

# The Public's View of Federal Support for Medical Research

### Mary Woolley President

### **Research!America**

Good morning. Even as we gather, the Clintons are preparing for their historic bus ride from Monticello to Washington, DC.

I have been thinking lately of the campaign bus as a metaphor for a populist administration; a populist administration that is determined to "look like America." I think we would all be well-advised to consider how fundamentally nonpopulist is the conduct and image of science—in fact, one of my take-home messages this morning is to urge you all, metaphorically speaking, to get on the bus . . . to get out of the ivory tower . . . to get involved in campaigning for science by talking not to each other but to people on your bus

An address presented at the winter meeting of the Association of Chairs of Departments of Physiology and the Association for Medical School Pharmacology, Stuart, Florida, January 16, 1993.

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route: by making the case for research to the person sitting next to you on your next plane flight, or to the person sitting next to you in the bleachers during your son's next basketball game, or to your next-door neighbor, or to your congressman, especially if she or he is a new congressman.

If this kind of campaigning for science/making friends for research activity sounds uncomfortably self-serving, you may be falling into one of two common traps: the "apologist" trap or the "elitist" trap. Research!America board member Ted Cooper, the Chairman and CEO of Upjohn, perhaps known to some of you from his days at the helm of NHLBI, often speaks out to members of the scientific community urging a change in attitude and rhetoric from apology to advocacy. I join him in encouraging you to talk about-and express pride in-the many accomplishments of research. And I encourage you not to be deterred from seeking additional support and funding. As he says, "Get in there and do battle-that's how this democracy works!" To Dr. Cooper's advice I would add the clarifying comment that advocacy is different from education-it is not neutral. That's why Research!America speaks of public education and advocacy.

If you've fallen into the elitist trap, you may believe, even if you wouldn't admit it, that the value and nobility of your work deserve unquestioning support from the nation. In this trap, one tends to think of the public as patrons rather than as partners. I thought I was using the term patron to overstate, for rhetorical effect, the elitist problem, but not so: the December PCAST report on research-intensive universities unfortunately uses the patron terminology repeatedly.

Washington University Chancellor William Danforth

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#### FEDERAL SUPPORT OF RESEARCH (continued from p. 53)

wrote recently that "American science is an elitist occupation in a nation with strong egalitarian traditions." I ask you, albeit rhetorically, to consider where we are most likely to see change in this equation. A nation that has repeatedly demanded removing the perks of public office as a preliminary to removing many of the public officers themselves is not a nation that will be long persuaded of a necessary elite class of scientists. Better that we should proceed a little faster learning how to move our enterprise into the mainstream egalitarian traditions people like Bill Clinton stand for. It's time for us to get on the bus!

As you gear up to get on the bus and talk to the public, it will hearten you to know that the public is already on your side, on the side of research. Despite what *Time* magazine and others contend, there is no basis I know of to support the proposition that there has been a swing in public opinion away from life-science research. My own theory as to why we do read about loss of public confidence is that an embarrassed scientific community, dis-

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Headquarters phone: 301-530-7118. Fax: 301-571-8305. mayed about the behavior of some of its own and unable to accept the fact that in any group there are both "some crooks and some jerks" (H. Schachman), is itself creating—or at least contributing to creating—an environment of loss of public confidence, when we should be accentuating the positive. We are apologizing when we should be advocating.

Let's talk positively. Let me give you some indicators of considerable support by the public for what you do. First, and this is nontrivial, consider the ubiquitous popular presence of the term research. It is the good housekeeping seal of approval for virtually everything that is advertised. Market research is a fact of life. Survey research is the basis for the polls we read and hear about constantly. And in a more substantive sense, research continues to be widely and correctly perceived by the public as the basis for wise decision-making-all kinds of everyday decision-making, ranging from consulting research in Consumer Reports about the best VCR to buy, or looking to research for help with decisions about choosing the best hospital or to reinforce a resolve to quit smoking or to use seatbelts. And research is also the basis for planning for the future: not some abstract, philosophical or humanitarian version of the future but each individual's own future and the future of his or her family and friends. The fact is that learning from and depending on research is an everyday part of everyday peoples' lives.

There is a tremendous amount of hope and confidence invested by the public in research and the practitioners of research. Joel Achenbach's "Why Things Are" column in the Washington Post puts it simply: "We have unlimited faith in medical science. Surely there is nothing that can't be figured out eventually, with enough money and gumption." Surgeon General Antonia

(continued on p. 74)

### A Matter of Opinion

# **Experimental Biology '93—Retrospective**

New Orleans served as the venue for the first of what should become a long series of Experimental Biology spring meetings. However, the basis for its development remains a mystery even to the members of the participating societies. Therefore, it is important to provide some additional information about the development of the format for this meeting.

In writing about Experimental Biology '93 in Science, John Travis exhibited the confusion experienced by many when he decided to ask the question "What's in a Name?". In part, his confusion resulted from a failure to consult with representatives of the societies that developed the new format for the FASEB meeting: American Physiological Society (APS), American Society for Pharmacology and Experimental Therapeutics (ASPET), American Society for Investigative Pathology (ASIP), American Institute of Nutrition (AIN), and American Association of Immunologists (AAI). Instead, he quoted Charles Hancock (not Haddock), American Society for Biochemistry and Molecular Biology: "It [the FASEB Meeting] was a monstrous meeting. When you have 15,000 people together and multiple concurrent topics, it's tough to choose sessions." While Hancock was not a participant in the discussions to develop the new format, his statement provides the reason why the Experimental Biology format was developed.

In restructuring the FASEB meeting, the participating societies attempted to preserve the strong aspects of the old meeting: specifically, a format that allowed for the presentation of a broad range of experimental biological research by some 8,000 to 12,000 scientists in conjunction with an extensive exhibit program. To reduce the intellectual conflicts that are apt to occur under such circumstances, the organizers identified eight cross-disciplinary research areas that would be amenable to programming by committees consisting of members of the participating societies. Each of the themes were then scheduled in contiguous rooms, creating eight separate meetings within the framework of the larger meeting.

This "meeting within a meeting" format was established to help recapture one aspect of the old days of the FASEB meeting in Atlantic City. Attendees would bump into their colleagues along the Boardwalk as they ran between sessions addressing either the physiological, pharmacological, biochemical, or pathological aspect of their biological process of interest. At Experimental Biology '93, the "meeting within a meeting" format enabled the attendees to meet their colleagues in the area of the convention center assigned to each of the themes. Those scientists who focused on a particular theme felt that this aspect of the meeting worked very well.

The themes that made up the "meeting within a meeting" program were developed by committees consisting of representatives from each of the participating societies. The first step was to develop a description of the theme and to identify abstract topic categories from the unified topic list that were appropriate for the theme. The second step was to build the symposium program for the theme from the sessions organized by the society program committees. As a result the APS list of approved symposia was reviewed by each of the theme committees to identify those that might be integrated into the theme. After the sessions were selected, they were scheduled in a manner designed to emphasize the "meeting within a meeting" format. However, the themes were not complete until the membership submitted their abstracts for Experimental Biology '93. The various theme committees, which included members of the APS Program Advisory Committee, met after the abstract deadline and organized those abstracts that had been earmarked for themes into slide and poster sessions designed to complement the symposium program.

As with any scientific meeting program developed by individuals, some of the themes were better organized and developed than others. However, every effort was made to make the Experimental Biology format unique, enabling attendees to participate in a "meeting within a meeting" while enjoying the benefits of the larger meeting.

Unfortunately, the organizers' efforts to develop a new and improved meeting format was frustrated by our attempt to modify the program book. In principle, it was a wonderful idea to provide scientists attending a theme with the complete program for the theme at the end of the book. However, in so doing, we failed to provide a complete program, by society, in the front of the program book. No matter how wonderful the Experimental Biology format might have been, the attendees were unable to recognize it because of the problems with the printed program.

The format, however, was not the cause of the reduced attendance at Experimental Biology '93, as suggested by Travis. Instead, it reflected the ebb and flow of the number of societies participating in the meeting. In New Orleans, there were four FASEB societies (APS, ASPET, ASIP, and AIN) participating in Experimental Biology '93. In 1994, six FASEB societies will participate, including AAI and American Association of Anatomists (AAA).

Experimental Biology '93, formerly the FASEB meeting, continues to address the needs of experimental biologists, whether or not they are members of the participating FASEB societies. The "meeting within a meeting" format is designed to make the meeting more attractive and addresses the desires of many scientists to attend smaller meetings. However, Experimental Biology '93 also provides the attendees with

# Education

# Mentees, Mentors Applications Available

The APS Women in Physiology Committee is already receiving applications for its new Mentoring Program for female students, postdoctoral fellows, and junior faculty. Female scientists interested in resuming their careers after a period of time outside of the academic arena are also encouraged to participate. The goal of the program is to increase the mentoring and networking interactions among women physiologists. Mentors will include both female and male APS members who will interact with mentees at scientific meetings and/or through letters, phone calls, and e-mail. Matching of mentors and mentees will be done according to their areas of scientific and professional expertise. For additional details, refer to the previous article in The Physiologist (36: 1, 2, 4, 1993) or contact the APS Education Officer, Marsha Lakes Matyas, or the chair of the Committee on Women in Physiology, Hannah Carey. To receive application forms to act as a mentor or mentee, complete the form below and return it to the APS Education Office at APS headquarters.

### APS Mentoring Program Information Request

.....

I would like to receive information on

\_\_\_\_ being a mentor

\_\_\_\_ being a mentee

\_\_\_\_\_ being both a mentor and mentee

Name\_\_\_\_\_

Address

Telephone \_\_\_\_\_

Return completed form to

Education Officer, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991.

# Nominations Invited for Guyton Physiology Teacher of the Year

The Teaching of Physiology Section of the American Physiological Society is sponsoring the second annual "Arthur C. Guyton Physiology Teacher of the Year Award." This award is supported by the W. B. Saunders Company. Nominees must be full-time faculty members of accredited colleges or universities and members of the APS. They must be involved in classroom teaching and not exclusively the teaching of graduate students in a research laboratory.

Each proposed person must be nominated by a member of the American Physiological Society. The nominator is responsible for profiling the following application materials and forwarding three copies to the Chairperson of the Award Selection Committee, postmarked by November 30, 1993.

- A letter of nomination from the nominator.
- Letters of support from three other colleagues familiar with the nominee's teaching career, one being the nominee's chairperson if possible.
- Letters of support from up to 10 current and/or former students.
- Scores on standard student evaluations of teaching effectiveness.
- Competitive teaching honors, such as the Golden Apple.
- Evidence of educationally related activities outside the classroom, such as developing laboratory exercises or teaching software, authoring textbooks or education research articles, education-related presentations at professional meetings, educational committees within the institution, educational consultation with other organizations, public appearances, etc.
- A copy of the nominee's curriculum vitae.
- Any additional documentation that the nominee wished to include, such as number of graduate students trained, number of undergraduate students pursuing careers in physiology, teaching innovations introduced, etc.

The award will be presented at the Teaching of Physiology Section banquet during the annual meeting of the APS at Experimental Biology '94 in Anaheim, CA, in April 1994. The Arthur C. Guyton Physiology Teacher of the Year will receive a framed, inscribed certificate, an honorarium of \$1,000, and expenses of up to \$800 to attend the meeting. The awardee is requested to write an essay giving her/his philosophy of education for publication in *The Physiologist*.

The Chairperson of the Award Selection Committee is Allen Rovidk, Department of Physiology, Rush Medical College, 1750 W. Harrison St., Chicago, IL 60612. Phone: (312) 942-6567; fax: (312) 942-8711.

# Meetings and Conferences

## **APS Conference**

## Signal Transduction and Gene Regulation

# November 17–20, 1993 San Francisco, California

Wednesday, November 17	Thursday, November 18	Friday, November 19	Saturday, November 20
Opening Reception	Signaling via G proteins I Craig Malbon	Growth factors, tyrosine ki- nases, and regulation I John Cambier	Mechanisms of gene regu- lation Gary Johnson
Evening Lecture Henry Bourne	Signaling via G proteins II Gary L. Johnson	Growth factors, tyrosine ki- nases, and regulation II C. Ronald Kahn	New strategies for molecular studies of reg- ulation Craig Malbon
	Afternoon Poster Sessions on G protein-mediated sig- nal transduction	Afternoon Poster Sessions on growth factors and tyrosine kinases	
	Evening Lecture Ronald M. Evans	Banquet Lecture James Wilson	

### **Participants**

Graeme I. Bell (University of Chicago), Morris J. Birnbaum (Harvard Medical School), Henry R. Bourne (University of California, San Francisco), Arthur M. Brown (Baylor College of Medicine), Donald D. Brown (Carnegie Institute of Washington), John C. Cambier (National Jewish Center for Immunology/Respiratory Medicine), Richard A. Cerrione (Cornell University), David E. Clapham (Mayo Clinic), Gregor Eichele (Baylor College of Medicine), Ronald M. Evans (Salk Institute), Daryl K. Granner (Vanderbilt University), Heidi E. Hamm (University of Illinois-Chicago), Gary L. Johnson (National Jewish Center for Immunology/Respiratory Medical Center), Harvey F. Lodish (Whitehead Institute for Biomedical Research), Craig C. Malbon (State University of New York, Stony Brook), Joan Massague (Sloan-Kettering Institute for Cancer Research), Randall R. Reed (Johns Hopkins University), Sue Goo Rhee (NHLBI, NIH), Günter Schultz (Freie Universität, Berlin), Melvin I. Simon (California Institute of Technology), Allen M. Spiegel (NIDDK, NIH), Hsien-yu Wang (National Defense Medical Center, Taiwan), David C. Watkins (Collaborative Laboratories), Morris White (Joslin Diabetes Center), Lewis T. Williams (University of California, San Francisco), James M. Wilson (University of Michigan).

## **Preliminary Program for APS Conference:**

# Physiology and Pharmacology of Motor Control October 2–5, 1993 San Diego, California

#### Saturday, October 2

Overview

Floyd Bloom, Scripps Clinic

- Symposium: Anatomy of Neurotransmitter Systems Chair: Tomas Hökfelt, Karolinska Institute
- Anatomy of fast neurotransmitters in relation to motor control. Jan Storm-Mathisen (University of Oslo)
- Spinal motoneuron afferents: ultrastructure, transmitters and origin. J. C. Holstege (Erasmus University)
- Peptides and coexisting transmitters in bulbospinal systems. Tomas Hökfelt (Karolinska Institute)
- Spinal cord ultrastructure. Steffan Cullheim (Karolinska Institute)

#### Sunday, October 3

Symposium: Neurotransmitters and Receptors Chair: Floyd Bloom (Scripps Clinic) Molecular biology of glutamate receptors. Stephen F.

Heinemann (Salk Institute)

Physiological characterization of glutamate receptor function. Mark L. Mayer (National Institutes of Health) Molecular biology of GABA production and action. Allan J. Tobin (University of California, Los Angeles) Physiological characterization of GABA receptor function. Roger A. Nicoll (University of California, San Francisco) Molecular and cellular biology of brain acetylcholine. R. Alan North (Oregon Health Sciences University) Electrophysiological actions of serotonin on facial motoneurons. George K. Aghajanian (Yale University) Peptides and endorphins. George R. Siggins (Scripps Clinic) Symposium: Neuropharmacology of Movement Control Chair: Sten Grillner (Karolinska Institute) Modulation of oscillatory neural networks. Eve E. Marder (Brandeis University) Transmitters in the network underlying locomotion in the lamprey. Sten Grillner (Karolinska Institute)

Reticulospinal synaptic mechanisms analyzed in evolutionary conserved glutamate, 5-HT, andpeptide neurons. Lennart Brodin (Karolinska Institute)

Saturday, October 2	Sunday, October 3	Monday, October 4	Tuesday, October 5
Overview Floyd E. Bloom	Neurotransmitters and receptors Floyd E. Bloom	Neurophysiology of control of movement in mammals James C. Houk	Disease of movement Joseph B. Martin
Anatomy of neurotransmit- ter systems Tomas Hökfelt	Neuropharmacology of movement control Sten Grillner	Neuropharmacology of motoneurons Jack L. Feldman	Summation Joseph B. Martin
	Afternoon Poster Sessions	Afternoon Poster Sessions	
		Evening Banquet Keynote speaker to be announced	

- Dynamic regulation of gene expression in neurocircuits of the basal ganglia. Ann M. Graybiel (Massachusetts Institute of Technology)
- Neurotransmitter control of cortical and thalamic action. David A. McCormick (Yale University)

#### Monday, October 4

Symposium: Neurophysiology of Control of Movement in Mammals

Chair: James C. Houk (Northwestern University)

- Functional organization of motoneurons and motor units. Robert E. Burke (National Institutes of Health)
- Spinal cord interneurons. Elzbieta Jankowska (University of Göteborg)
- Cerebellum and the inferior olive. Rodolfo R. Llinas (New York University Medical Center)
- Inhibitory control of saccadic eye movement by the basal ganglia. Okihide Hikosaka (National Institute of Physiological Sciences, Okazaki, Japan)
- Superior colliculus as a model of sensorimotor control. Robert Wurtz. (National Institutes of Health)
- Motor cortex. Apostolos P. Georgopolous (VA Medical Center, Minneapolis)
- Representation of motor programs in the cerebellum and premotor network. James C. Houk (Northwestern University)

- Symposium: Neuropharmacology of Motoneurons Chair: Jack L. Feldman (University of California, Los Angeles)
- Transmission of respiratory drive to spinal motoneurons. Guosong Liu (University of California, Los Angeles)
- Transmitter controlled intrinsic properties of spinal motoneurons. Hans R. Hultborn (University of Copenhagen)
- Monoamines, peptides and motoneurons. Susan R. White (Washington State University)
- Rhythm generation for respiration and locomotion. Jeffrey C. Smith (University of California, Los Angeles)

Descending control of locomotion. Larry M. Jordan (University of Winnipeg)

#### Tuesday, October 5

Symposium: Diseases of Movement Chair: Joseph B. Martin (University of California, San Francisco)

- Pharmacology of locomotion after spinal cord injury. Serge Rossignol (University of Montreal)
- Parkinson's disease. Yves Agid (INSERM, Hospital of Salpàtriäre, Paris)
- Motor dysfunction in Huntington's disease. Anne B. Young (Massachusetts General Hospital)
- Neurophysiology of Parkinson's disease. Mahlon R. DeLong (Emory University)

#### Summation

Joseph B. Martin (University of California, San Francisco)

## **1994 APS Conferences and Meetings**

### Intersociety Meeting

Regulation, Integration, Adaptation: A Species Approach Organizers: E. J. Braun, J. R. Hazel, and S. H. Wright October 29–November 2, San Diego, CA

### **APS** Conferences

Physiology of the Release and Activity of Cytokines Organizers: J. T. Stitt, J. G. Cannon, G. W. Duff, M. J. Kluger, A. J. Lewis, and I. G. Otterness June 25-28, New Haven, CT

Mechanotransduction and the Regulation of Growth and Differentiation Organizers: H. E. Morgan, P. A. Watson, D. E. Rannels, F. Sachs, M. Schwartz, and H. Vandenburgh October 5–8, Sarasota, FL

# Membership

# **Membership Statistics**

Total Membership		7,626
Distribution by employment (7,060 respondents)		
	No.	%
Medical schools	4.617	65
Physiology depts.	2.315	33
Other preclinical depts.	538	8
Clinical	1,701	24
Administration	63	1
Hospitals and clinics	284	4
Veterinary schools	154	2
Dental schools	46	1
Public health and graduate		
schools	118	2
Undergraduate schools	925	13
Commercial companies	200	3
Government	411	6
Institutes and foundations	197	3
Private practice	47	1
Other, emeritus or inactive	61	1
Distribution by Racial Backg Heritage (optional persona	round and al data)	1
	Total	
	responde	ents
American Indian or Alaskan	13	
Asian or Pacific Islander	489	1
Black	71	
White	5.387	
Hispanic	121	
	121	
US States With More Than 1 (50 States Plus District of Puerto Rico, and Virgin Is	00 Memb Columbia lands)	ers a,
, Onliformia	,	
California New York	/45	
	110	
ICAdS Donnauluania	438	
r chiisyivallia Marvland	383 240	
Massachusette	209	
	323	
Obio	318 266	
	400	

242

189

183

181

162

143

Georgia	133
Minnesota	128
Wisconsin	126
Conneticut	124
Tennessee	122
Louisiana	117
Indiana	116
Kentucky	104
Alabama	102
APS Membership in the Ame	ricas
US	6,735
Canada	358
Brazil	15
Mexico	9
Argentina	5
Chile	4
British West Indies	4
Venezuela	3
Bolivia	1
Panama	1
Peru	1
Canadian Provinces With 5 or Members	r More
Ontario	131
Quebec	87
British Columbia	49
Alberta	41
Manitoba	26
Nova Scotia	11
Saskatechewan	9
Other provinces represented	
New Brunswick, Newfour	idland,
Prince Edward Island	
APS Membership Outside the	Americas
(Countries with 5 or more	members)
Japan	83
Germany	57
United Kingdom	46
France	29
Switzerland	28
Italy	27
Australia	24
Netherlands	19
Israel Taiwan	17
Spain and Canary Islands	10
-r	* T

South Korea	13
Belgium	12
Sweden	12
Denmark	10
Norway	10
Hong Kong	8
PRC	8
Austria	7
Greece	6
Hungary	5
New Zealand	5
Other Countries Represente	d
Czechoslovakia, Finland	∼ I. Iceland.
India. Indonesia, Kuwai	t. Nigeria.
North Korea, Philippine	s, Poland,
Portugal, Saudi Arabia,	South Africa,
Thailand, Turkey, Forme	er Soviet Union,
United Arab Republic, Y	lugoslavia
Distribution by Earned Deg	ree (6,770
respondents) (Includes 9	57 individuals
with multiple doctorate of	degrees)
PhD	4,665
MD	2,692
DDS and other	170
DVM	169
Distribution by Age	
(optional personal data)	
	Total
	respondents
70+	855
60-69	1,329
50–59	1,765
40-49	2,100
30–39	1,079
20–29	184
Distribution by Sex	
(optional personal data)	
	Total
	respondents
Female	936
Male	5,867

Michigan

Florida

Missouri

Virginia

New Jersey

North Carolina

Principle Type of Work (7,124 respondents)

	%
Research	73
Teaching	12
Clinical	7
Administration	6
Other	2

Distribution by Section Affiliation (6,176 respondents)

	%
Cardiovascular	25
Respiration	14
Cell and general	11
Endocrinology and	
metabolism	11
Environmental and exercise	8
Renal	8
Central nervous system	7
Gastrointestinal	6
Comparative	4
Neural control and	
autonomic regulation	4
Teaching of physiology	2
Water and electrolyte homeostasis	2

Distribution by Primary Specialty (6,970 respondents)

	90
Cardiovascular	24
Respiration	12
Neurophysiology	11
Endocrine	7
Renal	6
Muscle and exercise	6
Gastrointestinal, food, and	
nutrition	5
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

Statistics represent membership as of April 1993

# **News From Senior Physiologists**

### Letter to Steven Horvath

Steven Horvath recently received "an impressive little book about altitude acclimatization" from Jack Loeppky of the Lovelace Medical Foundation in Albuquerque. The book is a translation by Friederich C. Luft of the PhD thesis written by his father, Ulrich C. Luft, which was originally published in 1941 in an obscure German journal. It summarizes the mountaineering and high altitude laboratory investigations performed in Europe in the 1930s in the context of the international research in this area until then. Horvath reports his amazement that the questions being posed and answers obtained in this area today "consist primarily of an elaboration of what has been known and predicted some 50 years ago." Jack Loeppky has additional copies of the book for those who may be interested.

### Letter to Helen Tepperman

"I retired in 1982 from the Armed Forces Radiobiology Research Institute," Siegmund J. Baum writes from Bethesda, MD, where he had been Chairman of the Experimental Hematology Department. He retired in 1988 from the Uniformed Services University of the Health Sciences, where he was Adjunct Professor of Physiology. "For the past ten years I participated also as a consultant in a number of physiological and radiobiological studies and was author or coauthor of several applied reports. I was also a member of the Board of Trustees of the International Society for **Experimental Hematology.** 

"I hope to hear from you from time to time and continue my association with the Society," Baum writes.

#### A MATTER OF OPINION (continued from p. 55)

the elements of the FASEB meeting that attracted them to the big meeting in the first place, namely, the exhibit program and the placement service.

Experimental Biology represents the efforts of the participating societies to address the needs of our membership and the scientific community. Through your comments and efforts, we can make Experimental Biology '94 even better. In fact, we have already started by increasing the number of "meetings within a meeting" to nine with the addition of "Respiratory Biology."

I look forward to seeing you in Anaheim in 1994.

Martin Frank

## **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.

# Publications

### Introducing . . .

## **Mary Anne Farrell Epstein**

Mary Anne Farrell Epstein assumed the Editorship of the Modeling in Physiology (MIP) department of the *Journal of American Physiology* and *American Journal of Physiology* (formerly the Modeling Methodology Forum) in March 1991, succeeding Joseph DiStefano, founding Editor of the Forum. She is Associate Professor of Pharmacology at the University of Connecticut Medical School in Farmington, and brings to this position 25 years experience in mathematical modeling of physiological and chemical processes.

Epstein requested a change in the name of the department to Modeling in Physiology to reflect the wider contribution mathematical modeling is making and will continue to make in advanced physiological research. She points out that mathematical modeling is not new to physiology and, in fact, is a basic tool for physiological research. Once the relationships among two or more physiological variables have been identified using statistical methods, the next logical step is to ask what biochemical, physical, and/or cellular processes are responsible for the statistically identified relationships. Mathematical modeling provides a framework for understanding the interaction and integration of physical and biochemical processes at the molecular, cellular, organ system, or whole human or animal level.

During her first year as Editor, Epstein substantially shortened the time for review of modeling papers, a factor that contributed to an increase of 24% in the manuscripts submitted to MIP during 1992. She plans to work with her Associate Editor, James R. Ligas, and with her Editorial Board to develop both short editorial reviews



and tutorials to make the potential of mathematical modeling more widely known and available to research physiologists.

Epstein received her bachelor's degree in chemical engineering from the Cooper Union School of Engineering in New York City and both her master's and doctorate degrees in chemical engineering from Columbia University, with specialization in applied mathematics and electrochemical kinesics, respectively. She then worked as a chemical engineer for Shell Oil Company and Cities Service Corporation. In 1972, Epstein joined the Department of Chemical Engineering, Applied Chemistry and Bioengineering at Columbia University.

Epstein's participation in biological research began with a collaborative investigation of cardiopulmonary maturation of infants considered at risk for Sudden Infant Death Syndrome (SIDS) at Columbia University's Children's Hospital. Although her teaching assignments at Columbia University centered on chemical engineering processes, Epstein brought unique examples of fluid flow, mass and heat transfer encountered in physiological research to the attention of her students. She remembers the surprise of her junioryear chemical engineering students when they were asked to read Schmidt-Nielson's *How Animals Work* (a collection of articles on heat and mass transport in the upper airways of desert mammals) during their heat transfer course.

Before joining the University of Connecticut Medical School faculty in 1983, Epstein served as National Science Foundation Program Director (rotational basis) for the Transport Phenomena and Thermodynamics Program for the Chemical Engineering Division and taught Computer Science in the Engineering Department at Trinity College in Hartford, Connecticut. At UConn, Epstein's research has focused on understanding fluid mechanics and mass transport during the unsteady flows characteristic of gas flows in the airways and blood flow in the circulatory system. Throughout her academic career, Epstein has been active in developing more effective teaching methods. While at Columbia, she received a CAUSE (Comprehensive Aid to Undergraduate Science Education) award from NSF to develop a multiyear computer-based laboratory course for teaching transport processes and kinesics. At UConn, she has introduced the use of computer simulations for teaching pharmacokinetics to second-year medical and dental students during the pharmacology curriculum.

She has served as a member of the Editorial Board of AJP: Advances in Physiology Education since its inception, is a charter member of the APS Teaching in Physiology Section, and has chaired sessions for this section. She has been active in the Biomedical Engineering Society, serving as Chair of the Awards and Affiliations Committees and as a elected member of the Board of Directors.

# **Clinton Releases Budget Proposals**

President Clinton's budget proposal recommends \$10.667 billion for the National Institutes of Health in FY 1994, an increase that is supposed to allow the agency to fund 5,594 new and competing grants. Although the proposal provides a 3.2% increase overall, AIDS funding is to be increased 21.1% over FY 1993, while non-AIDS funding is to be increased by only 1.1%. The funding at nine institutes (heart, kidney, neurology, eye, aging, arthritis, deafness, mental health, and alcohol) is to be cut by amounts ranging from from 0.5% to 1.6%. The overall NIH success rate for grants is projected to fall to 21.6% under Clinton's proposal.

The National Science Foundation is slated to receive a 16% increase, or \$446 million more than its FY 1993 appropriation. The request for the Biological Science Directorate is \$312 million in FY 1994, an increase of some \$41 million over the FY 1993 appropriated level. The agency's plans call for it to award more grants and to increase its average grant

size, which is currently \$50,000. However, this scenario might change depending on the final disposition of Clinton's economic stimulus package, which was to have provided the agency with an additional \$207 million in FY 1993 for research in targeted areas.

Veterans Administration medical research comes out a big loser under the Clinton budget proposal, which would cut VA medical and prosthetic research by \$26 million. This would be an 11% decrease compared with the \$232 million appropriated for health research in FY 1993. The program is already facing serious problems because it cannot support any new research this year. If the administration's budget proposal is approved, there will be no new research projects approved in FY 1994 either, but the VA will have to go further and terminate support to nearly a quarter of the research projects awarded last year.

# Future of US Animal Welfare Regulations Still Uncertain

The US Department of Agriculture filed a protective notice in late April preserving its right to appeal the February 25 federal court decision that struck down major portions of the federal Animal Welfare Regulations. US District Court Charles Richey issued the decision in a suit brought by the Animal Legal Defense Fund and the Society for Animal Protective Legislation against USDA, the Department of Health and Human Services, and the Office of Management and Budget.

The USDA filed the protective notice, although it has

not yet decided whether to appeal Richey's ruling, which requires it to rewrite regulations mandating dog exercise, assuring the psychological well-being of nonhuman primates and establishing minimum cage sizes for a variety of species. In another development on this case, Richey denied a motion filed by the National Association for Biomedical Research (NABR), requesting standing to intervene in this suit on behalf of the regulated community. NABR is deciding whether to appeal this ruling.

## New York Revises Animal Care Rules

The New York State Department of Health is moving to revise the state's animal care regulations. Draft regulations issued late last year that would have implemented engineering standards for animal care received a large volume of critical comments from the researchers as well as recommendations from animal rights activists that the state do more.

An interim revised draft was circulated in March that removed some objectionable elements from the proposal, such as requiring engineering standards, but it still contained provisions that differed significantly from federal animal care guidelines. APS President William Dantzler wrote to urge withdrawal of a proposal to require that one-third of every Institutional Animal Care and Use Committee consist of individuals not affiliated with the institution who could represent "community interests." Dantzler argued that it is unnecessary and unworkable to have one outside member for every two scientists on an IACUC. "Rather, the 2:1 ratio—as recommended to the department by animal rights groups—would seem to be a deliberate effort to hinder the protocol review process without improving animal welfare," Dantzler wrote.

A further revised draft is expected to be circulated for comment by early summer.

## Co-sponsors Needed for Biomedical Research Resolution

Another 127 Representatives need to become co-sponsors of a resolution to designate October 21, 1993 as "National Biomedical Research Day" before the legislation can be sent to the House Post Office and Civil Service Committee for action. House Joint Resolution 111 was introduced February 17, 1993 by Rep. Harold Volkmer (D-MO) and had only 91 co-sponsors as of May. Send a letter to your member of Congress (US House of Representatives, Washington, DC 20515), asking him or her to join Rep. Volkmer in co-sponsoring H.J. Res. 111. Be sure to ask your Representative for confirmation that he or she has cosponsored the resolution.

## NIH Strategic Plan Released

NIH's strategic plan was released May 13 after many months of discussions with the extramural community. The 118-page report—now titled Investment for Humanity—had to receive the stamp of approval from the new administration. Seeing the strategic plan through to completion was one of Bernadine Healy's goals for her tenure as NIH Director. Healy is scheduled to step down at the end of June.

## Germany Considers New Animal Law

Biomedical researchers in Germany are gravely concerned by a proposed amendment to that nation's 7year-old animal protection law. The amendment has already been approved by the council of the 16 German federal states and is awaiting action by Parliament.

The amendment would require researchers to submit more detailed forms concerning planned animal use, and the forms would have to be submitted earlier in the approval process. It would require scientists to provide the government with an accounting of all vertebrate animals killed in the course of their research, and it would also require animal activists to comprise one-half rather than one-third of the members of all animal protection committees.

## Court Overturns Honoraria Ban for Federal Employees

A federal appeals court ruled March 30 that the law barring federal employees from receiving honoraria for outside activities was "over-inclusive" and violated federal workers' First Amendment rights to free speech. The honoraria ban was part of the 1989 Ethics Reform Act and took effect on January 1, 1991. It forbid federal employees from accepting compensation for such outside activities as giving speeches and writing articles.

The National Treasury Employees Union sued to overturn the ban, and the court ruled that payments for outside activities of federal workers ranked below GS-16 should be governed by the ethics regulations and conflict of interest guidelines in place prior to the honoraria ban. The ruling affects about 2 million workers. The honoraria ban remains in effect for Members of Congress, congressional staff, and Executive Branch workers ranked above GS-16, including members of the Senior Executive Service.

However, the ban remains in effect because in mid-May the government appealed the ruling.

## Encyclopedia Britannica Corrects Article on Dogs

The 1993 edition of the *Ency*clopedia Britannica contains a revised article on dogs that eliminates statements denying the validity and relevance of research using dogs that appeared in the 1991 edition. The article on dogs in the 1991 edition provoked an outcry from the research community because of a number of false statements, including claims that equated research with cruelty.

Letters of thanks for the revision should be sent to Robert McHenry, General Editor, Encyclopedia Britannica, Britannica Centre, 310 South Michigan Ave, Chicago, IL 60604.

## PETA Reportedly Kills Rooster in Sanctuary

A PETA member recently sent iiFAR a postcard reporting that PETA had killed a rooster at its so-called animal sanctuary "for no better reason than that the town fowl pecked at people's shoes and fought with another, more popular rooster."

The disgruntled PETA member, who signed the postcard "Disgusted Insider," pointed out that the rooster's behavior was "not abnormal" and that PETA had not tried other ways to cope with the problem, such as by giving the rooster a private enclosure (which "according to P.E.T.A., would encroach on his 'quality of life' ") or by finding the rooster another home.

"P.E.T.A. seems to think it's immoral to kill animals except when they're doing it themselves," "Disgusted Insider" concluded.

### **Animal Probe Stymied**

A federal judge in Spokane, Washington freed one witness who had been held in jail for more than 5 months for refusing to give testimony to a grand jury investigating a raid at a Washington State University laboratory. However, US District Court Judge Fremming Nielsen also found another witness in civil contempt of court for refusing to answer grand jury questions in the same case. ALF claimed responsibility for the August 1991 raid, which released laboratory animals and caused an estimated \$150,000 in damage. No one has been charged in the raid.

The freed witness, Jonathan Paul, was not a suspect, but he was an acquaintance of a suspect whose whereabouts are unknown. Paul contended that he had a constitutional right not to answer questions posed by the grand jury about his personal life and friends that he claimed were unrelated to the WSU break-in. Judge Nielsen granted a motion to lift a civil contempt of court order against Paul on April 9, ruling that to continue to hold Paul was unlikely to coerce him into testifying and amounted only to punishment.

Three days earlier, however, Nielsen found Washington State University graduate student Rik Scarce in civil contempt of court for refusing to answer grand jury questions about the break-in. Scarce, a 35-year-old sociology researcher who has written a book on the radical environmental movement, contended that as a researcher he was legally protected from disclosing information on sources to whom he promised confidentiality. Nielsen freed him without bail pending an appeal to the 9th Circuit.

### **Animal Laboratory Liberation Week**

World Laboratory Animal Liberation Week was held April 24 to May 1 this year. Events included the following: Mobilization for Animals handed out organ donor cards April 24 to protest baboon liver transplants at the University of Pittsburgh. "This is a positive step we can take in helping animals and people," according to spokesman Joe Taskel. . . . About 100 activists organized by the American Anti-Vivisection Society held what police called a "peaceful protest" April 24 against the use of animals in head trauma research at the University of Pennsylvania in Philadelphia. . . . Los Angeles-based Last Chance for Animals started a hunger strike and candlelight vigil April 23 at Emory University to protest work at the Yerkes Regional Primate Center. There was also a counterprotest of community members who had benefited from animal research at Yerkes. Emory spokesman Cres Vellucci disputed the activists' allegations. "There has never

been a citation anywhere at Emory University that has anything to do with improper use of animals in research." ... The homes of five animal researchers or defenders of animal research who live in the Maryland suburbs of Washington, DC, were vandalized April 27. An unindentified woman called the Associated Press on behalf of a group calling itself Animal Avengers to claim responsibility for the attacks, which included spray-painted slogans, broken car windshields, and other damage. Americans for Medical Progress is offering a \$5,000 reward in the case.... Two protestors had to be forcibly evicted from grand rounds at the NIH Clinical Center on April 28 when they began shouting animal rights slogans. . . . The Animal Rights Coalition of Minneapolis held a rally May 1 and a three-day hunger strike to protest the use of monkeys in drug addiction research at the University of Minnesota.

## Interim NIH Fetal Tissue Transplant Guidance Issued

NIH announced interim policy guidance for fetal tissue transplantation research in the March 19, 1993 NIH Guide to Grants and Contracts. One of President Clinton's first actions upon assuming office was to issue an Executive Order ending the moratorium on research involving therapeutic transplantation of human fetal tissue that has been in effect since 1988. NIH's guidance is intended to ensure that research projects supported or conducted by NIH comply with the recommendations made in 1988 by the ad hoc advisory committee on fetal tissue transplantation research and the Advisory Committee to the NIH Director, as well as with federal regulations governing the projection of human subiects in research.

The interim policy will be published in a Federal Register notice in the near future, allowing the public an opportunity for comment before the guidelines are finalized. The policy covers issues such as separating the abortion from the research project; prohibiting payments or other inducements to donate fetal tissue for research; obtaining informed consent; prohibiting "directed donations"; compliance with state laws; ethical review of research; and determining when progress to clinical studies is justified.



# PHS Position Statements on Use of Animals in Research

In 1990 the Assistant Secretary for Health established the Public Health Service (PHS) Coordinating Committee on Animal Research to deal more effectively with the threat to biomedical and behavioral research and testing posed by the animal activist movement. The following two statements, released by the Committee in December 1992, represent the PHS position on these important issues.

#### Public Health and the Role of Animal Testing

This statement has been prepared to inform the general public about the need for animal testing to ensure that medications, vaccines, environmental chemicals, and a wide variety of consumer products, including cosmetics, are safe for the public when used appropriately. The Public Health Service (PHS) is concerned that animal activist organizations are trying to convince the public incorrectly that product testing on animals is outdated and no longer necessary.

Consumers may be further confused by announcements that some companies have stopped testing their products in laboratory animals. For example, two ways in which a company can make such a claim are by using only ingredients that historically are known to be safe or that have been previously tested in animals are found to be nontoxic. When new ingredients need to meet testing and safety requirements, it is often necessary to test them in one or more animal species.

To protect the public from unexpected or unintended effects of toxic substances, some PHS agencies conduct and support toxicological testing to determine the harmful effects of commonly used products. To judge whether a product may be unhealthy, or even deadly, for humans and animals, scientists called toxicologists must know how the substance is absorbed, distributed, used, stored, and released by the body. For some products, it may be necessary to identify long-term, cumulative health effects, such as the potential to cause cancer, promote birth defects, affect reproduction, or harm the nervous system. Without laboratory animals, scientists would lose a fundamental method for obtaining the data needed to make wise decisions about potential health risks.

The PHS agencies support many initiatives to develop and validate systems to reduce dependency on animal testing. Scientists have become skilled in culturing a wide variety of tissue and organ cells outside the living body (in vitro) and in writing computer programs that simulate human and animal systems.

Human and animal cell cultures are being used increasingly to screen toxic substances before progressing to whole animal testing. When in vitro studies show that a substance is toxic, testing it in animals may not be necessary. Computer models are also being used to predict the properties of substances and their probable actions in living systems. Although computers can store and analyze enormous amounts of data, some information must come from experimental animals. These non-animal research tools have reduced our dependence on animals, but they cannot completely replace experimental animals for the foreseeable future.

Toxicologists have the responsibility to treat laboratory animals with great care and compassion. Today, all projects involving animal testing supported by funds from the PHS must comply with the regulations of the Animal Welfare Act, as amended, and the Health Research Extension Act. These laws were enacted to protect research animals. An institution that uses laboratory animals for any purpose must operate a sound animal care program. The PHS fosters quality control in animal care and has a high regard for the welfare of laboratory animals.

The American people want assurance that the products they use in recovery from illnesses and daily living are safe; the US Congress has enacted laws that require the safety of products; and the scientific community endeavors to promote the public health through animal testing. Dr. James O. Mason, Assistant Secretary for Health, has put it this way: "Whole animals are essential in research and testing because they best reflect the dynamic interactions between the various cells, tissues, and organs comprising the human body."

The number of products used by society has increased greatly since animal testing began, but adverse health effects are relatively uncommon. This is, in itself, compelling evidence for the predictive value of animal testing of products for human use.

As a result of a recent lawsuit brought by two animal protectionist organizations, a federal court ordered the US Department of Agriculture (USDA) to reconsider its exclusion of rats, mice, and birds from coverage under the Animal Welfare Act. In the judge's opinion, "the USDA's decision not to regulate these species sent a message that researchers may subject these animals to cruel and inhumane conditions."

People who are familiar with the extensive system of US laws, regulations, guidelines, and principles that protect the welfare of laboratory animals would not necessarily agree with the judge's comment. The Public Health Service (PHS) wants to reassure the American people that other laws exist to safeguard the welfare of rats, mice, and birds, species that comprise about 90% of research animals.

According to the Health Research Extension Act, over

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1,000 institutions receiving funds from the PHS to conduct animal experiments are required to comply with the provisions of the Act and to follow the recommendations in the Guide for the Humane Care and Use of Laboratory Animals. The guide was prepared to assist researchers in maintaining high quality care for all commonly used laboratory animals. It includes the government principles for animal care and use adopted by all agencies and institutions that conduct federally supported animal research. This guide also applies under another Federal law, the Good Laboratory Practices Act. Research laboratories that conduct studies using rats and mice are regulated by the PHS's Food and Drug Administration and are subject to inspections. In addition, most institutions that do not receive PHS funding follow the guide. For example, laboratory animal breeders, pharmaceutical manufacturers, and commercial research laboratories that may not be subject to USDA and PHS regulations voluntarily participate in a national program of certification by the American Association for Accreditation of Laboratory Animal Care. This private organization monitors institutional animal care programs to be sure they maintain the standards set forth in the guide.

Animal use is an integral component of biomedical and behavioral research and testing. The vast majority of scientists recognize that good science and good animal care go hand-in-hand and would not tolerate or condone cruelty to, or

## **Detroit Physiological Society: Past and Present**

The Detroit Physiological Society held its annual poster session on March 25th at Wayne State University School of Medicine. Seventeen posters were presented by undergraduate and graduate students, clinical fellows, and faculty. Each student poster was scored by a panel of judges, based on the visual impact and scientific merit of the poster and oral communication and interpretation of the work by the presenter.

Timothy Hawkins, a physiology student working in the laboratory of Joseph Dunbar, won first place with the poster "Prolactin modulates the incidence of diabetes in male and female nod mice." John J. Mojares, a student in Jeffrey Ram's physiology laboratory, won second place with a poster entitled "Myoelectric activity in the zebra mussel." Two students, Gilberto M. Azzi (J. Mitchell, anatomy) and Adedapo O. Savage (R. Brown, physiology) took third place honors, with posters entitled, respectively, "Changes in ventricular size and cranial pressure in kaolin induced hydrocephalus in the hamster" and "Mechanism of negative inotropic effects of ethanol and acetaidehyde in diabetic rat ventricular muscle."

Serving this year as President of DPS is David G. Penney, physiology. Society Counselors are David M. Lawson, physiology; Mary F. Walsh, pathology; and Jerald A. Mitchell, anatomy, all of Wayne State University School of Medicine.

The DPS is the oldest local physiological society in the United States, presently enjoying its 56th year. The DPS owes its existence to Charles G. Johnston, who came to Wayne University School of Medicine in 1936 to be Professor of Surgery (1). He was elected the first president of the DPS. Thirty members were present at the organizational meeting on April 29, 1937. The composition of this group reflected Johnston's broad interests in the basic sciences and also some of his biases. Johnston be-lieved that surgeons should be applied physiologists and therefore needed to know more than just how to cut. The only general surgeon invited to be in the founding group was Roy D. McClure, Surgeon-in-Chief of Henry Ford Hospital. There were also three surgical specialists, a thoracic surgeon, an ophthalmolgist, a gynecologist, and four pathologists. Pharmacology was well represented with five founding members, four of whom were from the Parke-Davis Company. One of these was J. J. Pfiffner, famous for his isolation of compound F (cortisone) from the adrenal cortex and subsequent work of folic acid metabolism. There were two pediatricians, one of whom was Thomas B. Cooley, who described "Cooley's anemia in children." Others were from the Department of Physiology of Wayne University and other medical and academic backgrounds. There were 135 members at the time of the tenth anniversary meeting.

During the 1950s, 1960s, and early 1970s, the composition of the Society began to change, as earlier members retired and new members joined. Many of the newer members were associated with the new basic science departments at the Wayne State University School of Medicine. By the early 1960s, members of the Department of Physiology and Biochemistry were a significant factor in the organization. Walter Seegers, Chairman of the Department of Physiology, was an active member during the 1960s. He was the first individual to purify thrombin and prothrombin, helping to establish the field of blood coagulation biochemistry. The DPS continues to have a varied membership today, both from the Department of Physiology and other basic science department at Wayne State, as well as from clinical departments at Wayne State and other nearby institutions. Because the historic diversity of the DPS is seen as a strength, plans are now in the offing to further extend and broaden the membership.

#### Reference

1. Lam, C.R., and D.R. Yingst. History and future plans of the Detroit Physiological Society. Physiologist 28: 233-235, 1985.

# Association of Chairmen of Departments of Physiology 1992 Survey Results

Maureen Milici and Jason Banfelder Department of Physiology and Biophysics, Mount Sinai School of Medicine

Charlene Smith Department of Physiology, University of Oklahoma Health Sciences Center

The Association of Chairmen of Departments of Physiology annual survey was mailed to 157 physiology departments, and completed surveys were received from 78 departments. Participation level this year, a disappointing 49.7%, is the lowest response rate response rate recorded to date. A continuing pattern of decreased responses in recent years has been seen, although member participation had always been above 50% (1990, 67.3%; 1991, 60%; 1992, 56%). At the annual ACDP meeting in January 1993, the Executive Council of the Association agreed that the survey had become too cumbersome and that the lack of clarity in some items might contribute to the low response rate.

The Council organized a task force to address the survey and the low response rate. The consensus was that the survey form had become too complex and that much of the information gathered was not useful to the majority of members. The goal of the task force is to design a survey that would take under two hours to complete and include information considered pertinent by the ACDP membership. The results presented here represent a substantially condensed format that will set the model for the analysis of information in subsequent years.

Salary information is derived from the total compensation column, which includes any supplementary income (not including fringe benefits). Statistics are based on 71 responses, out of which 4 were from Canada and 1 was from Puerto Rico. Because of inconsistencies in defining and reporting part-time faculty salaries, most salary information is based on FTE=1. For the purpose of the "region" statistics (Table 4), the Canadian and Puerto Rico statistics were combined. A new chart to compare salaries by titles has been included, and remaining charts show salary range within titles (Assistant Professor and above) for a convenient comparison among Medical Private, Medical Public and Non-Medical institutions. It is noteworthy that the recent Report on Medical School Faculty Salaries 1992-93 published by the Association of American Medical Colleges<sup>1</sup> presents a salary distribution pattern for the discipline of physiology that is nearly identical to the results presented in Table 1.

The analysis of the departmental budget information has been modified. Based on the task force recommendations, we eliminated the previous breakdowns into "monies over which departments have managerial control" (column 1), "research dollars for all faculty" (column 2), and "faculty who occupy space" (column 3). Instead, averages were calculated based on column 1 and included "outside research grants and contracts" in column 2 where the respondent included all research dollars in column 2. Where separate figures were inserted under columns 1 and 2, only column 1 "research dollars" were used.

The detailed questions regarding space resources in the survey have been consolidated and the results have been presented under four categories: Research, Teaching, Administration, and Other. Data found under "Research" include individual labs, faculty office space, office space for predoctoral/postdoctoral trainees, laboratory support staff, and storage space specifically for research. "Teaching" space includes teaching laboratories and lecture halls. "Administration" data include administrative offices. "Other" data include common use space such as library, conference room, and lounge areas. The "Occupied/Used Square Feet of Space" column has been eliminated, and the results are based on column 1 only, "Controlled square feet of space". The data on "Shortfall" are eliminated.

For the most part, we eliminated any data that were inconsistent in an attempt to achieve accurate statistics within each category. Although results from only 78 responses (lower in certain categories) are not statistically valid, they provide the reader with an indication of general trends of faculty salary, overall departmental budgets, space available for research, as well as the average fringe benefits and indirect costs at various institutions.

After an indepth review of each category of data and their potential uses, task force members decided to eliminate information on Other Faculty, Faculty Subdisciplines, Unfilled Positions, Trainee Subdisciplines, Other Programs (faculty involvement), and Graduate Program applicants.

<sup>&</sup>lt;sup>1</sup>Smith, William C. Report on Medical School Faculty Salaries 1992-93. Association of American Medical Colleges, March 1993, p. 51, 66, 69.

Information on subsequent positions for Predoctoral/ Postdoctoral trainees has been eliminated, but data on their average annual stipends will continue to be collected. The Faculty section of the survey will contain information including tenure, rank, years in rank, degree, salary, gender, and ethnicity of each faculty member. Information will not be collected on faculty whose salary is less than 50% supported by the respondent's department.

The new survey form will be ready for use in collecting 1993 information.

TADLE 1. L'acuity Salaries for l'Iscal Teat 1992-19	iries for fiscal fear 1992-1993	v Salaries I	. Faculty	E 1.	ABL
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		% Change			
	1992/93	From 91-92			No. of
	Mean	Survey	Minimum	Maximum	Faculty
Chairmen					
All schools	\$114,719	4.91	\$66,470	\$187,913	71
Medical public	109,545	0.99	73,158	1 <b>66,000</b>	51
Medical private	136,840	19.11	<b>66,</b> 470	187,913	15
Nonmedical	101,132	2.93	88,400	120,000	5
Female	85,246	10.38	75,901	96,936	3
Professors					
All schools	82,414	1.01	36,100	195,000	423
Medical public	81,879	1.10	45,585	195,000	315
Medical private	87,233	2.02	49,158	128,000	81
Nonmedical	74,208	3.86	36,100	120,400	27
Female	78,994	1.72	44,792	106,189	30
Associate Professors					
All schools	60,019	2.88	19,995	168,600	324
Medical public	59,912	2.90	19,995	168,600	224
Medical private	60,915	3.00	38,000	96,601	77
Nonmedical	58,066	2.47	34,600	72,400	23
Female	61,799	3.20	<b>39,</b> 770	89,220	50
Assistant Professors					
All schools	45,962	1.52	20,000	95,932	243
Medical public	45,053	0.10	20,000	95,932	165
Medical private	47,895	3.41	33,150	73,867	65
Nonmedical	47,840	11.45	36,000	56,000	13
Female	46,317	6.26	20,000	62,229	53
Instructors					
All schools	29,935		18,135	51,797	35
Medical public	29,198	8.60	18,135	51,797	27
Medical private	32,732	—11.55	25,000	39,481	6
Nonmedical	31,500	5.66	28,000	35,000	2
Female	26,393	21.78	18,500	36,417	7

#### TABLE 2. Average Salary by Number of Years in Rank

(	Chairpersor	ns	Professors Associate Profe		essors	ors 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
05	\$105.732	21	0–5	\$75,689	129	0–5	\$59,037	158	0–5	\$45,449	205	1–5	\$27,846	28
6-10	119,292	16	6-10	82,076	110	6-10	60,082	74	<b>6</b> –10	48,448	28	6-10	42,204	4
11–15	125,510	17	11–15	84,234	63	11-15	59,929	50	11–15	44,267	5	11+	33,081	3
16-20	111,973	8	1620	87,622	65	16-20	62,387	29	16-20		0			
21–25	99,279	6	21–25	90,657	45	21-25	70,601	9	21–25	51,778	3			
26+	130,296	3	26+	89,750	11	26+	57,818	4	26+	59,315	2			

Type of	Instituti	on (n=78)				Student/Trainee Summary				
Supj	port	Тег	aching Interacti	ons		Do the primary faculty in your of PhD training either in a depart	lepartm nent-ba	ent participsed progra	pate in pl am or as	ysiology part of a
Private	24	MD/DO	68 Phari	nacy	20	multi-department, -college, -can	npus, or	committee	e-based p	rogram?
Public	54	DDS	21 Other	r Biomedical	34	Yes 76 No	5 2		•	U
		DVM	8 Life S	Science	46					
		Allied Health	40 Bioer	ngineering	17	Are there postdoctoral associates of your primary/core facility?	s, traine	es, or fello Yes 74	ows in lat N	oratories Io 4
Faculty	Summa	<b>m</b> (n - 78)				Total number of pre- and postd	loctoral	students/t	rainees/f	ellows in
raculty	Summa	ry (n=78)				program as described above:				
US citize	ens/perm	anent residency				Predoctoral male 675	Post	doctoral m	ale	423
	-	•	Pr	imary		Predoctoral female 476	Post	doctoral fe	male	239
			Male	Female						
American	n Indian/	Alaskan Native	0	0		Total number of foreign pre- and	l postdo	ctoral trair	nees in pr	ogram as
Asian or	Pacific I	slander	59	13		described above:	•		•	U
Black, no	ot of His	panic origin	11	5		Predoctoral male 258	Post	doctoral m	ale	246
Hispanic	-	. 2	22	3		Predoctoral female 164	Post	doctoral m	ale	114
White, no	ot of His	panic origin	892	168						
						Ethnicity of each pre- and poste	loctoral	trainee w	ho is eith	her a US
Foreign r	nationals	•				citizen or an alien holding perma	nent res	sidency sta	tus:	
•			Pri	mary			Prec	loctoral	Postd	octoral
			Male	Female			Male	Female	Male	Female
African			0	0		American Indian/Alaskan Native	2	2	0	0
Asian or	Pacific I	slander	13	1		Asian or Pacific Islander	42	33	31	2
Central o	r South A	American	4	0		Black, not of Hispanic origin	26	18	6	5
European	i, Canadi	an, Australian	34	8		Hispanic	16	9	4	5
Middle E	astern		3	1		White, not of Hispanic origin	326	263	164	113
Number o	of tenure	track in each dep	oartment (n=74)	)		Number of foreign pre- or post listed areas of origin:	doctora	l trainees	from eac	h of the
		•	× 2	·		-	Pred	loctoral	Postd	octoral
PhD	854						Male	Female	Male	Female
MD	54	tenure		779 (80%)		African	5	2	0	0
Both	53	eligible, b	ut not tenured	191 (20%)		Asian or Pacific Islander	162	111	124	47
Other	9	•				Central and South American	13	10	26	8
						European, Canadian, Australian	24	16	74	16
						Middle Eastern	14	6	10	3
						Other	2	3	3	5

### TABLE 3. Budgets by Institutions

	All Institutions	No.	Private Medical	No.	Public Medical	No.	Nonmedical	No.
Institutional	\$1,072,869	75	\$988.051	22	\$1,107,311	48	\$1,115,417	5
Outside Research Grants (direct costs only)	1,708,086	72	1.826.469	22	1.652.150	46	1.700.237	4
Training grants (direct costs only)	302,703	28	325,499	9	275,956	18	578.990	1
Endowments	129,659	24	104,844	6	128,404	17	299.866	1
Indirect recovery cost (amount return to dept)	124,314	39	156,148	8	118,749	28	91,374	3
Other budget support	143,673	41	254,554	15	71.677	24	176.033	2
Other	97,091	16	121,298	7	55,909	7	156,500	2
Average Standard Deviation	2,892,521 1,680,071	75	3,077,434 1,671,561	22	2,813,322 1,694,768	48	2,839,216 1,879,894	5

45

Female

0

2

0

1

28

Predoctoral female

Male

0

3

2

3

42

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

	Predoctoral	Postdoctoral
Institutional	173	21
Research grants	224	309
Private foundations	12	26
Home (foreign) governments	12	29
Other	13	7

Average annual starting stipend (in US dollars) for trainees:

Predoctoral (n=72)	Postdoctoral (n=67)
\$11,706.51	\$20,805.28

**Space Controlled by Department** (n=74)

Research	19,909	African	0	0
Administration	1,088	Asian or Pacific Islander	23	13
Teaching	1,720	Central and South American	2	0
Other	1,185	European, Canadian, Australian	5	1
Total space	23,903	Middle Eastern	2	1

**Predoctoral Trainee Completions** 

year ended June 30, 1992 (n=53). Predoctoral male

American Indian/Alaskan Native

Asian or Pacific Islander

Hispanic

Foreign nationals:

Black, not of Hispanic Origin

White, not of Hispanic origin

Number of trainees who have completed doctoral work during the

81

US citizens or aliens holding permanent resident status:

#### TABLE 4. Salaries by Region

	Mean	Minimum	Maximum	No.		
Chairpersons					444 - X	
Northeast	\$124,847	\$89,723	\$187,913	16	Northeast:	ME NH VT NY
Midwest	119,593	66,470	182,000	21		MA RI CT NJ
South	114,136	74,941	166,000	18		PA MD DE DC
West	107,735	89,369	138,504	10		
Canada/Puerto Rico	84,043	73,158	107,125	6		
Professors						
Northeast	88,489	63,083	120,963	90	Midwest:	MI OH IN IL WI
Midwest	80,809	46,158	128,000	128		IA MO KS NE
South	76,359	40,585	134,000	101		ND SD MN
West	86,843	36,100	195,000	73		
Canada/Puerto Rico	80,712	55,000	129,350	31		
Associate Professors						
Northeast	65,759	42,900	96,601	76	South:	VA WV KY TN
Midwest	58,939	33,790	86,210	101		NC SC GA FL
South	55,962	19,995	111,800	94		AL MS AR
West	63,254	28,560	168,600	27		LA OK TX
Canada/Puerto Rico	58,750	39,360	93,905	26		
Assistant Professors						
Northeast	47,199	20,000	61,120	52	West:	AK HI MT WY
Midwest	46,655	27,716	73,867	72		CO NM AZ
South	44,819	28,500	95,932	63		ID NV WA
West	44,744	20,000	61,917	40		OR CA UT
Canada/Puerto Rico	46,374	34,356	56,971	16		
Instructors						
Northeast	35,090	28,000	<b>39,</b> 481	4		
Midwest	31,248	22,788	33,545	6		
South	27,888	18,500	45,600	22		
West				0		
Canada/Puerto Rico	35,450	18,135	51,797	3		

#### **Financial Information**

Percent of total faculty salaries supported by research grants (not including fringe benefits costs):	28.5%	(56)
Current fringe benefit rate most frquently used for primary, full-time faculty:	24%	(73)
Percentage of departmental salary savings returned directly to department:	34.8%	(78)
Federally negotiated indirect cost rate for fiscal year 91-92 on campus:	50%	(66)
off campus:	27%	(45)



### Salary Comparison By Title

#### **Chairmen by Institution**



#### **Professors by Institution**



Associate Professors by Institution







# FEDERAL SUPPORT OF RESEARCH (continued from p. 54)

Novello puts the same point a different way: "Disease doesn't respond to the tears of a mother or a father, or the grief of a wife with a husband who has had a spinal injury—it responds to science."

And another Surgeon General, with considerable continuing impact on the public and public decision-makers, is also a spokesperson for research. As Dr. C. Everett Koop states in his advertisements for Research!America, "Warning: Insufficient medical research can be hazardous to your health."

A number of public opinion polls reinforce these common sense indicators of the high regard and continued confidence the public feels in research.

For example, the Lou Harris poll in April 1992 found a majority (91%) of respondents favor spending more on medical research, with energy research second (86%) and environmental research third (85%). Far down the list are defense and space research. The same poll also showed that when asked to indicate "only one/the most important" type of research, 49% of the respondents expressed the belief that medical research is the most valuable of the eight types of research listed, with environmental research second (29%) and energy research third (10%).

In the Research!America Maryland Demonstration Project conducted in January 1992, 69% of the respondents wanted their elected representatives to support more federal spending on medical research. The survey also showed that 47% would favor an increase in government spending for medical research even if taxes must be raised, while 48% would not support an increase. The 47% exceeds by more than double the percentage shown in other polls of the public's willingness to have taxes increased to support high priority public concerns like better access to health care and control of the deficit. The January survey indicated that 45% of respondents felt R&D costs resulted in decreased medical costs, while 36% felt R&D costs drive up medical costs. These results suggest that there is a significant opportunity for public education on this topic.

In a poll conducted by the Alliance for Aging Research, it was found that 82% of respondents feel that government health care reform efforts should include more emphasis on medical research to cure and prevent disease. It was also noted that 76% of respondents see spending more money now on medical research as a way to reduce health care costs in the future.

I think the attitudes we heard in Maryland and in the Harris poll and other nationwide samples are sufficient indicators of the very strong public support behind the research enterprise. Your challenge and mine is not—I repeat not—to generate that support but rather to activate it. That's where you come in! The way to make sure that you succeed is to have the public demand it! If you and other members of the public will make that demand, your elected representatives will respond to it. It's a matter of getting involved.

Let me then give you a few thoughts on why and how to get involved and what to do and what to avoid in public campaigning for research. One especially good reason why to get involved in talking to the public that may seem counter-intuitive is that the public wants to be much more involved with decisions about science. A North Carolina State University Consumer Attitude Survey on Science and Biotechnology conducted in July 1992 found that 84% of the respondents believed that most problems could be solved by applying more and better technology to them. They (84%) also indicated that science and technology should be used more to raise our standard of living. However, 81% of the respondents felt that citizens deserve a greater role in decisions about science and technology. The survey also showed that 79% felt that citizens have too little say in decisions about whether biotechnology should be used. Similarly, 91% stated that "Government should pay more attention to what people like me think about biotechnology."

These data fit very nicely with recommendations of the recent Carnegie Commission report recommending that all sectors of society become involved in an ongoing dialogue on future directions for science and technology in the context of societal needs and aspirations.

Now let me shift gears and offer a few words on tactics, drawn from the Bush Administration's Science Advisor Allan Bromley, who says it so well: "Nothing is more counter-productive than for various parts of the scientific and engineering community to cannibalize one another in public or in the budget process. The assumption behind this behavior tends to be that if funding does not go to your project, then it will go to mine. But Washington simply does not work that way. If it chooses to cut support for R&D, Congress is much more likely to spend the funds on immediate consumption than on other investments in the future. . . . Scientists and engineers can no longer ignore the political process and trust that someone in Washington will eventually realize how important their work is to the future of the nation. ... Scientists and engineers need to recognize the terms of the debate, the criteria applied in decisions, and the perceptions of policymakers and the general public."

Recognizing the terms of debate and using them to your advantage and being sensitive to the public's perceptions, and to those of policymakers who respond to the public, is the underlying philosophy of Research!America. These are indeed the realities and the tactics that we, and you as members of the research community, must become proficient at using.

Here's a different kind of tactical suggestion: adopt a new mode of working with the press. Rather than working around, in spite of, or against the press, invite the leaders of science journalism to work with you. I hear a lot of lip service given to this idea and from time to time hear about conferences that attempt to link the two communities, science and journalism. But despite good intentions I think there is an underlying attitude problem. The scientific community doesn't really see the relationship between science and journalism as 1) an exchange relationship in which both parties will ultimately lose if both don't win and 2) a relationship in which both partners are bound to the public for support. We fail to take advantage of the fact that we have this fundamental reality in common.

It is not useful to think of the media as vehicles or agents of science—we should instead be true allies, and we should consider together how we would answer the following question (a question posed by Pierre Fayard in a new journal on the public understanding of science): "How does a venture in the public communication of science and technology see its public? As empty vessels to be filled, as warped minds in need of straightening out, as citizens with whom to enter into dialogue, or as taxpayers to be convinced of the necessity of funding research?" Finding an answer to this question may be worth a conference in itself. Personally, while all the answers have merit, I favor the dialogue approach: it fits with what the public says it wants; it fits the Clinton-populist mentality; it gets us thinking about getting out of the ivory tower and on the bus.

Now a word on the message the research community is delivering. We must remember that the public needs to know that it is getting its money's worth, that there is value delivered. The science community would be well-served by working more on getting the cost issue into a terms-of-debate context, firmly connected in a positive way to other current cost concerns that people can relate to, like the \$800+ billion cost of health care. Research is the solution rather than a part of the problem. But how many of us can cite examples? The new FASEB Consensus Conference Report is a good start, but I'd like to see "dollars saved" added. In fact, I'd like to see the report recast for a number of different audiences.

And now, here are a few words on the words we use to deliver our message. I urge all scientists to pledge to become publicly comprehensible. Why do scientists feel resentment against the idea that speaking to the public requires a different language than speaking to colleagues? Just as it doesn't help and in fact is insulting to non-English speakers for the monolingual to talk louder and slower, it is entirely nonproductive to pronounce alpha adrenergic receptors for norepinephrine once again, louder and slower, to your next-door neighbor or your Congressman. As in all attempts to improve cross-cultural cooperation and understanding, it helps if people learn one another's language. I suggest that instead of waiting for the nonscientific public to learn our language, we should learn theirs. This should not be so hard, since we already speak it! If you can explain what you do to your mother, you can explain it to a reporter and to a Congressman. If you can't explain it to your mother-if she isn't in fact your number one P.R. Agent-that's where your political advocacy work needs to start!

There are specific word choices that are proving increasingly counter-productive with the public, despite being endowed with virtually sacrosanct status in the science community. "Unfettered" and "unbridled" research are two prime examples: what does that kind of terminology conjure up if you haven't taken the Vannevar Bush Oath of Allegiance? It conjures up yachts and golden fleece awards and "fraud, waste and abuse."

And then there's the term PI. "Problem solving" is a nicely transferable concept between what science PIs and television private investigators do, but consider that both are agents, hired by someone to get a job done. Television PIs don't go off doing the job on their own. In fact, it is predictable that there will be trouble if they go off on their own; they very often self-destruct. The point is that "investigatorinitiated" can convey some confusing messages.

And, here's another counter-productive turn-off phrase: complaints about not being able to do the science in the "fringe" areas. The speaker may mean just above the pay line, but the listener may be silently applauding our good fortune as taxpayers in avoiding the "fringe" districts and the "fringe" elements that inhabit them. Let's replace all these with words that convey energetic pursuit of societal goals.

Let me point out another problem we have with words. Let's not be confused that "accountability" is the same as "quality." Quality in science is determined by peer review, and rightly so. Accountability is something more. Accountability has to do with explaining and justifying the public's investment in science to the public and the public's elected representatives, not justifying it to fellow scientists.

I had two very different testimonials to the accountability point just recently. First, the head of a major foundation commented that the only accountability scientists seem to feel is to each other, disdaining accountability to the public. Needless to say, this is not the perception of one about to write you a check. Second, I had a conversation recently on an airplane with a young federal auditor of prisons, who complained that scientists seem to feel they're different/they don't need to follow the rules that come with tax dollars/they don't seem to value or understand an auditor's role on behalf of the citizenry.

So, to summarize some of the points I've tried to emphasize, I leave you with the reminder that the public is overwhelmingly on our side; that our mission is to activate not generate public support; and that you, the members of the scientific community, can and should be the activating agents.

The last word is advocacy. My plca to you is to get involved and in doing so to be proud of being an advocate—at least as proud of what you're doing in science—because we won't be able to exploit the next generation of scientific opportunities if we don't learn to exploit the advocacy opportunities that confront us today.

Research!America is proud to be working to assure your success and is indeed proud to be your partner.

Thank you.

Thomas W. Balon, formerly at the University of Iowa, is now with the Department of Diabetes, Endocrinology and Metabolism at the City of Hope National Medical Center, Duarte, CA.

William Selig is now Associate Director of Inflammation and Pharmacology at Cortech, Inc. He was formerly with Hoffman-La Roche.

APS member Michael Andrew Hajdu has joined the Department of Physiology at New York Medical College. He moved from the University of Iowa.

Formerly at the John A. Burns Medical School, Honolulu, John R. Claybaugh is now at the Tripler Army Medical Center, Hawaii. Clayburgh joined APS in 1974.

Maria A. Burnatowska-Hledin has moved to the Department of Biology, Hope College, Peale Science Center, Holland, MI. She was formerly at Michgan State University.

James T. Molt has moved from Merck Sharp & Dohme Research Laboratories to Rhone-Poulenc Rorer, Collegeville, PA.

Formerly at the University of Waterloo, Ontario, APS member Yoshiharu Yamamoto has joined the Laboratory for Exercise Physiology & Biomechanics, University of Tokyo, Japan.

**Patricia Lynne-Davies** is now with the Pulmonary Medicine Division of Harper Hospital, Detroit, MI.

An APS member since 1990,

Jorge Valenzuela has moved from the University of Puerto Rico to Lavedo, TX.

Lori L. Wickham is now at the Joseph M. Long Marine Laboratory, Institute of Marine Sciences, University of California, Santa Cruz. She moved from AMES-Bioengineering, San Diego.

Formerly at the Texas College of Osteopathic Medicine, Jon W. Williamson has moved to the University of Texas Southwestern Medical Center.

John E. Zehr is now President of Bethel College, North Newton, KS. He was formerly at the University of Illinois.

**Denham S. Ward** has moved from UCLA to the Department of Anesthesiology, University of Rochester Medical Center. Ward became an APS member in 1990.

Formerly at Brown University, Jeremy S. Wasser is joining the Texas A & M University College of Veterinary Medicine.

APS member George B. Weiss has moved from Ciba-Geigy to M. Hurley & Associates, Inc., Murray Hill, NJ.

John D. Strauss has moved from the University of Heidelberg to the Department of Physiology at the University of Virginia Health Sciences Center, Charlottesville.

Formerly at the Morehouse School of Medicine, APS member Rajago-

Future Meetings						
1993						
APS Conference	October 2–5					
Physiology and Pharmacology of Motor Control	San Diego, CA					
APS Conference	November 17–20					
Signal Transduction and Gene Regulation	San Francisco, CA					
1994 Experimental Biology '94	April 24–29, Anaheim, CA					
1995 Experimental Biology '95	April 9–14, Atlanta, GA					

#### **People and Places**

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 two months (by the 15th of the month) before the desired publication date. Send all information to *The Physiologist*, APS, 9650 Rockville Pike, Bethesda, MD 20814.

pala Sridaran is now with the Department of Biology at the University of California, Santa Cruz.

Joseph F. Souhrada is now at Boehringer Ingelheim Pharmaceuticals, Ridgefield, CT. He was formerly with Pfizer Central Research.

**Donald J. Marsh** has moved from USC to a position as Dean of Medicine and Biological Sciences, Brown University, Providence, RI. Marsh has been a member of APS since 1967.

APS member **David B. Averill** has joined the Hypertension Center at Bowman Gray School of Medicine, Winston-Salem, NC. He was at the Cleveland Clinic.

Nicholas A. Saunders has accepted a position as Dean of the School of Medicine at Flinders University of South Australia, Adelaide. He moved from the John Hunter Hospital, New South Walcs, Australia.

Formerly at Vanderbilt University, James O. Hill is now at the University of Colorado Health Sciences Center, Denver.

Steven A. Hyman is now with the Department of Anesthesiology, Vanderbilt University School of Medicine, Nashville, TN. He was formerly with the Anesthesia Associates of Madison, TN.

Sandra Legan has accepted a position as Professor of Reproductive Physiology at the University of Kentucky, Lexington. Formerly at the University of Michigan, Legan has been a member of APS since 1973.

### The Biochemistry of Exercise and Metabolic Adaptation

#### Wayne C. Miller

Debuque, IA: Brown and Benchmark, 1992, 134pp., illus., index, \$17.00.

This small text provides foundation reading for the serious student in exercise physiology. It is designed to be used for a onesemester course in exercise biochemistry and metabolism, muscle physiology, or as supplemental reading in a basic exercise physiology course. The author has attempted to clearly define terminology so that the advanced undergraduate can comprehend the concepts. The text could provide a good infrastructure for a graduate course on these topics as well.

The text begins with an elementary discussion of the structure and function of muscle. This is followed by a simplified treatment of the basic metabolic pathways for energy production, including brief discussions of fat and protein catabolism. Chapter 3 considers the pathways of glycogen, fatty acid, and triglyceride synthesis. Chapter 4 discusses the regulation of the ATP generating metabolic pathways during exercise. The remainder of the book (5 chapters) considers the ultrastructural, metabolic, and hormonal adaptations to exercise training, with emphasis on endurance training. There is a tendency toward emphasis of the classical adaptations described in the 1970s, but more recent work is also referenced. The documentation was not intended to be comprehensive. For the target audience, I think this little text would be helpful in gaining a basic understanding of the metabolic adaptations to exercise.

> Will Winder Brigham Young University

### The Biological Bases of Drug Tolerance and Dependence

#### Judith Pratt (Editor)

Neuroscience Perspectives. Peter Jenner (Series Editor). London: Adademic, 1991, 301 pp. illus., index, \$80.00

This monograph is intended for researchers and students of various backgrounds to provide an overview of basic research studies and clinical features associated with drugs of abuse. The drugs reviewed include both selective (benzodiazepines) and nonselective CNS depressants (barbiturates and alcohol); amphetamine and nonamphetamine (cocaine) psychomotor stimulants; opiates; cannabinoids; and nicotine. The book emphasizes the neuronal mechanisms underlying the development of tolerance (a decrease in effectiveness with repeated drug use), physical dependence (the emergence of a withdrawal syndrome upon discontinuation), and psychological dependence ("psychic craving") with the use of these drugs. In her introductory chapter, the editor has attempted to synthesize the common molecular and cellular methanisms underlying drug tolerance and dependence. The adaptive neuronal processes related to pharmacodynamic tolerance are discussed with a focus on the effects of chronic drug use on the regulation of drug receptor-interactions. The neuronal pathways and adaptive processes involved with the reward properties of drugs are addressed in relation to drug "craving." Evidence is also presented relating the ability of psychotropic drugs to induce withdrawal phenomena with a dysfunction in specific neural systems. Based on the findings presented, strategies for development of treatments are proposed. A separate introductory chapter deals with the clinical aspects of abused drugs. Additional chapters discuss the specific mechanisms proposed to underlie tolerance and dependence to each of the various classes of drugs of abuse. A final chapter discusses the possible role that genetics may play in drug dependence. All chapters also attempt to provide treatment applications. As a typical danger with monographs, there is at times an overemphasis on a particular lab group's work. However, the majority of authors, who are experts in their respective fields, have done a very good job placing their work in the context of the large body of research on these topics. Current theories are reviewed and supported with numerous up-to-date references. The introductory and review chapters follow an outline format that facilitates the goal of this series to help students. Scientists and clinicians integrate a sizable basic science literature. Overall, the book is well-organized and well-written and provides an excellent overview of the current state of understanding of the molecular and cellular mechanism that underlie drug tolerance and dependence.

> Elizabeth I. Tietz Medical College of Ohio

### The Hijacking of the Humane Movement

R. Strand and P. Strand

Wilsonville, OR: Doral, 1993, 174 pp., index, \$16.95

The Stands are dog fanciers, who have written a lot (and well) for dog magazines. Three case studies—Taub, Berosini, and the tuna industry attack—will broaden your perspective on the whole problem. Their philosophical reflections are particularly good.

Adrian R. Morrison Director, Program for Animal Research Issues National Institute of Mental Health

#### **Positions Available**

There is a \$50 charge for each position listed. Positions will be listed in the next available issue of *The Physiologist* and immediately upon receipt on the **APS Gopher Information Server**. Listings will remain on the APS Information Server for 3 months.

A check or money order payable to the American Physiological Society must accompany the position listing. Purchase orders will not be accepted unless accompanied by payment. Ads not prepaid will not be printed. Copy must be typed double spaced and is 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 when given on original copy. Copy deadline: copy must reach the APS office before the 15th of the month, two months preceding the month of issue (e.g., before February 15th for the April issue). Mail copy to APS, *The Physiologist*, 9650 Rockville Pike, Bethesda, MD 20814-3991.

### Environmental and Metabolic Animal Physiology: Comparative Animal Physiology, Fourth Edition

C. Ladd Prosser (Editor) New York: Wiley-Liss, 1991, 578 pp., \$45.90

The 1951 first edition of Prosser's text in comparative physiology set very high standards in terms of providing comprehensive coverage. The number of references was outstanding and represented an initial source for nearly all topics in comparative physiology. With subsequent editions following the same pattern there is little doubt but what the 1,722 references in this edition and the 2,573 references in the third edition will give most students of comparative physiology inroads to their favorite topics.

The organizations of this book is by physiological systems, which will make it cumbersome for zoology students interested in a given species or group of organisms to find the information they may be seeking. In contrast, persons interested in a particular physiological system should readily find evidence of the diversity of processes nature has evolved to make a given system functional. Recognizing the diversity of a given system is one of the real advantages from studying comparative physiology. The student of a given mammalian system can gain valuable insight into the system by learning the diversity of the system evolution has produced in a variety of organisms.

Although there are differences in the style of writing by the 13 authors involved in the 11 chapters, there is considerable continuity in terms of the approaches to comparative physiology. The reader can't escape the fascination of the topics. My largest objection to the text has to be the use of the term biological adaptation. Biological adaptation is used at times when Darwinian selection is the preferred term and at other times when acclimatization is the preferred term. The reader needs to be aware of this problem and decide just what is intended by the term biological adaptation.

The initial subject matter is a comprehensive presentation of water and electrolyte balance. The temperature regulation chapter concerns primarily thermal neutral zones, biochemical, and behavioral responses associated with temperature extreme and acclimatization. The involvement of all physiological systems in responses to thermal stress is emphasized. Physiological systems operating under high hydrostatic pressure as presented by G. N. Somero represents numerous examples of "gee whiz" physiology. In other words, it is impressive to note the extent to which physiological and biochemical systems can be modified to cope with extreme environments.

Chapters concerned with feeding, digestion, and nutrition once again convey the diversity of physiological systems ranging from symbiotic relationships in corals to neural control of appetite in mammals. The similarities and differences in biochemical requirements is presented such that limited background in biochemistry is needed by the reader. The excretory nitrogen metabolism is a classic story in comparative physiology and raises interesting challenges regarding phylogeny and ontogeny. Hochackka's chapter on design of energy metabolism makes for fascinating reading and once again can be comprehended with minimal biochemistry background. The final chapters on respiration, metabolism, and cardiovascular physiology are very readable and convey comprehensive understanding of these physiological systems.

The authors present molecular biology in a manner that is not overwhelming and relate this material to whole-organism biology. Every physiologist will gain increased fascination for physiology by reading this book.

> M. L. Riedesel University of New Mexico

### **BOOKS RECEIVED**

Targeted: The Anatomy of An Animal Rights Attack. Lorenz Otto Lutherer and Margaret Sheffield Simon. Norman, OK: Univ of Oklahoma Press, 1993, 170 pp., illus., index, \$22.95. ISBN: 0-8061-2492-X.

The Biology of Neuropeptide Y and Related Peptides. William F. Colmers and Claes Wahlestedt (Editors). Totowa, NJ: Humana, 1993, 590 pp., illus., index, \$99.50. ISBN: 0-89603-241-8.

Chronic Fatigue Syndrome. David M. Dawson and Tohomas D. Sabin (Editors). Boston, MA: Little Brown, 218 pp., illus., index, \$65.00. ISBN: 0-316-17748-2.

Oxygen Transport in Biological Systems: Modelling of Pathways from Environment to Cell. S. Egginton and H. F. Ross (Editors). Society for Experimental Biology Seminar Series 51. New York: Cambridge University Press, 298 pp., illus., index, \$110.00. ISBN: 0-521-41488-1.

Structure and Function of Primary Messengers in Invertebrates: Insect Diuretic and Antidiuretic Peptides. K. W. Beyenbach (Editor). Molecular Comparative Physiology, Vol. 12. R. K. H. Kinne, E. Kinne-Saffran, and K. W. Beyenbach (Series Editors). Ithaca, NY: Karger, 180 pp., illus., index, \$196.00. ISBN: 3-8055-5704-3.

Exploring Brain Functions: Models in Neuroscience. T. A. Poggio and D. A. Glaser (Editors). Report of the Dahlem Workshop on Exploring Brain Functions: Models in Neuroscience. New York: Wiley, 340 pp., ilus., index, \$150.00. ISBN: 0-471-93602-2.

Stress, the Aging Brain, and the Mechanisms of Neuron Death. Robert M. Sapolsky. Cambridge, MA: MIT Press, 429 pp., illus., index, \$55.00. ISBN: 0-262-19320-5.

Hemispheric Asymmetry: What's Right and What's Left. Joseph B. Hellige. Perspectives in Cognitive Neuroscience. Stephen M. Kosslyn (General Editor). Cambridge, MA: Harvard University Press, 396 pp., illus., index, \$35.00. ISBN: 0-674-38730-9.

Calcium in Muscle Contraction. (Second Edition). Johann Caspar Raegg. New York: Springer-Verlag New York, Inc., 354 pp., illus., index, \$89.00. ISBN: 3-540-55544-7.

## NABR Publishes Issue Updates

The National Association for Biomedical Research (NABR) has published a series of Issue Updates on the following topics: "Animal Rights Extremists: Impact on Public Health"; "The Humane Care and Treatment of Laboratory Animals"; "Regulation of Biomedical Research Using Animals"; and "The Use of Animals in Product Safety Testing." Copies can be obtained by writing to NABR at 818 Connecticut Avenue NW, Suite 303, Washington, DC 20006.

## OPRR Holds Workshops

The Animal Welfare Division of OPRR will be holding its Southwestern region workshop on "The Present and Future Use of Farm Animals in Biomedical Research and Education" on September 27-28, 1993 at the Oklahoma City Marriott. OPRR workshops are open to investigators, institutional administrators, members of IACUCs, laboratory animal vets, and other institutional staff with responsibility for high-qualtiy management of sound institutional care and use programs. The northwestern region workshop will be held June 21-22 at the Warwick Hotel in Philadelphia on the topic "Ethical Issuess of Animal Use in Academe and Industry." For further information about these workshops, contact Roberta Sonneborn at OPRR, (301) 496-7163.

## AAAS Publishes Scientists Guide

The American Association for the Advancement of Science has recently published Working With Congress: A Practical Guide for Scientists and Engineers. The 148 page document is available from AAAS Books, Department A 64, PO Box 753, Waldorf, MD 20604. The cost is \$12.95 plus \$4.00 shipping. For telephone orders or more information, call (301) 645-5643.

### **SEBM Moves**

The new address for the Society for Experimental Biology and Medicine is 162 West 56th Street, Suite 203, New York, NY 10019. Tel: 212-541-7855; fax: 212-541-1503. Contact Felice O'Grady, administrator, for more information about the move.

## American Society of Zoologists Meeting

The 1993 Annual Meeting of the American Society of Zoologists is December 26–30, 1993 in Los Angeles, CA. For meeting information contact American Society of Zoologists, 401 North Michigan Avenue, Chicago, IL 60611-4267. Tel: 312-527-6697; fax: 312-245-1085.

## Integrative Study in Physiology and Medicine

The Integrative Study in Physiology and Medicine interest group held its 8th Annual Workshop at the New Orleans Hilton on March 27 and 18, 1993. For more information about integrative study, see the article by Joseph Engelberg in *The Physiologist* 34: 320-321, 1991. A report of the workshop and a packet of materials may be obtained from Roger Thies, Department of Physiology, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73190. Fax: (405) 271-3181. The group will meet again next year (April 23 and 24, 1994) before the experimental Biology '94 meeting in Anaheim.

### Space Station Conference on Hold

NASA has decided to postpone indefinitely the Space Station Freedom Utilization Conference because of a recent White House directive instructing NASA to redesign the space station. The conference was originally scheduled for June 21–24, 1993.

For more information contact Barry Epstein, User Development Program Manager in NASA's Space Station/Spacelab Utilization Program at (202) 358-4434.

### **1995 APS Conferences**

Understanding the Biological Clock: From Genetics to Physiology Organized by Jay C. Dunlap and Jennifer J. Loros (Dartmouth)

New Discoveries Within the Pancreatic Polypeptide Family: Molecules to Medicine Organized by William Zipf (Children's Hospital, Columbus), Ian Taylor (Duke), Claes R. Wahlestedt (Cornell), Richard Rogers (Ohio State), and Helen J. Cooke (Ohio State)

## **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

Cellular, Biochemical and Molecular Aspects of Reperfusion Injury, New York, July 11–14, 1993. Information: Conference Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021. Tel: (212) 838-0230; fax: (212) 838-5640.

Third Meeting of the International Carbonic Anhydrases Group, Oulu, Finland, July 12–15, 1993. Information: Susanna Dodgson, Department of Physiology, University of Pennsylvania School of Medicine, Philadelphia, PA 19104-6085. Tel: (215) 898-3060, (215) 898-9125; fax: (215) 573-5851.

Society of General Physiologists 47th Annual Symposium, Woods Hole, MA, September 8–11, 1993. *Information:* Society of General Physiologists, PO Box 257, Woods Hole, MA 02543.

Second International Congress of the International Society for Neuroimmunomodulation, Paestum (Salerno) Italy, September 12–17, 1993. *Information:* Nicola Fabris, c/o UP Service Srl, PO Box 336, 60100 Ancona, Italy. Tel: 39-71-206237; fax: 39-71-200527.

Principles and Practice of Tracer Methodology in Metabolism, Galveston, TX, September 19–23, 1993. *Information:* Tracer Methodology Meeting, University of Texas Medical Branch, Box 55176, Galveston, TX 77555-5176. Tel: (409) 770-6628, (409) 770-6605; fax: (409) 770-6825.

Biomedical Engineering Society Annual Fall Meeting, Memphis, TN, October 21–24, 1993. *Information*: Melanie James, Engineering Technology Bldg, Room 330, Memphis State University, Memphis, TN 38152. Tel: (901) 678-3733.

North American Society for Pediatric Gastroenterology and Nutrition Annual Meeting, Chicago, IL, November 5–6, 1993. *Information:* NASPGN Registration Manager, SLACK, Inc., 6900 Grove Road, Thorofare, NJ 08086-9447. Tel: (609) 848-1000.

5th International Symposium on Adenosine and Adenine Nucleotides, Philadelphia, PA, May 9–13, 1994. Information: Secretary, 5th Annual Symposium, PO Box 933, Haverton, PA 19083.

IFAC Symposium on Modeling and Control in Biomedical Systems, Galveston, TX, March 27–30, 1994. Information: IFAC Biomedical Symposium, University of Texas Medical Branch, Box 55176, Galveston, TX 77555-5176. Tel: (409) 770-6628, (409) 770-6605; fax: (409) 770-6825.

## Make Travel Plans to International Congress in Glasgow

There is still time to make your travel plans to Glasgow for the IUPS Congress, August 1-6. We have an excellent selection of hotel rooms, in a good price range and convenient to the Congress Center. You will receive immediate confirmation for the hotel of your choice from our list.

Special air fares are available on Northwest Airlines, British Airways, and American Airlines.

Ask for details on our exciting tour packages for London and tour of Britain.

Please contact the Ambassador Chevy Chase Travel: 1-800-424-8282, 1-800-656-1700; fax: 1-301-907-4787.

### **Dautrebande Prize**

The Triennnial Prize of the Dautrebande Foundation will be granted in 1994 for work on human or animal clinical physiopathology, such work preferably having therapeutic implications.

For more information contact the President of the Foundation, Dr. Stalport, "Maison Batta", 3 Avenue Batta—B.4500 HUY—Belgium.