,008	10	19,785	1,522	14	$124	47	13
24	$2,452,156	$90,821	47	32,541	1,205	2	$75	76	27
25	$2,371,685	$78,541	56	20,483	1,280	12	$116	52	31
26	$2,281,411	$117,524	35	12,348	650	47	$185	25	21
27	$2,275,575	$53,717	79	15,027	1,263	35	$151	37	46
28	$2,236,313	$101,651	40	13,113	503	43	$171	32	22
29	$2,221,797	$128,619	29	16,705	700	27	$133	41	20
30	$2,127,297	$101,300	41	11,542	550	52	$184	26	21
31	$2,094,182	$149,584	21	10,429	776	58	$201	21	14
32	$2,043,954	$123,658	31	9,486	952	71	$215	13	20
33	$2,032,795	$119,576	34	9,500	396	69	$214	15	17
34	$2,011,396	$134,093	26	9,600	640	65	$210	18	15
35	$2,001,177	$87,031	49	18,972	791	15	$105	59	24
36	$1,970,300	$78,812	55	7,643	306	79	$258	9	25
37	$1,908,371	$73,399	64	19,962	1,511	13	$96	66	26
38	$1,856,053	$123,737	30	17,217	1,148	23	$108	57	15
39	$1,850,000	$143,750	23	9,553	955	66	$194	23	16
40	$1,817,113	$151,426	20	5,892	491	93	$308	7	12
41	$1,759,542	$65,168	71	14,897	552	36	$118	51	27
42	$1,753,943	$83,521	50	14,608	696	37	$120	50	21
43	$1,747,062	$145,589	22	8,239	687	77	$212	16	12
44	$1,724,735	$74,988	59	16,534	787	28	$104	60	23
45	$1,703,000	$121,643	32	17,000	1,214	25	$100	63	14
46	$1,684,114	$129,547	28	10,000	769	62	$168	34	13
47	$1,546,841	$81,413	53	12,316	648	48	$126	45	19
48	$1,509,987	$88,823	48	24,872	1,997	7	$61	85	17
49	$1,500,000	$53,571	80	16,295	582	30	$92	67	28
50	$1,483,861	$98,924	44	13,367	891	42	$111	55	15
51	$1,483,246	$92,703	46	13,000	859	44	$114	53	16
52	$1,473,964	$210,566	6	7,450	1,064	81	$198	22	7
53	$1,400,000	$116,667	36	15,308	1,276	34	$91	68	12
54	$1,389,501	$77,195	58	17,290	961	21	$80	74	18
55	$1,325,328	$73,629	63	10,503	584	57	$126	44	18
56	$1,299,041	$99,926	43	9,273	713	72	$140	39	13

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

Rank	Grant Income	Grant Income per Faculty	Rank Grant Income per Faculty	Research Space (sq. ft.)	Research Space per Faculty	Rank (Total Research Space)	Research Dollars per sq. ft.	Rank Research Dollars per sq. ft.	No. Faculty
57	$1,215,135	$60,757	76	6,821	341	86	$178	29	20
58	$1,180,000	$70,451	67	10,800	580	54	$109	56	20
59	$1,171,057	$61,635	75	9,524	560	67	$123	48	19
60	$1,168,096	$83,435	51	15,490	1,106	33	$75	76	14
61	$1,138,368	$94,864	45	6,741	978	88	$97	65	12
62	$1,136,711	$71,044	66	17,261	1,079	22	$66	82	16
63	$1,103,410	$52,543	82	15,750	750	31	$70	80	21
64	$971,000	$74,692	60	10,859	651	53	$89	69	13
65	$963,867	$74,144	62	9,076	698	74	$106	58	13
66	$956,605	$136,658	24	4,590	656	95	$208	20	7
67	$942,026	$104,670	39	6,142	682	92	$153	36	9
68	$910,081	$40,380	89	21,407	1,070	11	$43	96	24
69	$905,426	$69,648	68	27,564	2,120	4	$33	99	13
70	$895,884	$74,196	61	14,000	1,556	39	$64	83	13
71	$876,967	$161,173	17	6,872	1,145	85	$128	42	9
72	$854,989	$65,768	69	8,608	783	76	$99	64	13
73	$843,166	$56,211	77	17,000	1,133	26	$50	91	15
74	$840,000	$72,700	65	10,300	687	59	$82	73	15
75	$815,048	$81,505	53	9,800	1,311	63	$83	70	10
76	$770,790	$48,174	85	6,383	426	90	$121	49	16
77	$759,231	$53,484	81	9,652	804	64	$79	75	17
78	$754,290	$34,286	93	12,774	581	45	$59	87	22
79	$702,795	$63,890	73	12,755	1,160	46	$55	89	11
80	$650,000	$54,167	78	7,831	569	78	$83	71	12
81	$623,000	$51,917	84	2,907	291	101	$214	14	12
82	$602,238	$35,426	90	8,949	814	75	$67	81	17
83	$589,670	$45,359	87	10,071	916	61	$59	86	13
84	$575,000	$82,143	52	12,000	1,714	49	$48	92	7
85	$523,935	$52,394	83	7,450	745	82	$70	79	10
86	$522,400	$65,300	70	3,600	450	99	$145	38	8
87	$512,115	$22,266	99	17,551	763	19	$29	101	23
88	$486,000	$34,714	92	6,800	486	87	$71	78	14
89	$464,555	$77,426	57	3,690	615	98	$126	43	6
90	$438,300	$62,614	74	9,515	1,359	68	$46	94	7
91	$391,383	$43,487	88	3,833	426	97	$102	62	9
92	$387,741	$64,624	72	6,275	1,046	91	$62	84	6
93	$348,254	$35,036	91	10,545	1,506	56	$33	98	7
94	$332,086	$20,755	100	7,276	525	84	$46	95	16
95	$262,000	$29,111	96	5,600	622	94	$47	93	9
96	$259,595	$32,449	94	10,591	1,513	55	$25	102	8
97	$240,000	$26,667	97	4,046	337	96	$59	88	12
98	$236,238	$47,248	86	2,880	576	103	$82	72	5
99	$218,000	$24,917	98	1,200	587	106	$182	28	12
100	$158,000	$31,600	95						5
101	$129,696	$16,212	101	6,691	836	89	$19	104	8
102	$127,862	$15,983	102	7,427	928	83	$17	105	8
103	$95,665	$9,566	104	2,883	412	102	$33	97	10
104	$85,000	$12,143	103	3,430	590	100	$25	103	7
105	$50,000	$8,333	105	1,642	274	105	$30	100	6
106	$40,000	$6,667	107	760	152	109	$53	90	6
107	$30,000	$3,333	108						9
108	$29,140	$7,285	106	2,690	673	104	$11	106	4
109	$5,000	$1,000	109	600	120	110	$8	107	5
110	$1,000	$333	110	1,100	367	107	$1	108	3
111				800	267	108		109	4
112				9,086	1,136	73		110	10
113									8

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

	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
PhDs granted	222	184	157	143	98	113	135	153	137	165
Degrees to minorities										
Female	72	74	62	38	32	40	42	32	40	41
American Indian/Alaskan Native	0									
Asian/Pacific Islander	12									
Black, not of Hispanic origin	3	9	9	3	2	1	2	2	4	3
Hispanic	11									
Area of study (%)										
Cardiovascular	See Table 6	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	1,649	1,327	1,299	1,225	1,002	1,040	1,329	991	1,043	1,036
Foreign	558	437	371							
(Percent)	33.80	32.90	28.50							
Postdocs in program	913	783	764	637	497	524	534	534	475	493
Foreign	492	400	388							
(Percent)	53.90	51.10	44.20							
Vacant postdoctoral positions		84	92	84	59	59	64	52	51	53
Faculty positions available	245	201	173	146	118	111	130	132	147	131
Stipends (beginning levels)										
PhD students	$10,596	$10,260	$9,389	$7,847	$7,530	$7,244	$6,600	$5,845	$5,609	
Postdocs	$18,960	$19,373	$18,741	$19,783	$17,120	$16,890	$15,634	$14,689	$14,097	

TABLE 6. **Completed Trainees and Their Subdisciplines**

Organ Systems: Choose only one

Predoctoral	Postdoctoral	Female, Pre and Post	Organ System	Cardiovascular	Endocrine	Gastrointestinal	General (Multi-Organ)	Muscular	Neural	Renal	Respiratory	Other
42	35	19		77								
30	27	16			47							
12	17	14				29						
18	26	12					44					
6	7	6						13				
26	30	9							56			
3	4	2								7		
9	9	2									18	
3	3	2										6

Other Organ Systems: Liver (n=1); Plant

Approach: Choose as many as applicable

Approach	Biophysical	Cellular	Comparative	Developmental	Environmental	Exercise	Metabolic	Molecular	Neural	Reproductive	Systems	Theoretical	Transport	Other
	21	42	–	3	4	6	16	16	7	3	27	3	8	7
	3	25	3	10	–	1	7	13	8	17	5	–	6	3
	7	20	1	2	–	–	2	3	7	–	10	–	5	–
	17	37	3	2	2	–	9	11	1	1	14	2	10	1
	9	7	–	–	–	–	1	3	3	–	3	1	5	–
	15	24	4	10	1	–	3	8	32	–	14	2	3	–
	2	4	1	–	1	–	1	2	1	–	2	–	4	–
	1	2	1	–	3	2	2	–	1	1	5	3	7	–
	5	4	–	–	–	–	–	3	–	–	–	–	–	–

Other Approaches: Biochemical (n=5); Pharmacological/Toxicological (n=6)

TABLE 7. **Training Support**

	%Total/Year						
	1990	1989	1988	1987	1986	1985	1984
Predoctoral							
Training grants	12	11	12	13	12	12	16
Individual federally funded awards	2	3	3	3	4	3	4
Research grants	31	30	29	30	26	24	22
State funds	22	22	24	26	31	30	25
Private foundations	3	3	2	4	4	4	3
Institute awards	20	17	20	15	14	19	20
Medical scientist training program	2	6	2	2	2	2	4
Home (foreign) government	2						
Other	6	8	7	7	7	5	7
Posdoctoral							
Training grants	12	13	14	18	18	18	22
Individual federally funded awards	9	10	11	10	19	15	22
Research grants	55	56	51	55	41	45	32
State funds	3	2	2	3	4	5	3
Private foundations	10	11	12	7	10	8	12
Institutional awards	5	3	3	2	4	6	4
Medical scientist training programs	0	0	0	1	1	1	1
Home (foreign) government	5						
Other	1	5	7	5	3	3	4

TABLE 8. **Primary Faculty Subdisciplines**

Organ Systems: Choose only one

Organ Systems	Cardiovascular	Endocrine	Gastrointestinal	General (Multi-Organ)	Muscular	Neural	Renal	Respiratory	Other	
	387	265	98	255	115	406	122	134	11	

Other Organ Systems: Bone (n=2); Liver (n=5); Plant (n=4)

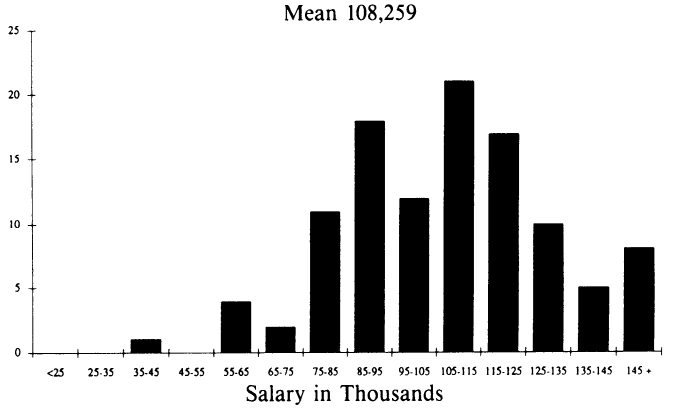
Approach: Choose as many as applicable

Approach	Biophysical	Cellular	Comparative	Developmental	Environmental	Exercise	Metabolic	Molecular	Neural	Reproductive	Systems	Theoretical	Transport	Other		
	127	167	29	27	25	48	76	73	64	8	167	43	67	14		
	22	147	27	45	12	3	61	114	42	96	67	5	14	2		
	24	51	7	12	3	1	19	17	14	–	23	9	29	–		
	81	121	17	25	19	7	48	79	7	5	29	32	53	6		
	53	68	5	9	5	20	15	29	15	5	12	7	23	1		
	108	163	38	49	18	6	18	80	224	14	90	38	31	3		
	24	58	16	8	7	1	23	22	11	2	50	5	53	2		
	22	37	11	14	21	18	22	18	25	3	61	14	17	3		
	2	9	–	–	–	–	4	6	1	–	–	–	31	1		

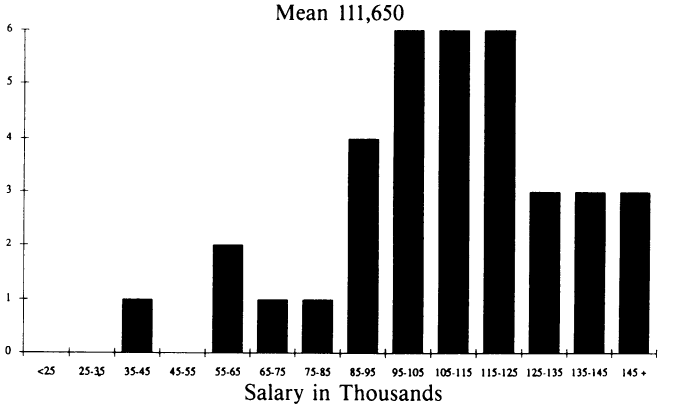
Other Approaches: Anatomical (n=1); Biochemical (n=13); Pathophysiological (n=7); Pharmacological/Toxicological (n=11)

Chairmen

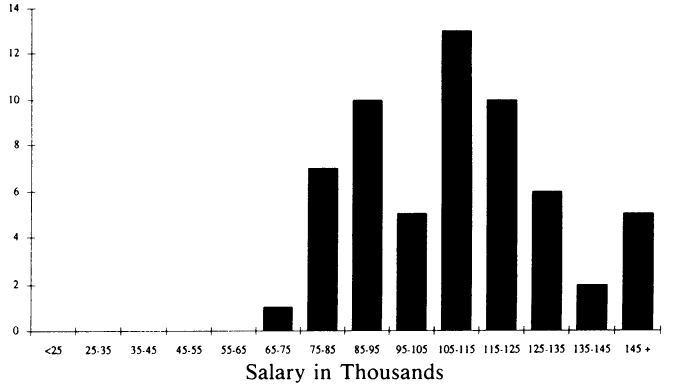
All Chairmen
Mean 108,259



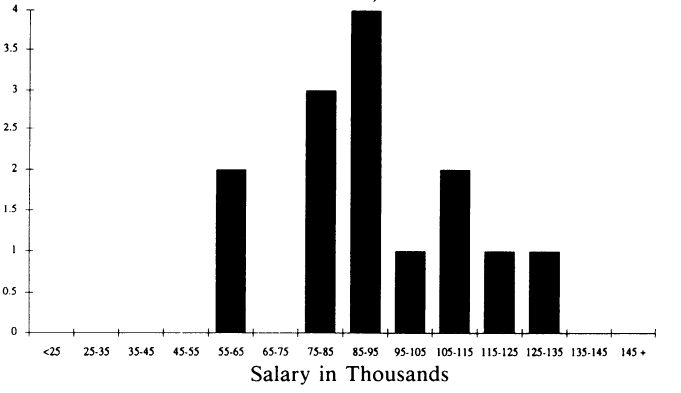
Medical Private Chairmen
Mean 111,650



Medical Public Chairmen
Mean 110,236

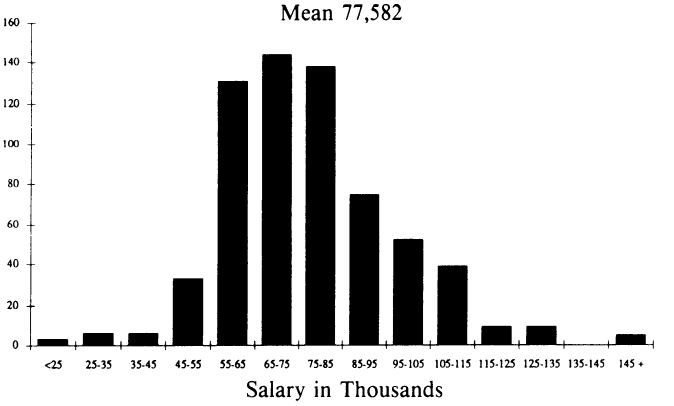


Nonmedical Chairmen
Mean 91,212

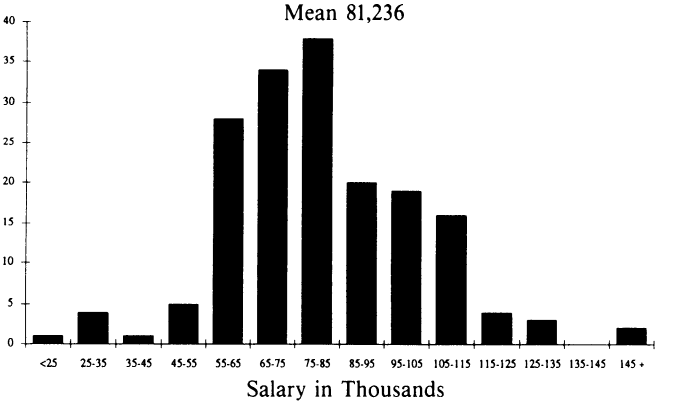


Professors

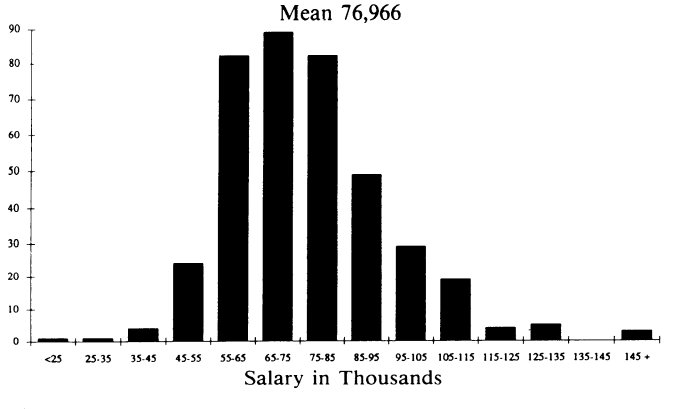
All Professors
Mean 77,582



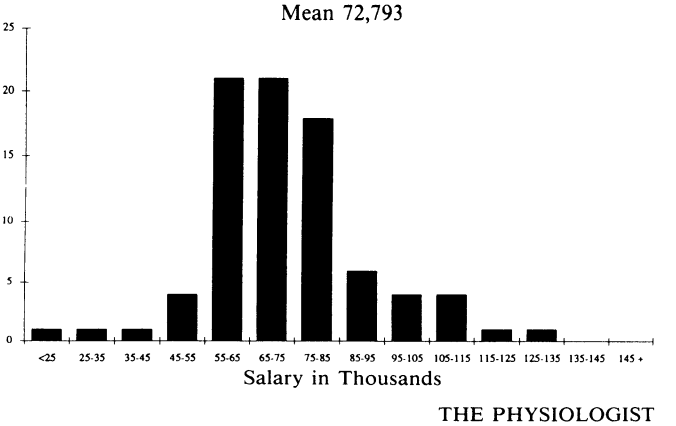
Medical Private Professors
Mean 81,236



Medical Public Professors
Mean 76,966

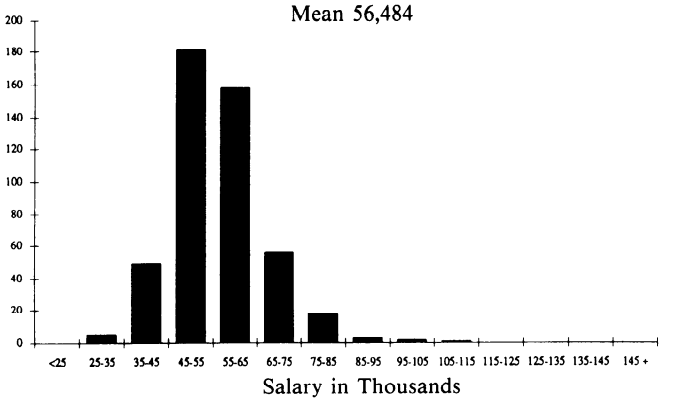


Nonmedical Professors
Mean 72,793

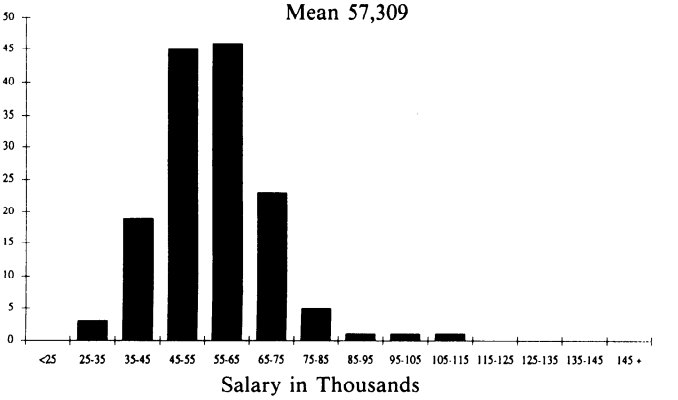


Associate Professors

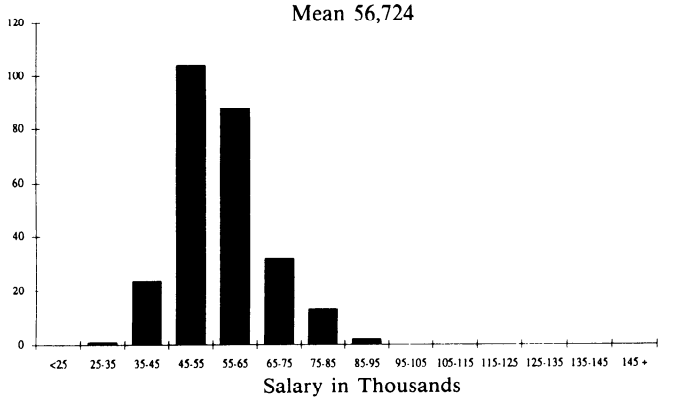
All Associate Professors
Mean 56,484



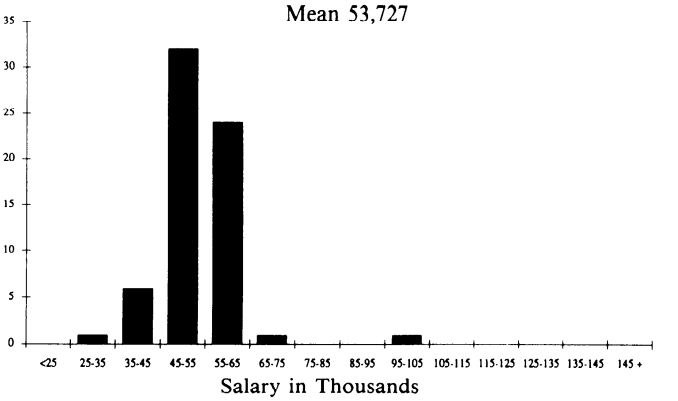
Medical Private Associate Professors
Mean 57,309



Medical Public Associate Professors
Mean 56,724

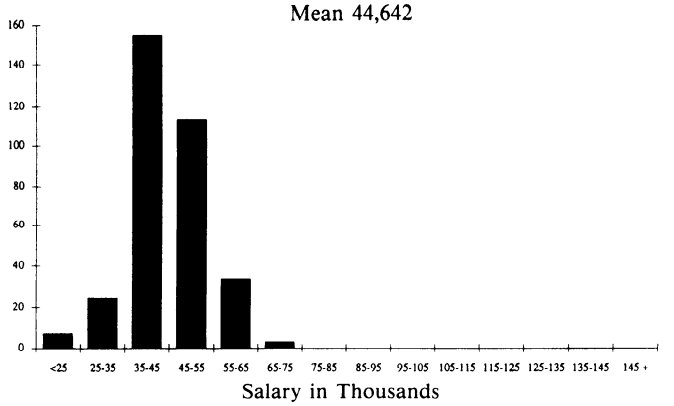


Nonmedical Associate Professors
Mean 53,727

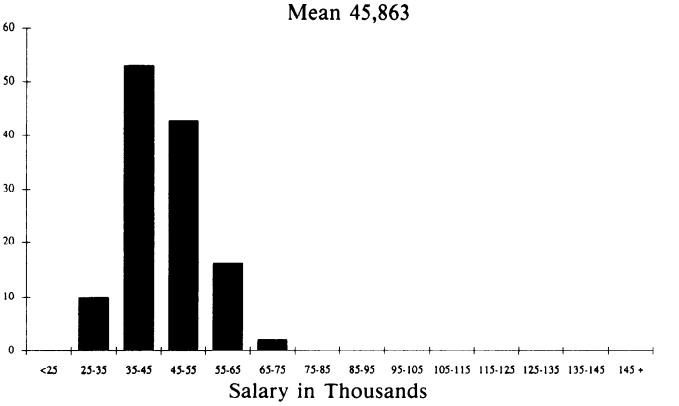


Assistant Professors

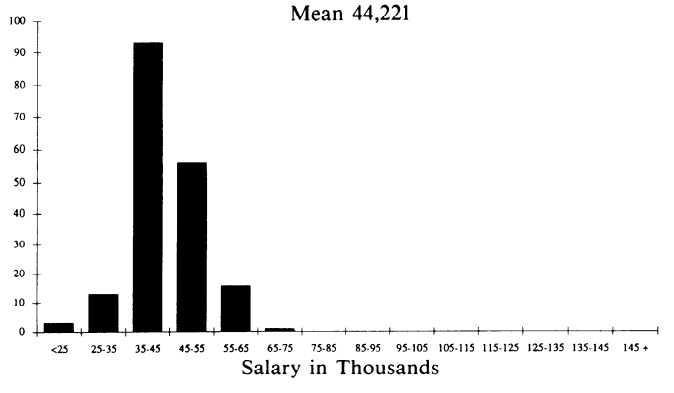
All Assistant Professors
Mean 44,642



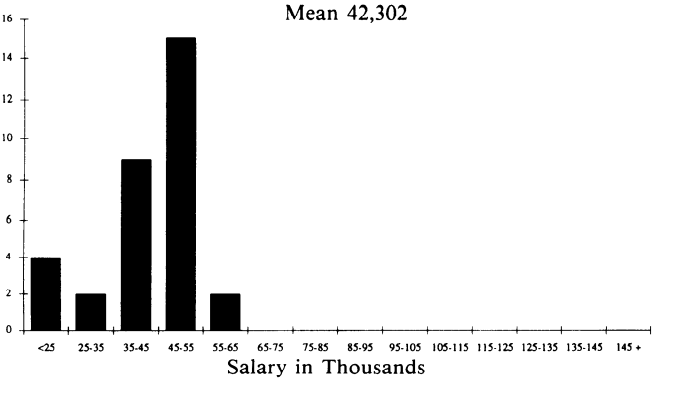
Medical Private Assistant Professors
Mean 45,863



Medical Public Assistant Professors
Mean 44,221

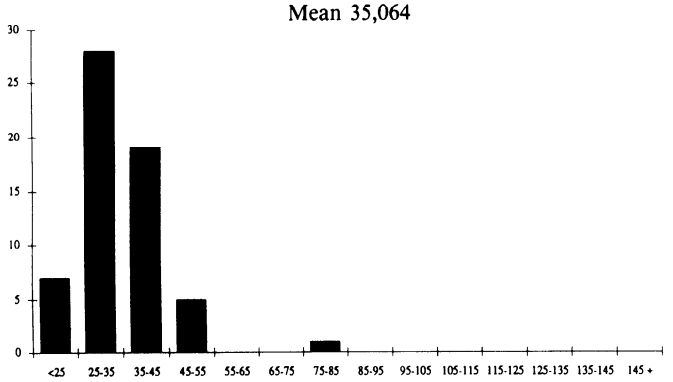


Nonmedical Assistant Professors
Mean 42,302

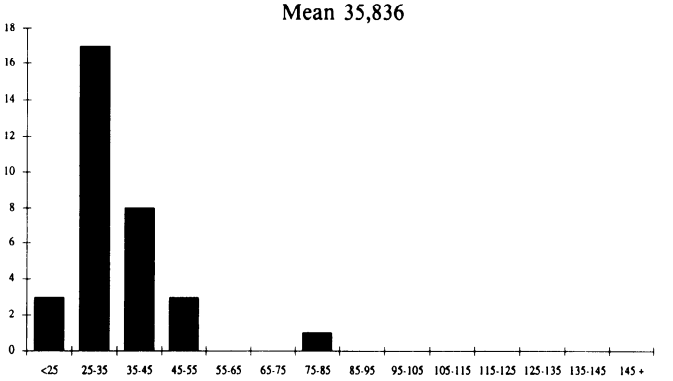


Instructors

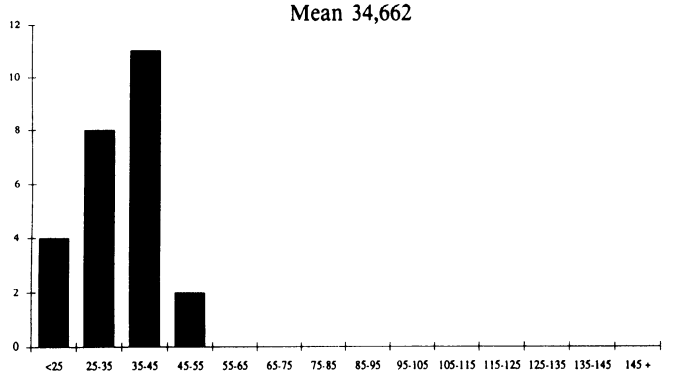
All Instructors
Mean 35,064



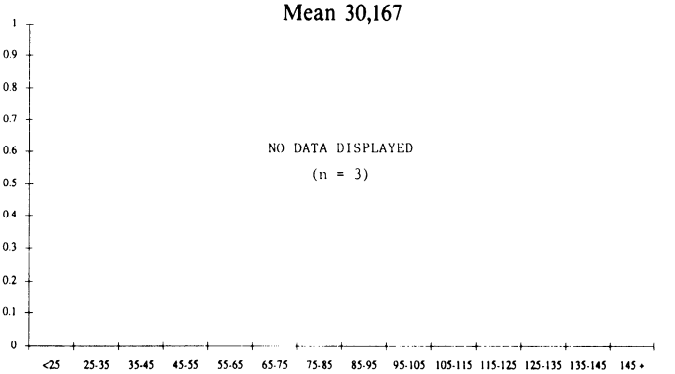
Medical Private Instructors
Mean 35,836



Medical Public Instructors
Mean 34,662



Nonmedical Instructors
Mean 30,167



Type of Institution

Support		Health Care Orientation		Science Orientation	
Private	42	MD/DO	72	Life Science	82
Public	72	DDS	11	Bioengineering	8
		DVM	5	Multiple	23
		Allied Health	23	Other	0
		Multiple	25		
		Other (Podiatry)	1		

Estimated number of positions expected to become vacant in the next five years due to retirement, new FTEs, etc.

	91-92	92-93	93-94	94-95	95-96
Creation of new FTEs	39	25	18	9	12
Failure to promote/tenure	5	1	1	1	0
Retirement	27	29	28	25	28
Resignation	6	7	6	5	4
Other	0	1	2	0	1

Unfilled Primary Positions

Unfilled departmental positions.

Professor	24	Assistant Professor	81
Associate Professor	23	Instructor	7

Reasons for unfilled positions.

Creation of new FTEs	46	Retirement	29
Failure to promote/tenure	4	Resignation	40
Death	7	Other	5

Current Graduate and Postdoctoral Students and Trainees

Do the primary faculty in your department participate in physiology PhD training either in a department-based program or as part of a multi-department, -college, -campus, or committee-based program?
yes 105 no 6

Are there postdoctoral associates, trainees, or fellows in laboratories of your primary faculty? yes 104 no 7

Total number of pre- and postdoctoral students/trainees/fellows in program as described above:

predoctoral male	956	postdoctoral male	598
predoctoral female	693	postdoctoral female	315

Total number of foreign pre- and postdoctoral trainees in program as described above:

predoctoral male	348	postdoctoral male	357
predoctoral female	210	postdoctoral female	135

Ethnicity of each pre- and postdoctoral trainee who is either a U.S. citizen or an alien holding permanent residency status:

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
American Indian/Alaskan Native	0	1	0	0
Asian or Pacific Islander	80	53	48	22
Black, not of Hispanic origin	41	30	8	3
Hispanic	26	24	9	13
White, not of Hispanic origin	519	374	210	162

Primary Faculty

	Degree(s) Held							
	PhD Only	MD Only	Both	Other	Number of Faculty	Tenured	Tenure-eligible but not tenured	Not tenure-eligible
No. of primary faculty in each category in your department	1,515	116	86	43	1,760 (15.57)	1,094 (9.68)	311	264
Of this no., no. your department is responsible for in terms of salary, space, etc.	1,221	77	73	36	1,436 (12.71)	794 (7.03)	238	108
Primary faculty for whom you provide partial salary and are associated with:								
Another basic science dept.	17	0	0	0	17	5	0	0
A clinical department	24	9	9	0	43	19	2	2
An administrative unit	20	4	1	1	26	9	0	10
An affiliated institution	16	2	1	0	19	2	1	6
Emeritus Faculty for whom you provide office and/or laboratory space regardless of whether salary is provided	37	16	6	0	59	17	0	10

Joint Faculty

	Degree(s) Held							
	PhD Only	MD Only	Both	Other	Number of Faculty	Tenured	Tenure-eligible but not tenured	Not tenure-eligible
Associated with:								
Another basic science dept.	218	11	7	4	243	143	38	21
A clinical department	256	302	64	10	632	238	84	90
An administrative unit	28	5	2	9	44	19	3	12
An affiliated institution	128	22	11	5	166	10	8	73
Joint faculty for whom you provide partial salary and are associated with:								
Another basic science dept.	12	0	0	0	12	5	4	0
A clinical department	18	17	5	3	44	27	4	9
An administrative unit	3	1	0	1	5	1	1	2
An affiliated institution	8	3	0	0	11	0	0	2

Number of foreign pre- or postdoctoral trainees from each of the listed areas of origin:

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
African	15	4	15	2
Asian or Pacific Islander	243	158	156	60
Central and South American, etc.	12	15	32	4
European, Canadian, Australasian, etc.	51	23	130	52
Middle Eastern	22	8	15	8
Other	10	3	4	2

Number of foreign pre- or postdoctoral trainees whose primary source of support is:

	Predoctoral	Postdoctoral
Institutional	293	45
Research grants	227	374
Private foundations	26	63
Home (foreign) government	34	44
Other	36	25

Training Support

	Predoctoral		Postdoctoral	
Is there a training grant (or grants) based in your department that supports predoctoral and postdoctoral trainees?	yes	34	yes	41
	no	71	no	63
Do your predoctoral and postdoctoral students have access to a training grant based in another department or in an interdisciplinary or committee-based training program?	yes	41	yes	38
	no	61	no	64
Average annual starting stipend (in US dollars) for predoctoral and postdoctoral trainees	$10,596	mean	$18,960	mean
	3,500	min	3,500	min
	26,016	max	30,506	max

Do your predoctoral students who are not supported by an NIH training grant, NSF or MARC fellowship, etc., personally pay out-of-state tuition? yes 17 no 80

If yes to preceding question, then indicate percent of total fee paid: mean 82.33% range 15%-100%

Do your predoctoral students who are not supported by an NIH training grant, NSF or MARC fellowship, etc., personally pay in-state and/or out-of-state registration fees?
yes 31 no 67

Number of predoctoral and postdoctoral trainees primarily supported by:	Predoctoral	Postdoctoral
Training grants	187	103
Individual federally funded awards	41	81
Research grants	491	487

State funds (teaching assistantships, etc.)	353	26
Private foundations	55	85
Institutional awards	318	47
Medical Scientist Training Program	30	0
Home (foreign) governments	32	42
Other	99	9

Trainee Completions

Number of trainees who have completed doctoral or postdoctoral work during the year ended June 30, 1990.

Predoctoral		Postdoctoral	
Male	Female	Male	Female
150	72	180	65

US citizens or aliens holding permanent resident status

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
American Indian/Alaskan Native	0	0	0	0
Asian or Pacific Islander	10	2	5	1
Black, not of Hispanic origin	2	1	1	1
Hispanic	4	7	3	0
White, not of Hispanic origin	77	32	54	30

Foreign nationals

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
African	2	0	0	0
Asian or Pacific Islander	16	10	45	4
Central and South American	2	1	9	1
European, Canadian, Australasian, etc.	5	0	33	14
Middle Eastern	1	0	5	5
Other	0	0	1	0

No. of the trainee completions that have found a subsequent position.	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
US citizens or aliens holding permanent resident status	117	55	95	43
Foreign citizens	30	17	88	27

No. of trainee completions still needing placement.	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
US citizens or aliens holding permanent resident status	0	1	1	0
Foreign citizens	0	1	3	1

APS Membership

Membership applications may be obtained from APS Membership Services, 9650 Rockville Pike, Bethesda, MD 20814-3991. Applications are reviewed and approved by Council on a regular basis throughout the year.

Other Programs

Members of primary faculty also involved in other PhD training programs.

Program	No. of Primary Physiology Faculty	No. of Joint Physiology Faculty	No. of Students in Program
Bioengineering	48	13	634
Biophysics	94	38	170
Cell Biology	136	22	336
Neuroscience	223	78	447
Animal Science	6	10	109
Biochemistry	22	7	99
Microbiology	2	0	25
Pharmacology/ Toxicology	7	4	45

Applicants to Graduate Program

No. of completed applications received for the physiology graduate training program with which department is affiliated.
2,685 (101 departments reporting)

No. of these applicants accepted. 806

Of those accepted, no. enrolled. 471

If the GRE is used as an evaluating factor, the average numeric (not percentile) score for the following areas are:

V 517 (69 depts.) Q 653 (69 depts.) A 589 (66 depts.)

Primary Faculty Salaries for Fiscal Year 1990-1991

Departmental Faculty

Ethnicity of each primary and joint faculty member who is either a US citizen or an alien holding permanent resident status.

	Primary		Joint	
	Male	Female	Male	Female
American Indian/Alaskan Native	1	1	5	1
Asian or Pacific Islander	98	19	50	2
Black, not of Hispanic origin	24	3	7	1
Hispanic	37	9	15	4
White, not of Hispanic origin	1,230	213	702	98

Information on area of origin for each faculty member who is NOT listed above.

	Primary		Joint	
	Male	Female	Male	Female
African	0	0	1	0
Asian or Pacific Islander	17	1	6	0
Central and South American	8	2	1	1
European, Canadian, Australasian, etc.	26	9	7	1
Middle Eastern	2	1	0	0
Other (Identify)	16	1	17	2

Departmental Budget for Fiscal Year 1990-1991 (Salaries and Operations)

Two columns are shown for research dollars. Column 1 includes research dollars generated by faculty included in the Primary Faculty category (n = 1,436), page 75, even if those dollars are not

administered through the unit. This number is used to calculate research dollars per square foot of research space. In column 2 research dollars is included for all faculty for whom this is the academic home (n = 1,760) even if their outside research grants are administered through another unit, e.g., a center. This number is used to calculate research dollars per FTE.

Mean values only	Column 1	Column 2
Institutional	936,861	975,040
Outside Research Grants (Direct Costs Only)	1,587,624	1,784,221
Training Grants (Direct Costs Only)	191,060	180,850
Other Budget Support (Identify below)	174,715	169,896
Total	2,702,942	2,691,648

Percent of total faculty salaries supported by research grants (not to include fringe benefits costs). 24.77%

Ninety departments reported some faculty salaries from research grants, 2 departments did not respond, and 21 departments reported 0. Of the 90 departments reporting some salary, the min is 1% and the max is 77.10%.

Current fringe benefit rate most frequently used for primary, full time faculty. 24.82%

min 8.90% max 61% 4 departments not reporting

Percentage of departmental salary savings returned directly to department. 39.22%

range 0-100% 12 departments not reporting

Percentage of indirect returned to your department? 11.78%

range 0-100% 12 departments not reporting

Space

Research & Administrative Space	Square Feet Assigned to Dept. Mean Values	Square Feet Occupied and/or Used Mean Values
Research	12,235	11,850
Faculty Office Space	2,466	2,375
Pre- and postdoctoral trainees and laboratory support staff	1,285	1,434
Shared equipment	1,376	1,117
Storage	596	553
Administrative offices	1,059	1,127
Other (Specify)	1,499	1,866
Total Teaching Space		
Teaching laboratories	3,104	
Lecture halls	2,873	

Future Meetings

1991

APS Conference: From Channels to Cross Bridges — July 13-16, Bar Harbor, ME

APS Conference: Interactions of the Endocrine and Cardiovascular Systems in Health and Disease — September 29-October 3, San Antonio, TX

1992

FASEB Spring Meeting — April 5-10, Anaheim, CA

APS Conference: Integrative Biology of Exercise — September 23-26, Colorado Springs, CO

APS Conference: The Cellular and Molecular Biology of Membrane Transport — November 4-10, Orlando, FL

1993

FASEB Spring Meeting — March 28-April 1, New Orleans, LA

1994

FASEB Spring Meeting — April 24-29, Anaheim, CA

PETA Tries To Block Mercy Killings While Killing "Rescued" Animals

The Montgomery (MD) Journal reported that PETA (People for the Ethical Treatment of Animals) had euthanized 32 rabbits and roosters it had rescued from supposedly inhumane conditions and in its same-day editions also reported how PETA was petitioning the US Supreme Court to prevent the euthanasia of two Silver Spring monkeys whose physical conditions had deteriorated to where they were in constant pain and suffering.

Ingrid Newkirk, PETA's executive director, was quoted as saying that killing animals for reasons considered to be merciful in consistent with the animal rights philosophy. If the rabbits had not been killed they would have been "slaughtered for meat," experimented upon in laboratories, or "stuck in a hutch" and bred. "Euthanasia beats the socks off of those options in my mind."

It also was reported that she saw no inconsistency between PETA's opposition to the euthansia of the Silver Spring monkeys and its own euthanasia of the rabbits and roosters.

The reason given for the killing of the 32 rescued animals was that there was not enough room for them at the organization's three-acre animal sanctuary near Silver Spring, MD.

Peter J. Gerone, director of the Delta Regional Primate Center where the remaining Silver Spring monkeys are housed, accused PETA of a double standard, adding: "With the $10 million that they (PETA) brought in last year in revenue, they couldn't build some hutches for some rabbits to keep them alive?"

PETA rescued the rabbits from an intermediate school animal husbandry project in Montgomery County, MD, because of alleged charged that the animals were kept in small cages and were not properly fed. The roosters were taken from a home where they allegedly were used in Satanic cult rituals.

More States Enact Break-in Legislation; Congress, Other States Considering Same

Six state general assemblies have enacted research facility protection laws this year and seven other states and the US Congress are considering similar legislative initiatives.

The six states enacting facility protection laws are Arkansas, Montana, North Dakota, Oklahoma, Texas, and Washington, bringing to a total of 18 the number of states having laws on their books protecting research facilities from break-in, theft, and vandalism by animal activists. The seven states considering such legislation are Iowa, Nebraska, New York, North Carolina, Pennsylvania, Rhode Island, and Wisconsin.

In the Congress two bills are under consideration and a third facility protection bill is expected to be introduced this summer.

Sen. Howell Heflin (D-AL) introduced S.544, "The Animal Research Facility Protection Act of 1991," which would make it a federal offense to break into a research facility or to steal, destroy, or make unauthorized use of research animals, equipment, or data. The bill is identical to the legislation Heflin sponsored in the previous Congress. Although that bill received unanimous approval by the Senate, it failed to be heard by the House.

Rep. Henry Waxman (D-CA) is sponsoring legislation as an amendment to H.R.1532, the "National Institutes of Health Revitalization Amendments of 1991," which is the reauthorization bill for NIH programs. Waxman's proposal,

APS Played An Early Role In Promoting Break-in Laws

similar in scope to Heflin's bill, is limited, however, to protecting only those animal facilities receiving funding from the Public Health Service. The bill also is identical to the legislation Waxman introduced in the last Congress, which never was reported out of committee.

A third bill, to be sponsored by Rep. Charles Stenholm (D-TX), is to be introduced sometime this summer. The bill is expected to be similar to the legislation he sponsored in the last Congress, which had majority support in the House but died when it became sidetracked by committee rules at the close of the 101st Congress.

All of the bills – state and federal – were initiated by the legislative bodies because of raids by animal activists on several dozen of the nation's research facilities, costing taxpayers millions of dollars to replace damaged facilities and equipment, stolen animals, and to restart research projects.

In addition to the five states enacting legislation so far this year, the other states to pass such laws since the summer of 1988 are Arizona, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, and Utah.

Of the recently approved state laws Montana enacted one of the toughest penalty codes in the nation with fines ranging from 1500 to $50,000, prison terms up to 10 years, and granting to the victims the right to seek payment from the guilty party of up to three times all actual and consequential damages. The North

Dakota law also permits the victim to seek payment from the guilty party of up to three times actual and consequential damages plus court costs.

The Arkansas law penalty requires the guilty party to make full restitution to the facility for the cost to replace materials, data, equipment, animals, and records along with the costs for repeating any research that was interrupted or invalidated.

W. M. Samuels

APS Initiated Push for Break-in Laws

With half of the 50 states having either passed or actively considering research facility protection legislation plus both houses of Congress considering a national law to protect animal research laboratories, it has become evident that society has made the statement that it no longer tolerates vandalism by animal activists.

Legislative initiatives on any issue are the result of constituent pressures, and the swing within the past 36 months toward enacting facility protection laws is evidence that voters from the grassroots districts have spoken in a clear voice to their elected members in the general assemblies and in Congress.

Not only have 17 states enacted facility protection acts (plus eight states where such bills are pending), but Congress last year came within a whisker of enacting a national break-in bill, losing the race with the clock at the time of adjournment.

The seeds for a national law making break-ins at research institutions a federal offense were planted by APS in 1984 in testimony before a House subcommittee.

Testifying at the hearing on the "Improved Standards for Laboratory Animals Act," a bill that would amend the Animal Welfare Act, APS President **Walter Randall** told the House Agriculture Subcommittee on Department Operations, Research, and Foreign Agriculture:

"The Society would like to offer to the Subcommittee an amendment to the Animal Welfare Act which was proposed at the annual meeting of the (APS) membership last month and has been unanimously endorsed by the Society's governing board.

"The basis for this proposed amendment is the recent criminal events at more than a dozen federally supported research institutions where laboratories were trashed, equipment vandalized, research data destroyed, and animals stolen. Such actions have caused the loss of untold millions of federal dollars and a waste of incalculable numbers of scientific man hours of work. Each of the projects which were interrupted by such actions will have to be re-started with the expense being borne by the federal government. It is especially ironic that these actions also double the animal usage for the research.

"The Society urges the Congress to add a provision to the Animal Welfare Act authorizing federal prosecution of those persons involved either directly or indirectly in the interference with federally funded research by the destruction and/or theft or equipment, animals, or data materials as well as the prosecution of those persons who obtain such stolen equipment, animals, or data materials.

"Those who are convicted of such offenses should be held liable for both punitive damages and the cost of replacing materials, data, equipment, animals, or records which may have been damaged or cannot be returned as well as the

(continued on p. 82)

Meanwhile, the Supreme Court denied by an 8-0 vote PETA's petition to prohibit the euthanasia of the two Silver Spring monkeys. The monkeys—Titus and Allen—were placed under deep anesthesia and electrophysiological measurements were made from a small area near the brain surface just before death. It is expected that this brain mapping will yield information about the reorganization of brain function following long-term deafferentation, which may lead to improved rehabilitation therapy for victims of stroke or spinal cord injuries.

In the Congress, Rep. Vin Weber (R-MN) said, "If mercy killing is truly consistent with the animal rights philosophy, why the fanatical opposition to the killing of the Silver Spring monkeys for the very same reason?

W. C. Randall

"For 10 years PETA has forced the government to spend millions to keep these monkeys alive and is now tying up the Supreme Court to protect them. Could it be that the monkeys are too valuable of a fund raising tool for PETA to give up? I have always questioned the movement's sincerity. This recent behavior shows that their only concern is their own radical agenda, not the animals they supposedly defend."

Weber is the founder of the House Animal Welfare Caucus.

BREAK-IN LAWS

(continued from p. 81)

cost for repeating the experiments that have been interrupted or invalidated.

"Most federally supported research institutions are looking to the Congress to provide the support needed to halt the increasing number of incidents of attack that go beyond the limits of civil demonstrations. The scientific community will work closely with the Congress to develop adequate provisions that would stem this unnecessary burden for the researchers and this inexcusable waste of monies the Congress appropriates for biomedical research and the loss of animal lives."

The APS proposal was endorsed by both the Association of American Medical Colleges and the National Society for Medical Research and was berated by the animal welfare organizations.

The following year Rep. George E. Brown, Jr., (D-CA) introduced a break-in bill patterned after the APS proposal after the Animal Liberation Front had raided and caused major destruction to a large university research facility in Brown's home district. Although the bill was never brought to the floor of the House, there also were no further raids on research laboratories until a few days after that Congress had adjourned 19 months later.

As the raids continued states began to take action, with Massachusetts in the summer of 1988 being the first state to enact legislation specifically aimed at protecting animal research facilities from raids by animal activists. Since then 16 other states have enacted similar legislation.

APS Tells Senate, House Committees of Funding Needs for Physiologists

The American Physiological Society told two Congressional appropriations panels that more funding should be spent on training scientists who can perform integrative studies on intact organisms and that funding of investigator-initiated research grants should be funded at a 30 percent level in fiscal year 1992.

Martin Frank, APS executive director, testified before both the Senate and House Appropriations Subcommittees on Labor, Health and Human Services, Education, and Related Agencies during public hearings on next year's funding levels for the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration.

"As more and more is being learned about molecular details of cellular elements, it becomes increasingly clear that such information needs to be integrated into cellular, tissue, and organ functions," Frank said. "Universities and pharmaceutical companies are unable to find adequate numbers of scientists trained to perform integrative studies on intact organisms. Without physiologists, pathologists, and clinical investigators the new molecules discovered by the molecular biologist cannot be related to overall body functions.

"It is, therefore, imperative that training programs be included in the appropriations bill to develop the pool of investigators who can translate discoveries at the molecular level to cellular and organ physiology and into clinical application."

Frank also urged the Congress to take appropriate action this year to assure that investigator-initiated research project grants are expanded by funding at least 30 percent of the eligible applications in each of the next five years.

For fiscal year 1992 the 30 percent funding mark would provide 6,143 new awards. The administration had set an award mark at 5,785.

Copies of the APS testimony are available from the APS National Office.

AAMC Survey Reveals Costs of Animal Activities In US

All 126 medical schools responded to an Association of American Medical Colleges (AAMC) survey designed to assess the cost of activities of animal activists, the frequency and types of harassments aimed at faculty and staff, and the degree to which educational programs for medical students have been affected over the past five years.

Seventy-six schools reported damages or other losses totaling in excess of $2.2 million as a direct result of demonstrations, break-ins, vandalism, and other disruptive incidents. Activist-precipitated construction delays and installation of security systems have cost schools another $6.8 million.

The schools estimated that current annual ongoing expenses aproach $17.5 million to meet security needs, increased costs in the purchase of animals, and compliance with new animal care regulations.

A wide variety of harassments of faculty and staff, ranging from bomb and death threats to picketing family homes, were cited. Approximately 3,800 cases of harassment were reported during the five-year period.

Contrary to claims by animal activists that most medical schools no longer use live animals in education, the survey disclosed that 92 schools still use live animals in instruction. This is about the same number of schools that reported using live animals in the 1985 AAMC survey. Of the schools reporting the use of live animals for instruction, 61 said that alternative exercises are available for those students who object. About 95 percent of all medical students participate in instructional programs in which live animals are used, according to the survey.

Responses to the Long Range Planning Committee Report

To Ernst Knobil, Chairman:

This letter was an impromptu reaction for the committee chairman's personal digestion. It was later considered proper to have it published as it was written, with only minor editing.

Undoubtedly some decades have vanished since we both spent interesting times at Harvard with Gene Landis and John Pappenheimer and Cliff Barger; actually I still have very close contacts with the two latter gentlemen on a more personal basis.

However, this letter is rather about a supporting HURRAH for what is written in *The Physiologist* (33: p.161-171, 1990) under the title "What's Past is Prologue" – and it was really not a moment too early! It has for me been almost incredible how fashion and bandwagon attitudes also pester the scientific community, to such an extent that one almost feels ashamed for many colleagues, both for lack of foresight and deeper understanding and also for lack of courage and ability to "stick to one's guns." The real nadir for me was when I noticed that quite a few universities and chairmen of old honourable physiology departments were even ashamed to *be* "physiologists" and in a me-too attitude perverted the names of their departments. Really disgraceful! Even worse, the scientific-bureaucratic establishments (like NIH, but also that of other countries) are also running with a temporary "tidewater," evidently not understanding that the *real* difficulties, beauties, *and* finally the most important secrets in biology are hidden in the higher levels of integration, i.e., in how mind and body talk to each other and form a unit of the most fantastic complexity. Instead, they put all the money and effort in collecting and defining "nuts and bolts," not understanding that they remain a heap of sophisticated junk if no one is around to use them to build an airplane *and* make it airborne. To me *real* physiology is "to make things airborne, which, of course, does *not* deny that all the nuts and bolts must be around to put the machinery together. The obvious risks are, of course, that if all money is directed toward the nut-and-bolt levels, its seeming glamour will also attract young talent, the more so as it is usually far easier to publish acceptable papers in molecular biology than on, e.g., the psychophysiology of "emotional" neurohormonal adjustments of body and mind. Talent in classical physiology in the USA threatens to die out if the tide is not turned soon. What is lost in a decade of shortsighted misplanning can be extremely difficult to repair if one has also lost ten years of talent recruitment *and* a number of skillful old foxes have gone into retirement.

So, it was really *high time* to bang the fist on the table so that glasses and glass owners jump in the air – WELL DONE, Mr. Chairman! But don't lose the grip – you have to push on and on and on. All channels and modes of action should be used. I have asked John Shepherd to invite a number of salty articles for *NIPS* on these issues (written by "real" physiologists of high reputation).

A word about terminology. You suggest the term "integrative biology," and I agree to the word "integrative" in this very context, because this is the essence of physiological ways of thinking and what it is all about. However, the word "biology" – fine as it is – almost stinks to me after abuses like "molecular biology" and "cellular biology" have become status words in some circles and therefore have been almost eroded. Why not "integrative physiology" – the old honourable term "physiology" has impressive traditions and has made men like Claude Bernard, Carl Ludwig, Ernest Starling, Charles Sherrington, Adrian Barcroft, and the like proud of their discipline. Why should we, in these days of word erosion and idiotic "newspeak," abandon old traditions – *inherent* in the word "physiology" *is* that it deals with living matter. So why not "integrative physiology"?

But, such things apart, your actions are to be praised. Continue to raise hell, both at meetings, in articles, in committee work, and *above all* in confrontations with NIH, where the bureaucratic-infested circles evidently are blind to the fact that *biology* stretches from molecules *up to and including* the body-mind interactions in *Homo sapiens* in his brave new world.

So: GET GOING!

Björn Folkow
Emeritus Professor
Department of Physiology
University of Göteberg

To Ernst Knobil, Chairman:

Thank you for the well-developed Long Range Planning Committee Report. As Departments of Physiology and their Chairs struggle with their identity and purpose (I was tempted to use "function"), it will be helpful. "Integrative biology" indeed!

To some extent, it seems that you missed the boat. Physiology is rather well defined. See citations from an old (1920) and modern dictionary:

> "*Physiology* 2. The branch of biology dealing with the processes, activities and phenomena incidental to and characteristic of life or of living organisms; the study of the functions of organs and parts during life, as distinct from anatomy which deals with their structure. These processes and phenomena include many that are chemical, physical and mechanical, as well as others apparently of a peculiar nature; those that are purely mental are, however, not included in the ordinary scope of physiology." (*Webster's New International Dictionary.* G. C. Merriam Co.; 1920.)

> "*Physiology* 1: a branch of biology that deals with the functions and activities of life or of living matter (as organs, tissues or cells) and of the physical and chemical phenomena involved – compare ANATOMY." (*Webster's Ninth New Collegiate Dictionary.* Springfield, MS: Merriam-Webster Inc.; 1984.)

All "functional biologists" are physiologists. The problem is to find a *unique* niche for those who would be members of the APS and Departments of Physiology. "We" may have missed the "last revolution in biology," but physiology did not. We might wish that the biochemists, biophysicists, bioengineers, neuroscientists, molecular biologists, etc., etc., were still under the umbrella, but they are not. Considering the complexity of biology as even now understood, no one should expect that one professional society can satisfy the needs of such a diverse set of disciplines. My concern is that the APS and the Departments of Physiology not become dinosaurs. Physiology is in great shape.

To place the emphasis on "integrative biology" is laudatory. For our leaders to recognize that there is more to be learned about "organ physiology" and "systems physiology," as exemplified by "integrative biology," would be welcome indeed. As the late Fred Grodins stated in 1954: "The essence of physiology is regulation. It is this concern with the 'purposeful' system responses which distinguishes physiology from biophysics and biochemistry. Thus, physiologists study the regulation of breathing, of cardiac output, of blood pressure, of water balance, of body temperature and a host of other biological phenomena." (Grodins et al. *J. Appl. Physiol.* 7: 283–308, 1954). I used the quotation in five editions of E. E. Selkurt's *Physiology* and continue to find it definitive.

Carl F. Rothe
Professor
Indiana University

Reply:

Thanks for your letter of 25 January 1991 regarding the APS LRPC report. Beyond your statement that we "missed the boat" I fail to see any conflict between the contents of your letter and those of the White Paper which discusses your definition of physiology, among others, at great length. I confess, however, that we did not have the perspicacity to seek the wisdom of either the 1920 edition of *Webster's New International Dictionary* or of the *Webster's New Collegiate Dictionary* of 1984.

Ernst Knobil

To Gerhard Giebisch, Committee Member:

I read with interest the LRPC report in the recent APS newsletter. I feel that the committee has taken command of the situation and has recommended a plausible road to follow for the APS with regard to its interactions with FASEB. For that I'm very grateful as a member of the society. On the other hand, I'm afraid I don't feel as optimistic as the article suggests we should be. I feel Physiology as a discipline is dying at a very rapid rate. Even the isolated term conjures up a feeling of sadness and loss. I'm not that much more enthusiastic about the phrase, "integrative biology." It sounds as though you really are not modernizing the society to deal with the scientific revolution at hand but trying to make the old immovable guard happy. It gives the impression that the terminology will be new, but otherwise it will be the same old thing. And that same old thing is not getting grants now.

What about a fresh, new start? Your department uses the terminology cellular and molecular physiology. To deal with the integrative aspect the committee is suggesting, why not consider something like building a society around molecular and integrative physiology (ASMIP)?

As bold as the committee has been, perhaps it must be even bolder in order to successfully take us into the next decade.

Diana Marver
Associate Professor of Internal Medicine
University of Texas at Dallas

Perspectives in Exercise Science and Sports Medicine, Vol. 3: Fluid Homeostasis During Exercise

C. V. Gisolfi and D. R. Lamb (editors)
Carmel, IN: Benchmark Press, 1990, 459 pp., illus., index, $45.00.

The changes in the volume and composition of the body fluid compartments during exercise and the cardiovascular responses to these changes, to the demands of the exercising muscles, and to the need to dissipate the heat generated by the exercise represent an intriguing and challenging physiological problem. The magnitude of the physiological challenge is greatly enhanced when the exercise is carried out in a hot environment. Indeed, under circumstances in which heavy sweating occurs, water loss from the body can exceed 1.8 L/h. From a practical point of view, this is a problem that people face in activities that range from carrying out military operations in a hot humid jungle or a hot arid desert to engaging in a run for fun.

Both water and solute, mostly NaCl, are lost from the body during exercise, but the loss of the former is greater than the loss of the latter because sweat is a hypotonic solution. Thus, water is lost from all of the body fluid compartments. Homeostatic mechanisms come into play to maintain blood volume. The cardiovascular system is faced with the problem of, on the one hand, providing adequate blood flow to the exercising muscles and, on the other hand, maintaining cutaneous blood flow so that heat can be dissipated. Indeed, dehydration impairs performance and the ability to dissipate heat. The physiologist is faced with the task of understanding the homeostatic mechanisms that come into play to meet these needs and determining the steps that can be taken to maintain optimal exercise performance and to protect the individual from the deleterious consequences of dehydration that could culminate, in the extreme, in death from heat stroke.

The goal of this book is to "consolidate in one volume the physiology of fluid consumption, balance, and control" in response to exercise and environmental stress. To accomplish this the editors have assembled a group of experts to participate in a colloquiem on the subject. The chapters in this book are based on the presentations at the colloquiem. Each chapter concludes with a brief summary and is followed by what is apparently a transcription of the discussion that followed the presentation. The summaries are useful, and the discussions can be instructive, particularly when they highlight areas of controversy.

Several chapters deal with the changes in the volume and composition of the body fluid compartments, the cardiovascular responses to exercise, and the effects of added heat stress on these responses. There are chapters on the hormonal regulation of the body fluids, the role of the kidney as an excretory and as an endocrine organ, and an excellent chapter on the participation of the nervous system in body fluid homeostasis. One chapter deals with the effects of acceleration and weightlessness on body fluid and cardiovascular regulation. Because of the deleterious effects of dehydration on exercise performance and on heat tolerance, a recurrent topic in this book is the issue of rehydration. The specific questions are when the fluid should be given, the optimal composition of the rehydrating fluid with respect to electrolytes and carbohydrate, and the volume of the rehydrating solution. In this context there are also chapters on gastric emptying and intestinal absorption of fluids during exercise. In the final discussion section, there is an effort to reach an agreement on the formulation of an oral rehydrating solution to be used during prolonged exercise in a warm environment, but it is not clear that this agreement was reached. There is a final chapter on the clinical implications of heat-related disorders and the management of exertional heat stroke.

The individual chapters are generally well written, and I found this to be an enjoyable book to read. Since each chapter was written by separate authors, there is some duplication. Several topics are only superfically covered, undoubtedly because of space restrictions. These very slight limitations are more than compensated for by the expertise of the presentations. This book will be of value to students and researchers in exercise physiology and, indeed, to anyone with an interest in water and electrolyte homeostasis.

Leonard Share
Department of Physiology and Biophysics
University of Tennessee

BOOKS RECEIVED

Respiratory Distress Syndromes: Molecules to Man. Kenneth L. Brigham and Mildred T. Stahlman (Editors). Nashville, TN: Vanderbilt University Press, 1990, 290 pp., illus., index, $49.50.

Molecular and Clinical Advances in Pituitary Disorders. Shlomo Melmed and Richard J. Robbins (Editors). *Current Issues in Endocrinology and Metabolism.* Jerome M. Hershman (Editor). Cambridge, MA: Blackwell Scientific Publications, 1991, 300 pp., illus., index, $59.95.

Hypoxia: The Tolerable Limits. John R. Sutton, Charles S. Houston, and Geoffrey Coates (Editors). Indianapolis, IN: Benchmark Press, Inc., 1988, 388 pp., illus., index, $48.00.

Human Performance Physiology and Environmental Medicine at Terrestrial Extremes. Kent B. Pandolf, Michael N. Sawka, and Richard R. Gonzalez (Editors). Indianapolis, IN: Benchmark Press, Inc., 1988, 637 pp., illus., index, $48.00.

Perspectives in Exercise Science and Sports Medicine, Vol. 1: Prolonged Exercise. David R. Lamb and Robert Murray (Editors). Indianapolis, IN: Benchmark Press, Inc., 1988, 494 pp., illus., index, $35.00.

Perspectives in Exercise Science and Sports Medicine, Vol. 2: Youth, Exercise, and Sport. Carl V. Gisolfi and David R. Lamb (Editors). Indianapolis, IN: Benchmark Press, Inc., 1989, 590 pp., illus., index, $40.00.

Pathophysiology of Head and Neck Musculoskeletal Disorders. M. Bergamini and S. Prayer Galletti (Editors). *Frontiers of Oral Physiology, Vol. 7.* D. B. Ferguson (Editor). Basel, Karger, 1990, 220 pp., illus., index, $178.00.

Neurobiology of Cognition. Peter D. Eimas and Albert M. Galaburda. Cambridge, MA: The MIT Press, 1990, 250 pp., illus., index, $22.50.

New Ideas on the Structure of the Nervous System in Man and Vertebrates. Santiago Ramon y Cajal. (Transl. by Neely Swanson and Larry W. Swanson). Cambridge, MA: The MIT Press, 1991, 201 pp., illus., index, $29.95.

Hormones: From Molecules to Disease. Etienne-Emile Baulieu and Paul A. Kelly (Editors). New York: Chapman and Hall, 1990, 697 pp., illus., index, $62.50.

Cardiovascular Pharmacology. Third Edition. Michael J. Antonaccio (Editor). New York: Raven Press, 1990, 556 pp., illus., index, $75.00.

Formerly at the Yale University School of Medicine, **Mark D. Okusa** is now at the University of Virginia, Division of Nephrology, Charlottesville.

Marvin J. McBroom has joined the Department of Physiology, United Arab Emirates University, Al-Ain, U.A.E. A member since 1976, McBroom was on the Faculty of Medicine, University of Kuwait.

Formerly at the Chicago West Side VA Hospital, **Zvi Talor** has moved to the VA Medical Center in Ashville, NC.

APS member, **David Combs,** University of Kentucky, has accepted a position as Science Curator at the California Museum of Science and Industry, Los Angeles.

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.

Robert L. Post of the Vanderbilt Medical School, has joined the Department of Physiology, University of Pennsylvania, Philadelphia.

POSITIONS AVAILABLE

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.

Postdoctoral Position. The Department of Physiology and Biophysics at the University of Nebraska Medical Center has an opening available August 1, 1991, for PhD/MD in cardiovascular/respiratory physiology. This research program will emphasize neurohumoral mechanisms in heart failure and lung disease. Experience with hemodynamic or pulmonary function measurements preferred. Salary range from $20,000–$25,000 depending on experience and qualifications. Applicants should send a curriculum vitae and three letters of reference by July 1, 1991 to: Dr. Harold Schultz, Department of Physiology and Biophysics, University of Nebraska Medical Center, 600 South 42nd Street, Omaha, NE 68198-4575. EOAAE.

Biophysics/Neurophysiology Tenure Track Faculty Position. The Institute of Neurobiology of the University of Puerto Rico Medical Sciences Campus, an interdisciplinary research institute, seeks a cellular neurophysiologist or biophysicist interested in studying the nervous system of tropical terrestrial or marine invertebrates or lower vertebrates. The appointment will be at the level of Assistant or Associate Professor. Limited teaching to graduate students and in a relevant medical school department in Spanish or English. Send a curriculum vitae, recent reprints, and the names of three references to Dr. Conchita Zuazaga, Institute of Neurobiology, 201 Blvd. del Valle, Old San Juan PR 00901. EOAAE.

Research Assistant (non-tenure track) to conduct research into autonomic cardiovascular control mechanisms in healthy subjects (including astronauts in space) and patients with cardiovascular diseases. Must have PhD in physiology or bioengineering and at least two years research with human subjects. Position involves substantial travel. Experience working in culturally diverse setting is preferred. Virginia Commonwealth University is an equal opportunity affirmative action employer; women and minorities are encouraged to apply. Applicant review will continue until position is filled. Send resume to Dr. Dwain L. Eckberg, VA Medical Center, 1201 Broad Rock Blvd., Richmond, VA 23249.

SENIOR PHYSIOLOGISTS

(continued from p. 66)

posure to respiratory physiology under Cournand and Richards in the early '40s. Fortunately, I am now able to collaborate with Edward A. Nardell, M.D., who, at Harvard and the Massachusetts Department of Health, is very active in tuberculosis control.

"In practical terms we are pushing use of a booth, vented through a HEPA filter, for performing cough producing procedures such as sputum induction or aerosolized pentamidine administration. We also are pushing ultraviolet air disinfection since this is several times more effective than feasible levels of ventilation with fresh air. CDC in Atlanta is now sponsoring both of these approaches to controlling airborne infection. My current effort is in pulling together evidence that germicidal UV tubes, which radiate predominantly in the 254 nm wavelength, are much safer than generally believed. This wave-length radiation has virtually no capacity to penetrate skin or even the eye. While overdose gives superficial inflammation, I am convinced that the danger of cataracts or skin cancer is negligible. The evidence for these hazards comes from longer wave-length UV, including sunlight.

Letters to Helen M. Tepperman

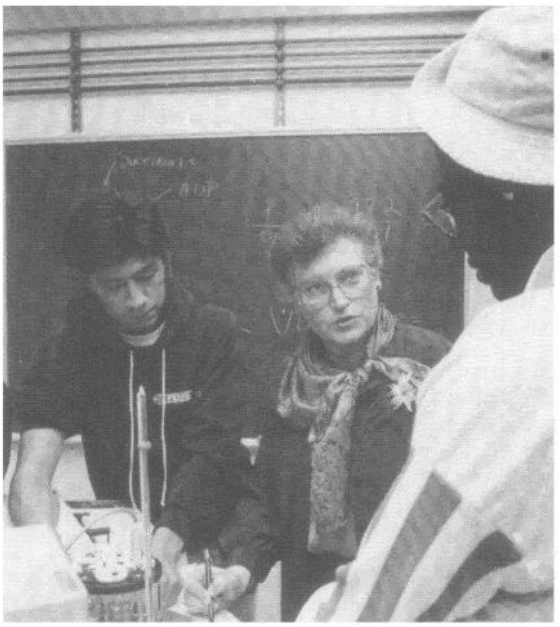
"I am as healthy as can be expected at age 92, except for a crippling arthritis," **C. Beecher Weld** reports from Halifax, Nova Scotia. "I retired from Dalhousie University at age 70, the last years being chiefly administration. I was weary and glad to leave. I have had no retirement problems. My wife and I have done a good deal of volunteer work. We have traveled a lot. We have a largish, caring, extended family. We are both passable artists. My wife has been for years, but I only began at age 55. It is a serious study and the ability to sketch one's travels adds greatly to their interest. Without a serious interest outside of your work, retirement could be bleak."

Horwitz Awarded A Teaching Prize

Barbara A. Horwitz, an internationally recognized University of California, Davis, animal physiologist known as a prolific scientist and an outstanding teacher, has been awarded the 1991 UC Davis Prize for Teaching and Scholarly Achievement—a $25,000 award, believed to be the largest of its kind in the country.

Established by the Cal Aggie Foundation, the prize pays tribute to faculty members who demonstrate throughout their academic careers a dedication to the skillful teaching of undergraduates as well as to the production of valuable scholarly accomplishments.

During the past 20 years, almost 6,000 undergraduates have passed through Horwitz's cell physiology classes, where they learn about the biological machinery that drives the survival growth and reproduction of cells. Her students say they



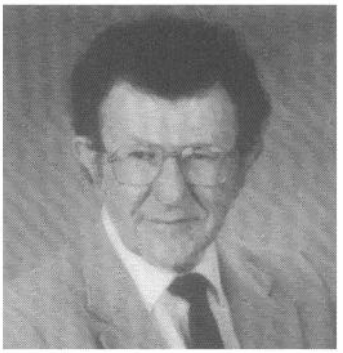
appreciate her clear presentations of complex material and her ability to make research come alive in lecture classes.

In her research, Horwitz studies the hormonal, neural, and genetic factors that control specific metabolic processes. Much of her work focuses on brown adipose tissue, a type of fat that is important to keeping newborn mammals, including humans, warm and for providing the heat needed to arouse hibernating mammals from dormancy.

In a current project, Horwitz and her students are investigating young obese and lean rats in the hopes of identifying mechanisms that predispose certain adult rats to obesity. Horwitz also has recently begun a study of the molecular basis of hibernation.

In addition to teaching and research, she reviews articles for a variety of journals, including the *American Journal of Physiology.* She has served on many APS committees since she became a member in 1969 and is presently a member of the Society's Education Committee.

Spector Receives Three Major Awards



Novera Herbert Spector, Health Scientist Administrator in the Fundamental Neurosciences Program of the National Institutes of Health, was the recipient of three major honors within the past year.

The first Sergei Metalnikov Gold Medal was presented to Spector at the opening session of the Congress of the International Society for Neuroimmunomodulation (ISNIM) in Florence, Italy, May 24, 1990. He was cited for his service as first president of the ISNIM, for his outstanding research, and for his numerous seminal ideas leading to an explosion of new fundamental research in neuroimmunomodulation. This term was coined by Spector, 12 years ago, to describe interactions among the nervous, immune, and endocrine systems.

At its October 1990 meeting in Krakow, the Polish Physiology Society honored Spector with a medal commemorating the Society's hundredth anniversary and for his role as principal founder of the ISNIM.

The Director's Award, NIH's highest honor, was presented to Spector, June 27, 1990, by Acting Director William Raub for his highly effective performance in fostering research in the field of nervous system–immune system interactions. Largely due to his prodding, as well as his pioneering research and heroic educational efforts, funded support for research related to interactions among the nervous, endocrine, and immune systems has grown at NIH and NIMH to more than 200 grants in less than 10 years.

Spector, a member of the Society since 1970, serves as editor of several journals, as well as an adjunct professor of microbiology and neurosciences at the University of Alabama and adjunct professor of physiology and biophysics at Georgetown University Medical Center.

Gravitational Physiology Proceedings

The Proceedings of the 12th Annual Meeting of the IUPS Commission on Gravitational Physiology, published in *The Physiologist* 34:1, 1991, are available to APS members upon request.

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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Scientific Meetings and Congresses

Sensing and Controlling Motion; Vestibular and Sensorimotor, Mountain View, CA, July 7-11, 1991. *Information:* Marketing Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY, 10021. Tel: 212-838-0230.

IBRO Congress, Montreal, Canada, August 4-9, 1991. *Information:* 3rd IBRO World Congress of Neuroscience, c/o Receptour International, P.O. Box 1356, Station B, Montreal, Quebec, Canada H3B 3K7.

19th International Society on Oxygen Transport to Tissue (ISOTT) Meeting, Curacao, Netherlands Antilles, August 24-31, 1991. *Information:* Ms. Denise Haas, Department of Anesthesiology, Erasmus University Hospital, Dr. Molewaterplein 40, 3015 GD Rotterdam, The Netherlands. Tel: 31-10-4633458, Fax: 31-10-4633722.

Fifth World Congress for Microcirculation, Louisville, KY, August 31-September 5, 1991. *Information:* Patrick D. Harris, PhD, Fifth World Congress for Microcirculation, University of Lousiville, Louisville, KY 40292. Tel: 1-502-588-5373, Fax: 1-502-588-6239.

Sensory Transduction, Woods Hole, MA, September 5-8, 1991. *Information:* Society of General Physiologists, P.O. Box 257, Woods Hole, MA 02543.

Founding Congress of the World Federation of Sleep Research Societies, Palais des Festivals et des Congrès, Cannes, France, September 21-25, 1991. *Information:* Ms. Judy Franzblau, Global Events, 279 S. Beverly Drive, #1165, Beverly Hills, CA 902312. Tel: 213-247-8004, Fax: 213-273-6159.

Aging and Cellular Defense Mechanisms, Grand Hotel Raffaello, Modena, Italy, September 22-26, 1991. *Information:* Marketing Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021, Tel: 212-838-0230.

8th International Congress of Human Genetics, Washington, DC, October 6-11, 1991. *Information:* ICHG Management Office, 9650 Rockville Pike, Bethesda, MD 20814-3998. Tel: 301-530-7010.

Conference on Humane Aspects of Primate Models in Neurological Disorders, Bethesda, MD, October 11, 1991. *Information:* Conferences, SCAW, 4805 St. Elmo Avenue, Bethesda, MD 20814. Tel: 301-654-6390, Fax: 301-907-3993.

Fall Meeting of the Biomedical Engineering Society, Charlottesville, VA, October 12-14, 1991. *Information:* BMES, P.O. Box 2399, Culver City, CA 90231. Tel: 213-618-9322, Fax: 213-618-1333.

Plasminogen Activation in Fibrinolysis in Tissue Remodelling and Development, Leiden, The Netherlands, October 22-25, 1991. *Information:* Marketing Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021. Tel: 212-838-0230, Fax: 212-888-2894.

Rosaline Borison Memorial Fund

Herbert L. Borison, professor of pharmacology at Dartmouth Medical School since 1962 and a leading authority on the reflex center in the brain that stimulates vomiting, died in Hanover on December 6, 1990. Contributions may be made to the Rosaline Borison Memorial Fund at Dartmouth Medical School, which he established anonymously in 1984 in memory of his wife.