THE PHYSIOLOGIST

A Publication of the American Physiological Society Volume 35, Number 6 December 1992

Use of Animals in Medical Education

Douglas E. Kelly
Associate Vice President for Biomedical Research
Association of American Medical Colleges

Much anecdotal information has been exchanged in recent years concerning the degree to which medical schools do or do not utilize live animals in the course of their instruction of undergraduate medical students. To gain an accurate assessment of this issue, the Association of American Medical Colleges (AAMC) has recently undertaken a several-phase survey of all 126 accredited medical schools in the United States.

A study conducted by the AAMC in 1985 and published in a Congressional report (1) showed that in a small sample of medical schools, animal use in instruction was widespread but largely restricted to a few disciplines: pharmacology, surgery, and physiology. A survey of physiology departments (2) (also included in the Congressional report) revealed that 6 of 65 reporting units had discontinued animal laboratories during the preceding 10 years. Still, more than 80% of respondents had retained dog or other animal exercises in their curriculum. In 1988, Barnard et al. (3) sampled physiology, pharmacology, and surgery departments in US medical schools and reported data suggesting that at least half of all medical schools then maintained laboratories using animals in one or more of these disciplines.

In the present survey, 92 of 126 medical schools (73%) report utilizing live animal laboratories at some point in their regular curriculum. Sixty-one of those 92 schools offer alternative exercises for students who object to direct participation. However, when queried in a subsequent telephone survey, those 92 schools also reported that 90%–95% of their students elected to participate in the regular live animal exercises. Refusal to attend sessions in which live animals are used will affect an individual's candidacy for admission to or promotion through the medical program in 22 schools.

These figures leave 34 schools that report no current use of live animals in their regular medical curriculum. A third recently completed telephone survey sought to determine why those 34 schools had discontinued or never initiated animal use and what alternatives they regard as sufficient to replace those exercises.

No single answers characterized any of the decisions to move away from animal use. However, over half of the schools cited the increasing expense of animals and equipment or lack of funds to replace outdated equipment as the primary reasons. Six schools reported having converted the relevant laboratories to research space. Nearly half of the schools noted pressures on curricular or faculty time coupled with an increasing emphasis on research functions over educational missions. It is clear from these and other responses that increased curricular attention devoted to cell and molecular biology, earlier introduction to patient contact, and the need to include semiclinical subjects (e.g., nutrition, drug abuse) in basic science years of the curriculum have played strong roles in discouraging laboratory exercises of all types—not just laboratories utilizing animals. The near-dou-

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The Physiologist
Published bimonthly and distributed by
The American Physiological Society
9650 Rockville Pike
Bethesda, Maryland 20814-3991
ISSN 0031-9376

Subscriptions: Distributed to members as part of their membership. Nonmembers in the USA: individuals $25.00; institutions $33.00. Nonmembers elsewhere: individuals $35.00; institutions $44.00. Single copies and back issues when available, $10.00 each; single copies and back issues of Abstracts issue when available, $20.00. In 1992, subscribers to *The Physiologist* will receive it and the abstracts of the Fall Conferences of the American Physiological Society. The American Physiological Society assumes no responsibility for the statements and opinions advanced by contributors to *The Physiologist.*

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

Headquarters phone: 301-530-7164. Fax: 301-571-1814.

MEDICAL EDUCATION
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bling of medical class sizes since 1970 was also noted by several schools as presenting an environment that discouraged highly complex laboratory exercises. This factor probably relates to most schools.

The 34 schools included institutions ranging widely in their missions or emphases. Two schools pointed out that their emphasis in producing primary care physicians precluded the need to concentrate on the principles gained from live animal laboratories. By contrast, two research-intensive medical schools noted that medical student involvement in individual research projects gave them adequate first-hand experience dealing with living animals in a research protocol.

One of the most interesting observations alluded to by several schools was that students have become decreasingly proficient in the laboratory skills necessary to undertake successful animal exercises and that increasingly faculty have also lost those skills.

Only two schools indicated that pressure from animal rights activists played any role in discontinuation of animal laboratories. Likewise, two schools indicated that student complaints played a strong role. One school indicated its intention to reinstate animal laboratories.

With regard to alternatives utilized by the 34 schools, three-fourths indicated extensive use of videotapes of laboratory exercises, video disc simulations, and (especially) computer modeling. Six schools each have come to rely on small group discussions (including problem-based learning) or the use of students as the subjects of experiments (exercise physiology, diuresis, blood analysis, EKG, etc.). Two schools mentioned the fact that basic surgical skills (e.g., suturing) are now introduced utilizing fresh animal tissue (e.g., pig's feet).

Taken together this information allows one to construct a number of scenarios that have influenced the 34 schools. At one extreme, research-intensive institutions, deeply involved in the explosion of new biology and technology and highly dependent on research funding since the 1960s, have found it desirable to convert teaching space to research laboratories and encourage curricular structure that has preserved faculty time for research activity and competition for funding. Their students can find an outlet for laboratory experiences (often involving animals) in the research venue. At the other extreme, some institutions less devoted to research and founded for, or recently dedicated to, the production of a large proportion of primary-care physicians among their graduates argue that the use of laboratory animal exercises is superfluous for the development of the empathetic skills they wish to emphasize. Many schools present intermediate rationales.

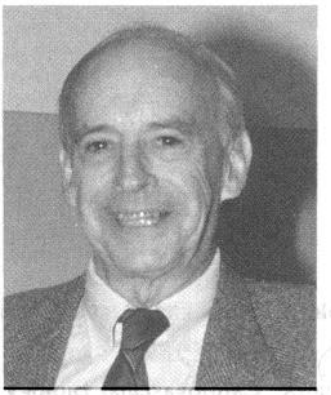
The response to the survey illustrates well that there is no single mission or product that is characteristic of all or perhaps even a majority of the medical schools. Moreover one detects a variety of trends and pressures that have influenced curricular design during and since major curricular revisions initiated in the late 1960s. Many of them have discouraged laboratory

Thank You!

The October issue of *The Physiologist* carried an Opinion piece written by William (Bill) M. Samuels, APS Public Affairs Officer, designed to place some "Footnotes" on the Society's role in the passage of two Acts impacting on the efforts of the animal rights movement. While Bill's recollections are essentially correct, they do not adequately reflect the role he played in the passage of the Food Security Act of 1985 and the Animal Enterprise Act of 1992.

Without the excellent staff work of Bill Samuels on this legislation, as well as many other public affairs efforts, the Society could never have made the positive impact alluded to in his Opinion piece. As always, Bill has allowed the Society to gain the accolades for an action instead of accepting any of the honors for himself.

Bill arrived at APS in 1981 to coordinate the Society's response to the animal rights movement and the break-in of Ed Taub's laboratory in Silver Spring, Maryland. Bill's employment arose from the fact that our FASEB sister societies did not believe that the animal rights movement was a significant threat to their members. The APS Council did find the movement a threat and hired the former executive director of the National Society for Medical Research, a precursor of the National Association for Biomedical Research, as its public affairs consultant. Over the years, Bill focused the Society's attention on the animal issue through his reports in *The Physiologist*, mailings to the membership, and his brochure "How to Be Heard on the Hill." He also kept us informed in the areas of biomedical research appropriations, fetal tissue research, and scientific misconduct. He coordinated the public affairs activities of the APS Centennial celebration, including our visit with then Vice President George Bush. Bill was the ace reporter for *The Physiologist*, drawing on his experience as a reporter and managing editor of The Courier-Journal newspaper of Louisville, Kentucky.



When I arrived at APS in 1985, I discovered in Bill an individual knowledgeable in the ways of associations and an individual who was most helpful to me as I made the transition from an NIH health scientist administrator to APS Executive Director. I also found in Bill an individual who could guide me through the tunnels in the basement of the Capital as we attempted to provide our elected representatives with the Society's opinions.

Public accolades are something that Bill has always shunned. However, in light of his recent announcement to Council that he planned to retire from APS and fly off with his wife to become Florida snowbirds, I believe that this opinion piece is warranted.

Those of us who have worked with Bill over the years appreciate his efforts, and those who have not had the pleasure of working with Bill have benefited from his efforts. For that reason, I would like to say thank you, Bill, for all that you have done for the Society. And as Stan Schultz and the Council said in Colorado Springs, may your retirement present you with a kaleidoscope of opportunities.

Thank you, Bill—we will miss you!

Martin Frank

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experiences of nearly all kinds for medical students during the past 20 years. Still, nearly three-fourths of the medical schools find value in the utilization of live animals during at least some part of their regular medical curriculum. Their activities have increasingly come under the scrutiny and control of local animal care and use committees to ensure humane practices. One can probably expect some shifts as alternatives are tried and adopted or rejected. Under these circumstances, it seems clear that medical school faculty have and will continue to utilize many talents and approaches to provide the requisite training for the many types of physicians required by society.

Proceedings of a conference on "Animal Care and Use Programs: Regulatory Compliance and Education in an Age of Fiscal Constraint." March 21–22, 1991, Boston, MA. Reprinted with permission from PRIM&R.

The assistance of Daria Chapelsky and Jennifer Sutton in conducting the survey is gratefully acknowledged.

References

1. Office of Technology Assessment, US Congress: *Alternatives to Animal Use in Research, Testing and Education* (OTA BS 273). Washington, DC: US Government Printing Office, 1986.

2. Greenwald, G. S.: ACDP survey on use of animals in teaching physiology. *The Physiologist* 28: 478–479, 1985.

3. Barnard, N. D., J. Stolz, and L. Baron: Use of and alternatives to animals in laboratory courses at U.S. medical schools. *J. Med. Educ.* 63:720-722, 1988.

Meetings

Experimental Biology '93

New Orleans, Louisiana
March 28–April 1

Molecular and Cellular Mechanisms of Baroreceptor Reflex Control

Themes: Cardiovascular Biology and Neuroregulation

Sponsors: APS Cardiovascular and Neural Control & Autonomic Regulation Sections
Chairs: F. M. Abboud and D. L. Kunze

Mechanosensitive ion channels: toward a molecular understanding. C. Kung (University of Wisconsin)
Studies on isolated baroreceptor neurons from nodose ganglia. G. Hajduczok (SUNY at Buffalo)
Baroreceptor adaptation and paracrine modulation of baroreceptor activity. M. W. Chapleau (University of Iowa)
Transmitter modulation of ionic currents of baroreceptor neurons. D. L. Kunze (Baylor College of Medicine)
Presynaptic modulation of baroreceptor inputs to NTS. M. C. Andresen (Oregon Health Sciences University)

Protein Phosphorylation During Smooth Muscle Contraction

Theme: Cardiovascular Biology

Sponsor: APS MyoBio Group
Chair: M. Bárány

Protein phosphorylation during the contraction-relaxation-contraction cycle of arterial smooth muscle. M. Bárány and K. Bárány (University of Illinois, Chicago)
Modulation of the Ca^{2+}-sensitivity of myosin light chain phosphorylation and the 4-state cross bridge model for contraction. R. A. Murphy (University of Virginia Health Sciences Center)
Ca^{2+}-dependent phosphorylation of myosin light chain kinase decreases the Ca^{2+} sensitivity of smooth muscle contractile elements. K. E. Kamm (University of Texas Southwestern Medical Center)
Protein kinase C and smooth muscle contraction. K. G. Morgan (Harvard Medical School)
Identification and activity of Ca^{2+}/calmodulin-dependent protein kinase II activities in arterial smooth muscle. H. A. Singer (Geisinger Clinic, Danville, PA)
Expression and regulation of non-muscle and smooth muscle myosin heavy chains. R. S. Adelstein (National Institutes of Health)

Urinary Concentrating Ability of the Kidney: A Comparative Approach

Sponsor: APS Comparative Physiology Section
Chairs: E. J. Braun and C. A. Beuchat

Perspectives on the anatomy of the mammalian kidney as it relates to the urinary concentrating process. I. Sperber (Swedish University of Agricultural Sciences, Uppsala)
The development of current models of the countercurrent multiplier. R. L. Jamison (Stanford University)
Role of the renal pelvis and urea in the concentrating mechanism. B. Schmidt-Nielsen (University of Florida)
The avian renal medulla as a simple case of the urine concentrating mechanism. E. J. Braun (University of Arizona)
Medullary tissue metabolism, body size and urine concentrating ability. L. W. Greenwald (Ohio State University)
The allometric scaling of urine concentrating ability in mammals and birds. C. A. Beuchat (San Diego State University)

Remodeling of the Extracellular Matrix of the Heart and Vessels

Theme: Cardiovascular Biology

Sponsor: APS Cardiovascular Section
Chair: J. W. Covell

Remodeling of the extracellular matrix of the heart and vessels: role of metalloproteinases. J. F. Woessner, Jr. (University of Miami)
Intracellular procollagen degradation. A. M. Samarel (Loyola University)
Role of integrins in the organization of the extracellular matrix. T. K. Borg (University of South Carolina)
Ischemia induced changes in the extracellular matrix. S. M. Factor (Albert Einstein College of Medicine)
Remodeling of the vascular extracellular matrix. M. Rabinovitch (University of Toronto)

Tutorial: **Strategies for the Study of Gene Expression and Its Regulation**

Themes: Epithelial Cell Biology and Mechanisms of Molecular Regulation

Sponsor: APS Renal Physiology Section
Chair: L. Ercolani

Strategies for studying transcriptional regulation in vivo. B. Wold (California Institute of Technology)
Protein-protein interactions in the function of the myo oncogene. R. N. Eisenman (F. Hutchinson Cancer Center)
Prokaryotic genetic systems for the analysis of eukaryotic gene transcription. D. M. Moore (Harvard University)
SELEX, RNA, and the shape of things to come. L. Gold (University of Colorado)

The L-Arginine/Nitric Oxide Pathway and Renal-Cardiovascular Integration

Theme: Cardiovascular Biology

Sponsors: APS Water & Electrolyte Homeostasis and Renal Physiology Sections
Chairs: R. H. Freeman and W. H. Beierwaltes

Nitric oxide as a renal paracrine/autocrine signaling mechanism. B. J. Ballerman (Johns Hopkins University)
Nitric oxide and control of renal function. J. C. Romero (Mayo Medical School)
Nitric oxide and control of single nephron function. C. Baylis (West Virginia University)
Analogues of L-arginine and control of renin release. R. H. Freeman (University of Missouri)
Role of the endothelium in hypertension. W. H. Beierwaltes (Henry Ford Health Sciences Center)

Calcium: From Calcium-Transporting Proteins to Renal Calcium Transport

Theme: Epithelial Cell Biology

Sponsor: APS Renal Physiology Section
Chair: P. A. Friedman

Types of voltage dependent calcium channels. B. Bean (Harvard Medical School)
Calcium entry channels in kidney epithelial cells. P. A. Friedman (Dartmouth Medical School)
Molecular aspects of sodium-calcium exchange. K. D. Philipson (UCLA)
Sodium-calcium exchange in renal epithelia. E. E. Windhager (Cornell University Medical College)
Molecular characterization of intracellular calcium pumps. J. Lytton (Brigham & Women's Hospital and Harvard Medical School)
Calcium pumps and calcium-binding proteins in the kidney. R. Kumar (Mayo Medical School)

Cardiorespiratory Interactions During Sleep

Theme: Cardiovascular Biology and Neuroregulation

Sponsor: APS Subcommittee on Clinical Physiology
Chairs: C. Gaultier and L. B. Rowell

Neurobiology of brain-stem cardiopulmonary control mechanisms. P. Guyenet (University of Virginia Health Sciences Center)
Mechanical heart-lung interactions. J. Rodarte (Baylor College of Medicine, Texas Medical Center)
Influence of sleep state on the control of breathing. A. I. Pack (University of Pennsylvania Medical Center)
Influence of breathing and sleep state on cardiovascular function. C. Guilleminault (Stanford University)
Cardiovascular control in sleep apnea patients. P. Escourrou (Paris XI University, France)
Developmental aspects of cardiorespiratory interactions during sleep. G. Haddad (Yale University)

Physiological Adaptations and Countermeasures to Long-Duration Space Flight

Theme: Cell Injury

Sponsor: APS Environmental & Exercise Physiology Section
Chairs: A. R. Hargens and C. M. Tipton

Cardiovascular system and fluid shifts.. A. R. Hargens (NASA-Ames Research Center)
Russian experience with long-duration space flight. I. B. Kozlovskaya (Russian Ministry of Health, Moscow)
Neuromuscular system. V. R. Edgerton (UCLA)
Bone. V. Schneider (NASA-Johnson Space Center)

APS Bowditch Lecture

Monday, 5:15 pm

"Leukocyte Transit Through the Lungs"

Claire M. Doerschuk, Indiana University

Space radiation. G. A. Nelson (Jet Propulsion Laboratory, Pasadena, CA)
Artificial gravity. J. Vernikos (NASA-Ames Research Center)
Summary of mechanisms and countermeasures. C. M. Tipton (University of Arizona)

Imaging Techniques for Assessing Cell Function

Sponsor: APS Education Committee
Chairs: F. S. Fay and L. J. Heller

Fluorescent analogs as tools for study of cytoskeletal structure. D. L. Taylor (Carnegie-Mellon University)
Fluorescent indicators and caged compounds as tools for study of signal transduction. R. Y. Tsien (UCSD)
Optical trapping as a tool for studying molecular motors. J. Finer (Stanford University)
The digital imaging microscope as a tool for study of local molecular changes underlying cell function. F. S. Fay (Massachusetts Medical School)

Expression of Transport Proteins in Heterologous Systems: What Can This Tell Us About Structure-Function Relationships?

Theme: Epithelial Cell Biology

Sponsors: APS Cell & General Physiology Section, APS Epithelial Transport Group, and The Society for General Physiology
Chairs: P. A. Knauf and J. R. Riordan

The anion exchanger gene family. R. Kopito (Stanford University)
The study of band 3 mediated anion exchange by means of site-directed mutagenesis: a summary of recent experiences. H. Passow (Max-Planck-Institute for Biophysics, Frankfurt, Germany)
Molecular biology of the sodium-proton exchanger. J. Pouyssegur (University of Nice, France)
Expression of sodium sugar cotransporters in Xenopus oocytes. E. M. Wright (UCLA)
Consequences of CF-associated mutations on CFTR. M. J. Welsh (University of Iowa)
Properties of CFTR expressed in baculovirus infected insect cells. J. R. Riordan (Hospital for Sick Children, Toronto)

Leukocyte Adhesion in the Presence of Shear Stress: Mechanics and Molecules

Theme: Cardiovascular Biology

Sponsor: APS Cardiovascular Section
Chairs: K. Ley and C. W. Smith

Introduction. S. Chien (UCSD)
The contribution of leukocyte deformability to leukocyte-endothelial adhesion. H. H. Lipowsky (Pennsylvania State University)
Adhesion force of leukocytes in venules. G. W. Schmid-Schönbein (UCSD)
The selectins and ß2-integrins in leukocyte adhesion under conditions of flow. C. W. Smith (Baylor College of Medicine)
P-selectin versus ICAM-1 mediated adhesion: differential role in presence of shear stress. M. B. Lawrence (Harvard Medical School Center for Blood Research)
Role of selectins for leukocyte rolling and adhesion in vivo. K. Ley (Free University of Berlin, Germany)
Modeling mechanical behavior based on molecular data: making both worlds meet. A. Tözeren (Catholic University of America, Washington, DC)

Vesicle-Mediated Transporter Redistributions in Regulation of Epithelial Transport

Theme: Epithelial Cell Biology

Sponsors: APS Cell & General Physiology Section and Epithelial Transport Group
Chairs: A. K. Mircheff and J. G. Forte

Parietal cell membrane recycling: synthetic and secretory turnover. J. G. Forte (University of California, Berkeley)
Water channels and proton-translocating ATPase in renal epithelia. D. Brown (Harvard Medical School)
Distribution and redistribution of transport ATPases in the nephron. A. Doucet (College of France, Paris)
Rapid regulation of phosphate transport in renal cells by endocytosis. S. A. Kempson (Indiana University School of Medicine)
Stimulation-induced recruitment of Na,K-ATPase in exocrine acinar cells. A. K. Mircheff (University of Southern California)
Recycling of Cl^- channels. K. L. Kirk (University of Alabama, Birmingham)

Physiology and Pharmacology Disciplines for the 21st Century

Sponsor: APS Education Committee
Chairs: M. Printz and H. Nishimura

Organ system physiology. Coalescence of "new technology" for an integrative approach for cardiovascular physiology. A. W. Cowley (Medical College of Wisconsin)
Educational needs and goals for organ system physiology. M. I. Phillips (University of Florida)
Cell physiology. Inhibition of acid secretion: drug mechanisms by design. G. Sachs (UCLA and Wadsworth VA Medical Center)
Educational needs and goals for cell physiology. W. H. Dantzler (University of Arizona)
Molecular pharmacology. Alpha2 adrenergic receptors: structural basis for multiple functions. L. E . Limbird (Vanderbilt University Medical Center)

Educational needs and goals for molecular pharmacology. J. C. Garrison (University of Virginia Medical School)
Physiological pharmacology. Renal eicosanoids: tissue-specific pathways and functional effects. J. C. McGiff (New York Medical College)
Educational needs and goals for physiological pharmacology. E. H. Blaine (Searle R&D, Monsanto Co.)
Does research drive discipline or does discipline drive research? M. Printz (UCSD)
Future direction of graduate training. W. S. Spielman (Michigan State University and SmithKline Beecham Pharmaceutical)

Charge Translocation by Electrogenic Carriers and Ion Pumps

Theme: Epithelial Cell Biology

Sponsors: APS Cell & General Physiology Section and Epithelial Transport Group
Chairs: R. F. Rakowski and P. De Weer

Charge translocation by the Na/K pump in cardiac myocytes. D. C. Gadsby (Rockefeller University)
Investigation of charge translocation reaction steps of the Na/K pump with optical methods. H.-J. Apell (University of Konstanz, Germany)
Modification of the voltage dependence of the apparent external K+ and Na+ binding affinity of the Na/K pump by alpha-subunit mutations. W. Schwarz (Max-Planck-Institute for Biophysics, Frankfurt, Germany)
Charge movement of partial sodium-transport reactions by the cardiac Na/Ca exchanger and Na/K pump in giant membrane patches. D. W. Hilgemann (University of Texas Southwestern Medical Center, Dallas)
Conformational currents of the Na/Ca exchanger measured by flash photolysis. W. J. Lederer (University of Maryland, Baltimore)
Kinetics of charge translocation by pumps reconstituted in planar bilayers. E. Bamberg (Max-Planck-Institute for Biophysics, Frankfurt, Germany)

Biomedical Research in Developing Countries: Current Problems in Malnutrition

Sponsors: APS International Committee and American Institute of Nutrition
Chairs: D. R. Richardson and K. M. Rasmussen

Iron and trace mineral deficiencies in developing countries. L. H. Allen (University of Connecticut)
Key aspects of protein energy malnutrition in developing countries. F. Viteri (University of California, Berkeley)
Vitamin deficiencies and parasitic diseases in developing countries. A. Tompkins (University of London, UK)
Malnutrition and reproductive performance. K. M. Rasmussen (Cornell University)

Lung Surfactant: Molecular and Cellular Processing

Theme: Epithelial Cell Biology

Sponsor: APS Respiration Section
Chairs: S. A. Rooney and J. R. Wright

Regulatory elements of the SP-A gene that mediate tissue-specific, developmental and hormonal regulation of expression. C. R. Mendelson (University of Texas Southwestern Medical Center, Dallas)
Analysis of the human SP-C promoter and its developmental regulation. S. W. Glasser (University of Cincinnati)
Roles of hydrophilic surfactant proteins in surfactant secretion and recycling in alveolar type II cells. T. Akino (Sapporo Medical College, Japan)
Signal-transduction mechanisms regulating surfactant phospholipid secretion. S. A. Rooney (Yale University)
Multiple roles of GTP-binding proteins in surfactant secretion. L. Dobbs (UCSF)
Membrane fusion in lung surfactant secretion. A. Chander (Thomas Jefferson University)
Intracellular processing of recycled components of pulmonary surfactant. S. L. Young (Duke University)

Respiratory Physiology: Historical Perspectives

Sponsor: APS History of Physiology Group
Chair: G. Sant'Ambrogio

Historical development of respiratory mechanics. A. Otis (University of Florida)
Historical developments of our knowledge on lung microvasculature-fluid balance. N. C. Staub (UCSF)
Ventilation/perfusion relationship and gas exchange: historical perspectives. J. B. West (UCSD)
Oxygen toxicity: from the breath of life to free radicals. D. L. Gilbert (National Institutes of Health)
Control of breathing: historical perspectives. J. G. Widdicombe (St. George's Hospital Medical School, London, UK)

Regulation of Myocardial Substrate Metabolism

Theme: Cardiovascular Biology and Metabolism

Sponsor: APS Endocrinology & Metabolism Section
Chairs: W. C. Stanley and R. S. Balaban

Control of cardiac function by substrate flux through Krebs cycle spans: importance of anaplerosis. H. Taegtmeyer (University of Texas, Houston)
The role of substrate in oxidative phosphorylation. R. S. Balaban (National Heart, Lung, and Blood Institute, National Institutes of Health)
Myocardial carbohydrate metabolism in humans. J. A. Wisneski (UCSF)

Physiology in Perspectives: Walter B. Cannon Memorial Lecture

Wednesday, 5:15 pm

"Potassium Homeostasis: Regulation Through Pumps and Channels"

Gerhard Giebisch, Yale University

Supported by The Grass Foundation

Regulation of myocardial protein metabolism by insulin. L. H. Young (Yale University)
Regional glycolytic metabolism during myocardial ischemia. W. C. Stanley (Syntex Research, Palo Alto, CA)
Substrate utilization in reperfused myocardium. A. J. Liedtke (University of Wisconsin, Madison)

Humoral Modulation of Pulmonary Vascular Resistance During Hypoxia

Theme: Cardiovascular Biology

Sponsors: APS Hypoxia Group, Respiration Section, and Cardiovascular Section
Chairs: B. R. Walker and P. A. Murray

Mechanism of vasopressinergic pulmonary vasodilation. B. R. Walker (University of New Mexico)
Pulmonary vasodilatory response to ANP during hypoxia. S. Oparil (University of Alabama, Birmingham)
EDRF as a modulatory of hypoxic pulmonary hypertension. I. F. McMurtry (University of Colorado)
Pulmonary vascular response to endothelin during hypoxia. H. L. Lippton (LSU Medical Center)
Regulation of pulmonary vascular tone and remodeling by angiotensin II. M. Rabinovitch (University of Toronto)
Anesthetic modulation of humoral control of the pulmonary circulation. P. A. Murray (Johns Hopkins University)

Mechanical Force Regulation of Gene Expression in Vascular Cells

Theme: Cardiovascular Biology

Sponsor: Biomedical Engineering Society
Chair: J. A. Frangos

Gene regulation by mechanical stimulation of cardiac myocytes. S. Izumo (Beth Israel Hospital)
Role of second messenger systems in coupling cyclic strain with gene expression in vascular cells. B. Sumpio (Yale University Medical School)
Characterization of shear stress responsive elements regulating endothelial gene expression. M. Gimbrone and N. Resnick (Harvard Medical School)
Flow effects on endothelial cell growth program. B. Berk (Emory Medical School)
Endothelial gene expression in laminar and complex flows. S. Diamond (SUNY at Buffalo)
No synthase, endothelin, and proto-oncogene expression in endothelial cells subjected to flow. J. A. Frangos (Pennsylvania State University)

Rheology of Metastasis

Sponsor: North American Society of Biorheology
Chairs: H. L. Goldsmith and D. A. Hammer

Morphology, geometry and rheological properties of hybrid cells through the cell cycle. D. Needham (Duke University)
In vitro adhesion of transformed cells: role in metastasis formation. K. Ward Anderson (University of Kentucky)
Adhesion of a metastatic cancer cell line to organ-conditioned endothelia under shear flow. D. A. Hammer (Cornell University)
Some factors influencing the lodgment and survival of cancer cells in the microcirculation. U. Bagge (University of Gôteborg, Sweden)
Deformation and destruction of cancer cells in microcirculation. L. Weiss (Roswell Park Cancer Institute, Buffalo, NY)
Cancer cell traffic through the liver microcirculation. E. Barberá-Guillem (University of Valencia, Spain)
Role of rheology of cytotoxic lymphocytes in immunotherapy. R. Jain (Harvard Medical School)

Biofunctional Materials for Tissue Engineering

Theme: Cardiovascular Biology

Sponsor: Biomedical Engineering Society
Chairs: J. A. Hubbell and W. M. Saltzman

Soft-tissue response to biomaterials modified with RGD-containing peptides. J. R. Glass (Telios Pharmaceuticals, Inc.)
Cell and tissue interactions with designed protein polymers. J. Cappello (Protein Polymer Technology Inc.)
Development of artificial extracellular matrices based on the immobilization of peptidic fragments to hydrogel backbones. P. Aebischer (Brown University)
Peptide grafted materials for tissue engineering in the vascular graft. J. A. Hubbell (University of Texas, Austin)
Carbohydrate grafted materials for hepatic tissue engineering. W. M. Saltzman (Johns Hopkins University)
Role of stress in matrix regultion. F. Grinnell (University of Texas Southwestern Medical Center, Dallas)

In Search of a Hepatic Stem Cell

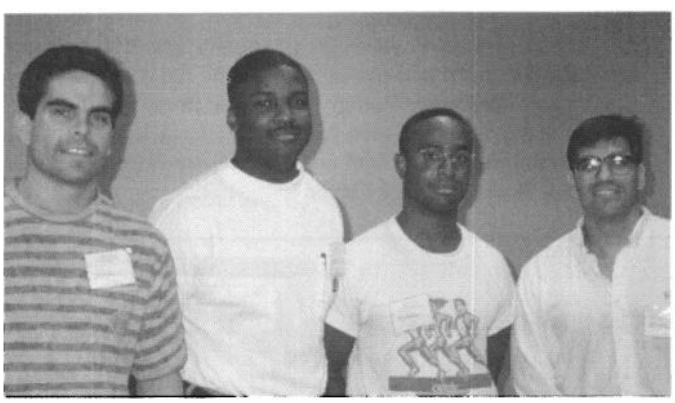
Sponsor: Society for Experimental Biology in Medicine
Chair: D. A. Shafritz

Cell lineages in hepatic development and the identification of progenitor cells in normal and injured liver. N. Fausto (Brown University)
Progenitor cell identification and activation in various models of liver injury and hyperplasia. D. A. Shafritz (Albert Einstein College of Medicine)
Cellular and molecular biology of the hepatic stem cell. S. S. Thorgeirsson (National Institutes of Health)
Isolation and characterization of candidate liver stem cell. L. M. Reid (Albert Einstein College of Medicine)
Isolation, culture and transplantation of rat hepatocyte precursor (stem-like) cells. J. W. Grisham (University of North Carolina)
Phenotypic heterogeneity within clongenic cell populations isolated from normal adult liver. D. C. Hixson (Rhode Island Hospital)

APS Past-President's Workshop: Physiology for High School Teachers and Students

Chair: N. C. Staub

1992 APS Conference: Colorado Springs



NIDDK Fellows.

Recipients of the Hermann Rahn Student Awards.

1992 APS Conference: Colorado Springs

Pikes Peak, the Garden of the Gods, and the golden aspens of Colorado served as a backdrop for the APS Conference, "Integrative Biology of Exercise." Organized by Peter D. Wagner, James H. Jones, Jere H. Mitchell, Charlotte A. Tate, Ronald L. Terjung, and Tony G. Waldrop, the Conference featured an outstanding program that drew on the expertise of the APS and American College of Sports Medicine (ACSM) to focus on all aspects of exercise physiology.

The organizing committee for the Colorado Springs Conference, held September 23–26, 1992, focused on the "Integrative Biology of Exercise." The scientific program consisted of 14 symposia, 5 tutorials, as well as a keynote lecture and a debate, which focused on the physiological and biochemical aspects of exercise. In addition, 406 abstracts were submitted to the Conference and presented in 28 poster sessions.

The sponsors of the submitted abstracts were equally divided between APS and ACSM members. APS members sponsored 162 abstracts, and ACSM members sponsored 164 abstracts. In addition, 80 abstracts were submitted by individuals holding membership in both APS and ACSM. Table 1 provides the distribution of abstracts based on submitting department. Seventeen percent of the abstracts were derived from departments of physiology, and 26% were submitted from departments directly related to exercise (i.e., kinesiology, physical education, sports medicine). Women were first authors on 80 abstracts (20%), and scientists residing outside of the Americas accounted for 83 abstracts (20%). Scientists from industry submitted 5 abstracts (1%), and those from government laboratories submitted 14 abstracts (3%).

The 812 attendees (Table 2) were able to capture the spirit of the Old West during the Conference party held at the Flying W Ranch. Attendees were able to wander through an old west town consisting of a blacksmith shop, adobe jail, post office, and shops. Cowboys served beverages from the chuckwagons scattered throughout the town. In addition to

Table 1. Departmental Distribution of Submitted Abstracts

Department	Number (%)
Physiology	69 (17%)
Kinesiology	23 (6%)
Sports Medicine/Science	22 (6%)
Exercise Science	19 (5%)
Exercise Physiology	15 (4%)
Human Performance Lab	14 (3%)
Physical Education	14 (3%)
Medicine	12 (3%)
Biological Sciences	11 (3%)
Other	73 (18%)

Table 2. Registration Statistics

Members	432
Nonmembers	117
Students	226
Retired	6
Scientific Registration	781
Guest	10
Exhibitors	20
Press	1
Total Registration	812

the old town atmosphere, the attendees were served a western barbecue and were entertained by the Flying W Wranglers, a cowboy band that was the highlight of the western stage show.

The APS Banquet featured a presentation by Sir Roger Bannister and presentation of the student awards. Sir Roger reminisced about his efforts to break the four-minute mile and discussed the impact of current training programs on the attainment of future world records. The organizing committee also recognized the achievements of 10 graduate students selected for their outstanding work from 74 abstracts submitted for the Hermann Rahn Student Awards. These outstanding young physiologists received a certificate and a check for $500. The recipients of the student awards were Leonard P. Andres, Harvard School of Public Health; David J. Dyck, University of Guelph; Ken D. Sumida, University of Southern California; Carol E. Torgan, University of Texas, Austin; Alan Hayes, University of Melbourne, Australia; Kristen Ann Luckin, University of Oregon; Kurt W. Saupe, University of Wisconsin; Bradley D. Williams, University of Texas, Galveston; Donald G. Welsh, University of Guelph; and Scott D. Nichols, Northern Arizona University.

The Society also continued the APS/NIDDK Minority Travel Fellowship Program for underrepresented minorities. Five Fellows attended as guests of the APS and NIDDK, receiving complimentary registration and reimbursement for travel and per diem expenses. The awardees for this Conference included Michael A. Dray, University of California, San Diego; Jamil Jacobs-El, University of Illinois at Chicago; John H. Lawrence III, Emory University; Oscar Suman-Vejas, University of Wisconsin; and Jorge Martin Uribe, University of California, San Diego.

For those attendees who wanted to get a closer look at the area surrounding Colorado Springs, the Society also organized a Sunday morning bus tour of Pikes Peak, America's most famous mountain, rising 14,110 feet above sea level. A landmark for Indians and conquistadors, the Peak became famous when it was named for Zebulon Pike, who discovered it in 1806. Katherine Lee Bates wrote the words to "America the Beautiful!" after visiting the summit in 1893.

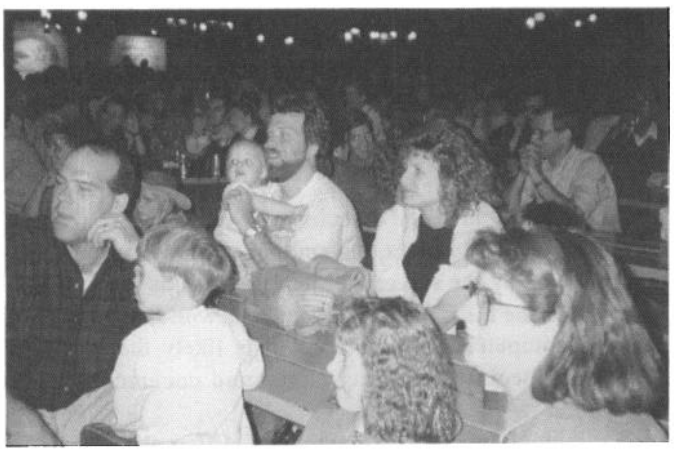
Overall, the APS Conference on the "Integrative Biology of Exercise" was an outstanding scientific success. The attendees' opinions of the Conference were so favorable that there was a suggestion made that the Conference be repeated in the future. Unfortunately, that suggestion cannot be pursued by the Society unless the membership submits a proposal for a future conference.

The American Physiological Society gratefully acknowledges contributions in support of the 1992 APS Conference: Integrative Biology of Exercise from the following: Gatorade Sports Science Institute, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), and Naval Health Research Center.

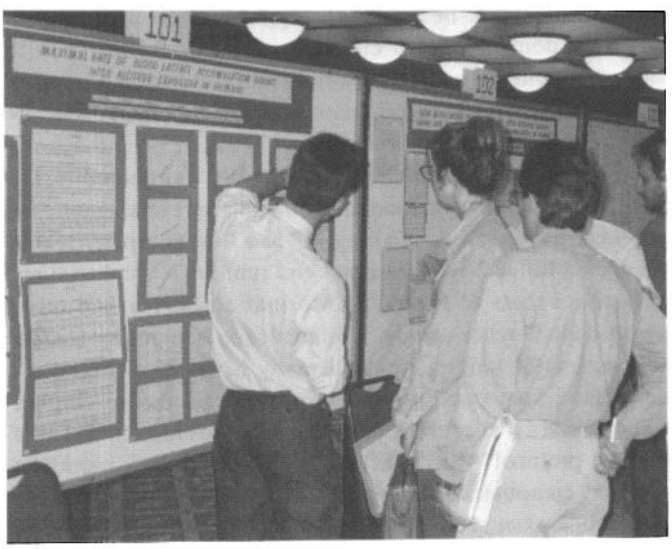
APS Council and Committee Chairpersons

Row 1 (l-r): E. Renkin, M. A. Frey, H. J. Cooke, H. V. Carey, L. G. Navar, S. G. Schultz, W. H. Dantzler, N. C. Staub, E. Ison-Franklin, and D. B. Jennings. Row 2 (l-r): F. G. Knox, A. W. Cowley, Jr., D. J. Ramsay, G. Kaley, S. F. Flaim, F. L. Powell, Jr., J. A. Schafer, C. M. Tipton, L. S. Jefferson, and M. Frank.

Organizing Committee with Sir Roger Bannister. Row 1 (l-r): P. D. Wagner, C. A. Tate, Sir Roger Bannister, R. L. Terjung, and T. G. Waldrop. Row 2 (l-r): J. H. Mitchell and J. H. Jones.



Conference party at Fiying W Ranch.



Poster Session.

Education

Conference on Strategies for Teaching Life Sciences to Undergraduates

What is the role of the life sciences in liberal education and literacy? How can we cope with teaching and assessing the diverse field of biology? What are the pros and cons for survey versus in-depth courses in undergraduate life science education? How do we use new teaching strategies (cooperative learning, concept mapping) and technology (computers, videodisc) effectively in the classroom? Where are the cost-effective, exemplary models for teaching in the life sciences? How do we effect institutional change?

These issues will be addressed at the Conference on Strategies for Teaching the Life Sciences to Undergraduates, sponsored by the Coalition for Education in the Life Sciences. The conference, CELS III, is February 14–17, 1993 at the Marine Biological Laboratory in Woods Hole, MA. The conference objectives are to 1) provide evidence for a undergraduate life science education requirement for all students; 2) identify goals for undergraduate education in teaching the life sciences; 3) increase the visibility of effective strategies and methods used in teaching and assessing undergraduate life science education; 4) facilitate development and implementation of introductory, hands-on, inquiry-driven life science courses for students; and 5) link life science faculty to a national life science education clearinghouse.

Academic personnel (e.g., faculty and staff) from two- and four-year institutions, research scientists, university administrators, business leaders, and public officials concerned about undergraduate life science education should attend.

Tentative agenda includes plenary sessions, life sciences teaching material presentations, workshops, and discussions. The opening session will be held and cosponsored with the American Association for the Advancement of Sciences (AAAS) Annual Meeting in Boston, MA. Workshop topics include revisiting the framework for life sciences education, components of exemplary programs, developing an effective institutional plan, and funding resources. Plenary speakers include John Jungck (Beloit College, WI), Robert Pollack (Columbia University, NY), Barbara Steward (Swarthmore College, PA), Paul Williams (University of Wisconsin, Madison), and others.

The Coalition, representing over 30 life sciences, professional organizations, and institutions, seeks to improve life science education for the public. For more information, contact Amy Chang, American Society for Microbiology, 1325 Massachusetts Ave., Washington, DC 20005; tel: 202-737-3500; fax: 202-737-0233.

Network Distribution of APS Information

The American Physiological Society has created an information server for the electronic distribution of APS information, documents, and publications via the National Research and Education Network (NREN)/Internet. The availability of this server permits the APS to systematically begin integrating its services and publications into the new informational infrastructure being spawned by the United States' *High-Performance* Computing Program.

Access to the APS information server is world-wide. There are over 6,000 networks connected by the NREN/Internet. Of that, approximately two-thirds are domestic and one-third foreign. These networks interconnect over 1 million computers, thus creating a complex meshing of information on professional, technical, as well as recreational subjects. It is projected that this infrastructure will, in only a few years, continue to expand such that individuals may instantly access any known information via their personal computers.

There are numerous advantages to being able to directly access information stored electronically within a world-wide network. Information contained within network archives is immediately available from any workstation connected to the network. Thus one does not have to search for misplaced paper publications nor waste time locating and obtaining documents from remote archives. Updated information is instantly available to anyone accessing the network. Traditional paper publications, on the other hand, are limited in number and can only be updated by printing new versions. The costs and delays associated with printing and distributing new paper versions severely restrict both the frequency and number of updates.

Electronically stored information is also easily processed by automated techniques that facilitate scholarly activities. For example, archives can be rapidly searched using various algorithms to locate specific kinds of information. From there, text or data can be sent to a printer to produce a hard-copy output, incorporated into other documents, mailed electronically to colleagues, and/or manipulated by a visualization program to produce a graphical representations of data.

The APS Information Server uses the Gopher Protocol for Document Distribution developed by the University of Minnesota. It is recommended in the NSF Implementation Plan for Interagency Interim NREN. The protocol is a client/server–based system that allows individuals to use Gopher clients on their computers to access information that is located on numerous servers distributed all over the world. Users access information by simply selecting desired topics from a set of menus. It is neither necessary to know where the server containing the required information is located, nor is it important to know how to establish the required connections. The Gopher client will do this work for the user.

A Gopher client is generally configured to connect to a specific Gopher server once it is activated. Usually this "home" server will be maintained by the institution, company, or organization with which one is closely associated. Once activated, the Gopher client receives an initial menu from the "home" server that permits the user to select from a number of informational categories. One of these categories provides a list of universities and other organizations that distribute information via the Gopher protocol. APS information may be obtained by choosing the "American Physiological Society Information" entry from this list.

Initially, the APS Server contains the information as summarized by the following menu categories or topics:

Welcome: American Physiological Society
- Overview: American Physiological Society
- APS Staff
- Membership Information

Announcements and Meeting Notices
Publication Information
Abstracts of Accepted Manuscripts

Documents initially distributed by the server contain only ASCII text. However, the amount and types of information provided by the server will be expanded as the capabilities of both the NREN and the installed, world-wide base of personal computers are enhanced. It is likely that the APS Server will begin distributing compound documents in the near future.

Individuals may use a number of different methods to access the APS Information Server. For personal computers directly connected to the NREN/Internet, it is recommended that a Gopher client be installed. Using a local client removes the need for a user to log on to a computer system and enables documents to be saved directly on the personal computer. Public domain Gopher clients for DOS, Macintosh, Unix, and other computers systems can be obtained from a number of Internet Archives. Information about these clients is available from the network administrator.

For personal computers not directly connected to the NREN/Internet, a telephone modem and a terminal emulation program may be used. "Calling in" to a host computer that is connected to the NREN/Internet and running a Gopher client will give access to the APS Information Server and other world-wide Gopher clients. The academic computing centers of most major universities and many biomedical organizations have host computers that provide access to Gopher servers. Many academic centers also provide "serial line Internet protocol" (SLIP) access to Internet, which permits a personal computer to function as a full NREN/Internet node via a modem connection.

By implementing the APS Information Server, the

Membership

Proposed Amendments to the APS Bylaws

Emeritus Membership for Corresponding Members

Responding to an inquiry about emeritus membership for corresponding members at the spring meeting, Council recommended that emeritus membership status be extended to corresponding and associate corresponding members.

ARTICLE III. *Membership*

Section 7. *Emeritus Members.* A regular, associate, corresponding, or associate corresponding member may apply to Council for transfer to emeritus membership if that person (1) has reached the age of 65 and is retired from regular employment or (2) has been forced to retire from regular employment because of illness or disability. An emeritus member may be restored to regular membership status on request to Council.

Governance

The Council appointed a Task Force on Governance to consider procedures for the APS Sections to play a major role in the governance of the Society. The recommendation of the Task Force is to enlarge the Nominating Committee to include all sections in the election of the APS Officers.

ARTICLE IV. *Officers*

Section 4.b. *Nominating Committee.* The Nominating Committee shall consist of the immediate Past President, who will serve as Chairperson, and ~~six~~ each member~~s elected from~~ of the Section Advisory Committee ~~according to a rotation plan~~. The Chairpersons of the Program Committee and Publications Committee shall serve as *ex officio* members . . .

Meetings

Because the Society no longer has a fall business meeting and the Council has been authorized to approve the election of regular and corresponding members, it is proposed that Article IX. *Meetings* be amended as follows.

ARTICLE IX. *Meetings*

SECTION 1. *Spring Meeting.* A meeting of the Society for transacting business, electing officers and members, presenting communications, and related activities shall ordinarily be held in the Spring of each year.

~~SECTION 2. Fall Meeting. A Fall meeting of the Society shall be held at a time and place determined by the Council for presenting communications, electing members, and for transacting business. Under exceptional circumstances Council may cancel such a meeting.~~

SECTION ~~3~~ 2. *Special Meetings.* Special Meetings of the Society or of the Council may be held at such times and places as the Council may determine.

SECTION ~~4~~ 3. *Quorum.* At all business meetings of the Society fifty regular members shall constitute a quorum.

SECTION ~~5~~ 4. *Parliamentary Authority.* The rules contained in Roberts Rules of Order, Revised, shall govern the conduct of the business meetings of the Society in all cases to which they are applicable and in which they are not inconsistent with the Bylaws or special rules of order of the Society.

American Physiological Society has demonstrated its recognition that a critical change is taking place in the way scholarly information will be gathered, archived, and disseminated in the future. This recognition and associated actions by the Society will ensure that APS is an active participant in the development of the new National Informational Infrastructure. Active participation by APS in this process will ensure that its membership services are appropriately adapted to this new environment.

B. D. Ardoin and W. A. Weems
University of Texas at Houston
Health Science Center

Caroline tum Suden Award Guidelines Revised

Each year, the Society utilizes funds from the Caroline tum Suden bequest to recognize 6 outstanding pre- and post-doctoral students presenting their research at the spring meeting. Starting with the 1993 meeting, the Society will be providing support for 12 students. The expansion of the program was recommended by Hannah Carey and the Women in Physiology Committee. The Committee has also slightly modified the guidelines to implement the goals of the Society.

The following are the revised guidelines for the review of the abstracts submitted for the Caroline tum Suden Awards.

1) To be eligible for an award, the candidate must either be (a) a student or associate member of the APS; (b) have an advisor who is a member of the Society; or (c) have a supporting sponsor who is a member of the Society.

2) The candidate must submit a completed award certification form, found in the call for papers, which must be included with the abstract.

3) The abstract must be well-written, concise, and include (a) a clearly stated hypothesis or aim; (b) the technical approach to the study; (c) the pertinent results obtained; and (d) a clearly stated conclusion, including the significance of the results to the field.

Porter Physiology Development Program

The Porter Physiology Development Program needs your support. Since 1967, it has provided funds to increase the involvement of minority students in the science of physiology. Recently, the membership received a brochure describing the successful results of the program and a solicitation for support. Many of our members have already responded to the soliciation.

The enclosure of the donation card in this issue of *The Physiologist* is designed to give others an opportunity to make a contribution. Currently, the William Townsend Porter Foundation provides $50,000 in support for the program and the APS allocates $25,000. In addition, the Society has recently solicited funds from a number of corporations to expand financial support for the program. Both the membership and the corporations have an incentive to make a contribution because the William Townsend Porter Foundation has made a matching offer for every additional dollar raised by the APS.

We encourage your consideration of this program and urge you to make a generous contribution to the Porter Physiology Development Fund. Please indicate your desired level of support on the form and return it to APS with your contribution.

The American Physiological Society
Porter Physiology Development Program

Name_____ Home Phone:_____

Address_____ Office Phone:_____

City_____ State_____ Zip_____

[ ] I want to help the American Physiological Society strengthen the Porter Physiology Development Program and to encourage minority participation in the physiological sciences.

I wish to donate

[ ] $25.00 [ ] $50.00 [ ] $100.00 [ ] other_____

I wish to make my contribution by

[ ] check [ ] Visa [ ] MasterCard

_____ _____

Card Number Expiration Date

_____

Signature

Checks should be made to **The APS Porter Physiology Development Program** and returned with this form to The American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991. Contributions to The Porter Physiology Development Program are tax deductible.

Hallowell Davis (1896-1992)

Upon the presentation of the Ray G. Daggs Award in 1991 to Hallowell Davis, it was noted that "when [he] started to make major contributions to both the science of physiology and to the American Physiology Society, most of us here were not yet born."

Davis, who was the Society's 31st President and a member of APS for 67 years, died in August in St. Louis. He was 96.

The New York City native earned both baccalaureate and medical degrees at Harvard University. After graduating from Harvard Medical School in 1922, Davis spent a year in England at Cambridge University, where he became an electrophysiologist.

Davis also taught physiology at Harvard from 1923 to 1946. It was during that period Davis did pioneering work on electroencephalography and first demonstrated the recording of EEG waves on an ink-writing instrument.

He left Harvard for St. Louis to establish a research program and department at the Central Institute for the Deaf. He also was appointed professor of physiology and research professor of otolaryngology at the Washington University School of Medicine with an additional appointment as lecturer in the Department of Speech and Hearing.

Davis played important roles in the Society's development. He served as treasurer from 1942 to 1946, was

elected to Council in 1956, and served as president from 1958 to 1959. He also served on many APS committees, including the Board of Publications Trustees, Membership Advisory Committee, and Senior Physiologist Committee.

At Central Institute, Davis brought a new concept for a research program oriented toward problems of hearing and deafness by combining the scientific methods of electrophysiology, behavioral psychology, and electroacoustic engineering, thereby allowing specialists in those areas to complement each other in finding solutions.

He co-edited with S. Richard Silverman the book *Hearing and Deafness: A Guide for Laymen*, which became a popular textbook for audiologists. He also co-edited with S. S. Stevens the book *Hearing: Its Psychology and Physiology*, in which he related his physiological findings on the inner ear and auditory nerve to the ability to hear.

Davis also was a pioneer in the application of rapidly developing electronic amplifiers to other problems related to hearing. These include the measurement of normal and impaired hearing, the assessment of the effects of noise on hearing, the design of hearing aids, and various problems in speech.

For his work Davis was awarded the 1975 National Medal of Science. He also received the Gold Medal Award of the Acoustical Society of America; the Gold Medal Award of Merit of the American Otological Society; the Beltone Institute for Hearing Research Award; the International Prize of the Amplifon Research and Study Center at Milan, Italy; the George C. Shambaugh Prize in Otolaryngology of the Collegium Oto-Rhino-Laryngologicum Amicitae Sacrum; the Honors of the Association of the American Speech, Hearing, and Language Association; the Carhart Memorial Lectureship Award of the American Audiology Society; and the Award of Merit of the Association for Research in Otolaryngology.

In addition to being president of APS, Davis also served as president of the American Electroencephalographic Society, the Acoustical Society of America, and the Nu Sigma International Medical Fraternity. He also was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophic Society.

Davis also was awarded honorary doctorate degrees from Colby College, Northwestern University, Washington University, Syracuse University, and the University of Michigan.

Davis is survived by his wife, Nancy Vose Davis, a brother, Horace Davis, two sisters, Sarah Pope and Esther Brown, two sons, Allen Y. Davis and Rowland H. Davis, a daughter, Anna N. Hessey, four grandchildren, and four great-grandchildren.

Torsten Teorell (1905–1992)

Torsten Teorell, Uppsala, Sweden, died August 4, 1992 at the age of 87. He had a very active scientific career, leading to significant contributions to physiology.

Teorell started his medical studies at the Karolinska Institute in Stockholm and got his first scientific impulses from the biochemist Einar Hammersten. Teorell's doctoral thesis in 1933 dealt with gastric secretion and especially his concept of back- or exchange diffusion of hydrogen ions through the gastric mucosa. This work reflected his interest for biophysics that had been acquired through personal contacts with A. V. Hill and F. G. Donnan in London in the late 1920s. When he later came to the Rockefeller Institute to work with Osterhout and Michaelis, he found that the transport of cations was higher than expected from free diffusion in a solution. This acceleration was the first observation that later was explained by "fixed" charges. In 1935 he published a short communication to the proceedings of experimental biology and medicine

(only 2 pages) showing that the presence of immobilized carboxyl groups in protein-containing membranes gave rise to a Donnan effect on both sides of the membrane. Thus the total membrane potential was a sum of this new potential, the earlier known Donnan potential, and the diffusion potential within the membrane. This was the first quantitative presentation of "charged membranes." However, almost identical ideas were published shortly afterward by Meyer and Seivers, and the theory has since been called the "Teorell-Meyer-Seivers" theory. The TMS formula dealt with the electrical membrane potential, but in 1951 Teorell extended the theory to include also ion transport, electrical resistance, rectification phenomena, etc. This was a combination of Planck's diffusion theories and the fixed charge concept.

In 1953 Teorell extended his concept when he discovered oscillations of electrical potentials and water flow through a simple porous glass membrane. The membrane oscillator was thus discovered. He could now in artificial systems imitate the variations in potentials, resistances, etc., as had been demonstrated in nerves and heart. Teorell's concept offered an explanation for the complicated process of mechanoelectrical transduction.

Teorell established an important network of fellow scientists all over the world; many came to Uppsala in 1980 to celebrate his 75th birthday with a symposium in his honor.

A review of Teorell's scientific word would, however, not be complete if there was no mention of his contribution to pharmacokinetics. In 1936 he published a theoretical, mathematical study on the distribution of drugs in the body after different routes of administration. At that time his speculation was almost a negative merit, but with time it has become fully appreciated, and today Teorell is correctly regarded as the "father of pharmacokinetics."

Teorell was professor in physiology and medical biophysics at the University of Uppsala from 1940 to 1972. During these years he guided a large number of grateful pupils from many parts of the world. His scientific excellence was combined with the mind of a great humanist. He and his family opened their home for all who were privileged to work with Torsten Teorell. A great scientist, a great human being, and a beloved friend will be missed.

Karl Johan Obrink
Nigel Marsden

1994 APS Conferences and Meetings

APS Intersociety Meeting
Regulation, Integration, Adaptation: A Species Approach

APS Conference
Physiology of the Release and Activity of Cytokines

APS Conference
Mechanotransduction and the Regulation of Growth and Differentiation

The Official Travel Agent Announces

Travel Plans

to the

XXXII International Congress of Physiological Sciences

Glasgow, Scotland ◆ August 1-6, 1993

Plans are underway for complete travel arrangements to Glasgow, including:

◆ Air travel via BRITISH AIRWAYS or NORTHWEST AIRLINES, with special low fares starting at $549 from New York.

◆ Connecting domestic flights at low add-on rates.

◆ Confirmed rooms in Glasgow at these hotels:

HOTEL	DOUBLE	SINGLE
Stakis Grosvenor (downtown)	$187	$148
Forte Crest (central)	$153	$136
Kelvin Park Lorne (near Congress Center)	$153	$136

Hotel prices include breakfast, VAT and service. All prices quoted on October 1992 exchange rate and subject to change.

By including your hotel in your travel package, you will be assured of being confirmed in the hotel of your choice.

Tour plans for the congress include:

◆ Three day London stays (pre or post congress)

◆ Pre conference tour of Scotland. Enjoy a one week tour of this beautiful country, including Edinburgh, the Highlands and the Isle of Skye.

◆ Pre conference tour of England and Scotland. This exciting tour includes London, the Lake District, Edinburgh and the Highlands.

◆ Post conference cruise to Scandinavia and Russia. Enjoy a luxurious 12 night cruise departing from London for Kiel Canal, Stockholm, Helsinki, St. Petersburg (Leningrad), Visby (Sweden), Copenhagen and Oslo.

Individual arrangements can also be made on request, including hotels, tours, car rentals

Please send me the travel brochure for the XXXII International Congress of Physiological Sciences to be held in Glasgow August 1-6, 1993.

Name_____

Address_____

City_____ State_____ Zip_____

Telephone ____-____-_____ Fax ____-____-_____

Please return to:
Ambassador Chevy Chase Travel
2 Wisconsin Circle
Chevy Chase, MD 20815
or
FAX 301-907-4787

News From Senior Physiologists

Letters to Helen M. Tepperman

"I became emeritus a couple of decades back," writes **Hubert Catchpole** from Chicago, "but I always avoided actual retirement as such. I have since acquired a medley of titles including professor of histology (active!), which by a historical accident happens to be in the college of dentistry. I have functioned as a visiting professor of the humanities at Rush University.

"Robin is a pathologist and we attended the AIDS meeting in Amsterdam. We are archeology fans and are going on a trip to Jordan."

Nathaniel I. Berlin reports that he left Northwestern University five years ago, where he was director of the cancer center and Teuton Professor of Medicine, to be deputy director of the University of Miami's Sylvester Comprehensive Cancer Center.

Although Berlin did serve from 1988 to 1989 as the center's director, he said he had no desire to become a director. "I have had my time in management and wanted a staff position after I left Northwestern University," he wrote, adding that he already had sufficient management responsibilities at the National Institutes of Health in various positions including director of the Division of Cancer Biology and Diagnosis and as medical officer in the Navy assigned to the headquarters of the Armed Forces Special Weapons Project.

"I became a member of the American Physiological Society while I was at the University of California and in the Donner Laboratory. At that time and today I consider myself to be a whole animal physiologist, but I have come to recognize that we are almost a dying breed. At times in my career . . . I became concerned about curriculum and today I am concerned, but not active, in what we teach our medical students and in the too broad field of physiology which is critical to medicine and human biology and its derivative, clinical medicine. Who is going to teach and what are we going to teach? The rapid advances made by the molecular biologists have changed things dramatically.

"I expect to complete my service at the University of Miami shortly and become professor emeritus. If all goes well I will spend about a year at the National Institutes of Health and then return to Miami. I am already a professor emeritus at Northwestern University. I don't know whether this is a distinction to be an emeritus professor at two schools, but I gather it is not common."

Letter to Horace Davenport

Horace Davenport writes: "As a member of the Society's Senior Physiologists Committee, I received at the first of this year a list in alphabetical order of the names of members who were born in 1922 or earlier. I was instructed to send the Society's greetings on their 70th, 72nd, or 80th birthday to members whose names fell between Leland C. Clark and E. D. Goldsmith. In that category was Horace W. Davenport—10/20-12. Accordingly, today, my 80th birthday, I gave myself the Society's congratulations and, in return, I thanked the Society for its consideration.

"It is customary to ask those to whom birthday greetings are addressed to report what they have been up to. I replied that I had quit my chairmanship of the Department of Physiology at the University of Michigan five years before I was required to do so for the reason I could no longer give the department appropriate leadership. I stopped laboratory research a year or so later because I had run out of ideas and methods. There was a lot to be done, but I did not know how to do it.

"Since then I have devoted my full time to writing books and articles on the history of physiology or medicine. For the Socicty's archives I enclose a list of my 9 books and 27 articles. Most of the articles and some of the books have been published. The publication of my most recent book, *A History of Gastric Secretion and Digestion; Experimental Studies to 1975*, was sponsored by the Society, for which I am very grateful."

Membership Status

October 1992

Regular	4,869
Emeritus	809
Honorary	31
Corresponding	336
Associate	775
Student	441
Associate Corresponding	47
Total	7,288

Newly Elected Members

The following were elected to membership in the Society by Council at its 1992 Fall Meeting, Colorado Springs, Colorado.

Regular

Stanley W. Ashley
University of California, Los Angeles

Thomas W. Balon
University of Iowa

Kim E. Barrett
University of California, San Diego

Robert C. Basner
University of Illinois, Chicago

Christine Baylis
West Virginia University

Bruce A. Berkowitz
University of Texas Southwestern
Medical Center, Dallas

Ann M. Bode
University of North Dakota

Gerda E. Breitwieser
Johns Hopkins University

Aline S. Buist
Oregon Health Sciences University

H. Dwight Cavanagh
University of Texas Southwestern
Medical Center, Dallas

Fedias L. Christofi
Ohio State University

Robert E. Condon
Medical College of Wisconsin

John D. Conger
VA Medical Center, Denver

Sheila E. Crowe
McMaster University

Jesus H. Dominguez
Indiana University

Matthew J. During
Yale University

Thomas J. Eddinger
Marquette University

Jack A. Elias
Yale University

Bernard M. Evers
University of Texas, Galveston

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Karen Woolcock
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Jeffrey D. Yingling
University of Kentucky

Charles F. Zwemer
Indiana University

Introducing . . .

Alice W. Hellerstein

The APS is pleased to announce that Alice W. Hellerstein has been hired to replace Bill Samuels as the Society's Public Affairs Officer. Having spent the last five years in the FASEB Office of Public Affairs, Alice is well versed in strategies for achieving the legislative, media, and public policy agendas of scientific societies. She has been instrumental in the development of the Consensus Conferences organized annually by FASEB to recommend an appropriation level for NIH and ADAMHA and has been responsible for the publication of a monthly Summary of Legislation covering actions affecting the biomedical research community.

Prior to serving as the FASEB Manager for Legislation/Policy Development, Hellerstein served as Foreign Service Information Officer, US Information Agency, and as Washington Correspondent for The News World. Alice received her BS degree from Georgetown University School of Foreign Service and her MA degree from the International Relations Institute of Cameroon.

Alice will be working closely with the Animal Care & Experimentation Committee and the Public Affairs Advisory Committee to develop the Society's positions on issues affecting the membership. She will also be working to develop an electronic network and bulletin board to keep the membership informed of evolving issues.

Welcome aboard Alice! She can be reached in the APS Offices by telephone (301) 530-7105 or by e-mail: alice@APS.MHS.Compuserve.com.

Call for Nominations

Editor

American Journal of Physiology: Lung Cellular and Molecular Physiology

Nominations are invited for the editorship of the *AJP: Lung Cellular and Molecular Physiology* to succeed Donald J. Massaro, who will terminate his responsibilities as Editor in 1993. The Publications Committee plans to interview candidates in March–April 1993 so that the new Editor can assume his/her duties on January 1, 1994 or before. All materials must be received on or before January 15, 1993 to be considered. Nominations, accompanied by a curriculum vitae, should be sent to Brenda B. Rauner, Publications Manager and Executive Editor, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991.

103rd Congress Interests for APS Limited to Appropriations, NIH Authorizations

Despite campaign oratory that the Administration will move fast with programs to stimulate the nation from the doldrums, don't look for any speed records.

Based on history, it will be March, perhaps April, before the 103rd Congress will have itself organized. And with approximately 25% of the Congress being made up of new members, it could be even longer before it gets down to business.

Unlike the Congresses of the last 10 years, the early agenda of this Congress has limited interests for the American Physiological Society. This time the Society's primary interests are narrowed, by and large, to a variety of appropriation bills and legislation reauthorizing programs of the National Institutes of Health (NIH).

For the first time in a decade there are no significant bills pending concerning the use of live animals for teaching or research. The one major piece of animal legislation—research facilities protection—was passed by the last Congress and was signed into law in August by President George Bush.

The major question, indeed, is how the 103rd Congress will view expenditures for Fiscal Year 1994. Unlike the parameters set by the 102nd Congress, there are no budget agreement walls that prohibited the movement of funds between the budget allocations for domestic, defense, and foreign spending.

Acting in the closing hours of the 102nd Congress, Senate-House conference committees approved spending outlays for Fiscal Year 1993. In most cases, the conference committees did provide for token increases, but the increases for the most part were less than the rate of inflation and in some cases were less than the President's budget requests.

The Fiscal Year 1993 appropriation for the now combined NIH and the research components of the Alcohol, Drug Abuse, Mental Health Administration (since renamed Substance Abuse and Mental Health Services Administration; SAMSHA) is $10,362 billion, an increase of 2.9% ($291 million).

Faring somewhat better was the National Science Foundation with an appropriation for Fiscal Year 1993 of $2,733 billion, an increase of 6% ($162 million).

Other Fiscal Year 1993 appropriations of interest to APS are

- Department of Veterans Affairs (research), $232 million, an increase of 2% ($5 million);
- NASA Division of Life Sciences, $132.7 million, a 10% reduction ($14.9 million);
- Department of Agriculture (animal services), $9.5 million, no change from Fiscal Year 1992.

While it will be summertime before the Congress begins to give serious consideration to appropriations for Fiscal Year 1994, there is one bill that has been promised a fast track: the legislation reauthorizing NIH programs. The bill was pulled from the Senate floor just before the Congressional adjournment in October.

The bill, which has been debated for almost two years, was pulled when its sponsors could not reach a compromise with those who oppose the provision that would allow for federal funding for fetal tissue transplantation research.

Senate majority leader George Mitchell (D-ME) said he plans to make the NIH reauthorization bill S.1 for the 103rd Congress and bring it to the Senate floor as soon as possible.

W. M. Samuels

PHS Makes Revisions To ALERT List Procedures

The US Public Health Service has changed its procedures for managing the ALERT List, a database listing individuals who are under investigation by the agency for alleged scientific misconduct.

Under revised rules, names will be entered on the ALERT List only when an institution submits a report finding an individual guilty of scientific misconduct or when the agency's investigation finds an individual guilty of scientific misconduct. Previously, the name of an individual was added to the ALERT List when an investigation was first initiated and before any proof of the allegations had been established.

The American Physiological Society, along with others in the scientific community, had voiced its disapproval of placing names on the ALERT List before proof of scientific misconduct had been established.

Greenpeace Hurting in Norway

A Norwegian newspaper, Dagblader, has reported that Greenpeace International may end its operations in Norway, as its membership is said to have dropped from 15,000 to 35.

Greenpeace's Norwegian membership has plummeted since 1989 when a film, "Survival In The High North," by Icelandic film-maker Magnus Gudmundsson documented how Greenpeace staged animal mutilations for its fund-raising films. Greenpeace lost its libel suit against Gudmundsson in March.

Court Actions Affect Grants and Open Meetings

A Washington state court has ruled that portions of unfunded grants must be made available to the public on request, and the Vermont Supreme Court has ruled that institutional animal care and use committee meetings are subject to the state's open meetings laws.

Washington—The University of Washington is appealing a state court decision that the university must release portions of an unfunded grant proposal sought by the Progressive Animal Welfare Society. In its appeal of the August decision, the university said:

"The university's position is that unfunded grant proposals are exempt from release under First Amendment protection of academic freedom, other applicable federal laws and regulations, and under Washington state public disclosure law on the basis of exemptions for rights of privacy, the preliminary nature of the document, and the valuable nature of the research formula, design, and data.

"This suit has broader implications than anti-vivisection concerns. The University of Washington, in common with other universities, respects and protects the confidentiality of unfunded, preliminary proposals in all fields. Confidentiality in the early phases is crucial for protecting the intellectual property interests of individual researchers and universities or research sponsors, allowing them the opportunity to benefit from their creative insights and efforts."

Vermont—The Vermont Supreme Court has declared that the University of Vermont's Institutional Animal Care and Use Committee (IACUC) is subject to the state's Open Meeting Law and Public Records Act, rejecting arguments that the IACUC is not a public body because it is not a committee of the university and that an IACUC is an administrative body and not a policy making body.

U.S. Not Likely To Follow Britain On Research Limits

It is unlikely that the United States will follow Britain's new restrictions limiting the ability of older scientists to conduct research involving live animals.

The new British rule shortens the length of a project license held by a researcher over the age of 65 and effectively prevents anyone older than 70 from holding a project license. Licenses, which allow researchers to work with live animals and are reviewed every five years, will be reviewed annually for any researcher over 70 years old.

In the United States, the law prevents discrimination on the basis of age in hiring, firing, and assigning duties with the exception of work that affects public safety, such as fire fighting. Because animal research has no such impact, the British rule probably would be declared illegal in this country, according to legal experts.

The new rules are the result of animal rights activists filming and publicizing in the national media the work of an 89-year-old scientist at the Medical Research Council's National Institute for Medical Research. An inquiry showed that the scientist had breached the Animals Scientific Procedures Act of 1986.

French Uphold Animal Use; Seven Activists Sentenced

The French Supreme Court of Appeals has affirmed the right to conduct research on animals.

The Court ruled that CNRS neurophysiology laboratory near Paris "is a public research organization at the center of scientific and medical discoveries that benefit man," rejecting the animal activists' argument that the thefts were justified because the animals were illegally obtained and mistreated for useless research.

The case stemmed from a 1985 raid on the laboratory where 17 baboons were stolen by animal activists, of which 7 were later arrested. They were given suspended prison sentences of up to six months in their initial trial.

The activists sought to have the theft of laboratory animals recognized under a new legal category distinct from other theft, maintained that laboratory animals are not material objects, that wild animals cannot be possessed, and that CNRS had never demanded the return of the baboons.

Molecular Mechanisms of Alcohol: Neurobiology and Metabolism

G. Sun, P. Rudeen, W. Wood, Y. Wei, and A. Sun (Editors)
Clifton, NJ: Humana, 1989, 408 pp., illus., index, $74.50

Despite its clear importance and bona fide acceptance as a disease, alcoholism is very poorly understood. The acute actions of ethanol, partly because of the high concentrations of the drug necessary to produce behavioral actions (legal intoxication is defined as a blood concentration in the 20 mM range), have often been assumed to be nonspecific. A prevailing view has been that ethanol as well as general anesthetics produce their actions by a perturbation of the lipid matrix of the membrane, secondarily affecting membrane proteins. Recently this view has been questioned, and it has been suggested that the actions of this class of drug may be more specific than previously thought and that direct interactions with membrane proteins may occur. In this volume, data describing both the generalized perturbation of membrane lipids and the more specific alteration of distinctive proteins by ethanol are represented. In addition to elucidating the mechanisms of acute drug action, researchers in the alcohol field are interested in determining the mechanisms of long-term adaptation to chronic alcohol exposure. This book is a report of the proceedings of a meeting that took place in Taiwan in 1988, and it attempts to cover work in both the acute and chronic arenas.

The book covers a wide range of topics and approaches. Its 27 chapters are distributed among four topic areas: 1) ethanol action on neurochemical mechanisms, 2) ethanol and cell culture, 3) ethanol effects on metabolism, and 4) animal models for alcohol research. The chapters range from overviews, such as one describing methodologies involved in working with cell culture systems and general results derived from these preparations, to very specific topics, such as the presentation and interpretation of biophysical experiments designed to elucidate ethanol's actions on lateral and vertical membrane lipid domains. Data are presented describing the actions of ethanol on a number of neurotransmitter systems, and it is suggested that particular transmitters, such as serotonin, may play a role in the development of alcohol preference. In addition to attempts to explain the acute actions of ethanol, coverage is also given to the chronic effects of the drug, touching on topics such as the role of vasopressin in the development of alcohol tolerance and the mechanisms of alcohol-related birth defects of the central nervous system. The study of animal lines selectively bred for particular attributes with respect to alcohol consumption and response is also included.

In summary, this volume covers a wide spectrum of current research on the actions of ethanol on membrane lipids and metabolism. The papers are generally well written, and a reader will be relatively up-to-date on these topics after reading this volume. The book, however, pays relatively scant attention to some of the newer inroads into the molecular basis of alcohol action. Many physiologists will be surprised to find that this volume, which has neurobiology as one-half of its subtitle, contains almost no electrophysiology. The only voltage-clamp tracings to be found are obtained from cardiac tissue. A revolution of sorts is occurring in the alcohol field, and much of the newer data has appeared only after the conclusion of this symposium. For example, electrophysiological techniques, including voltage clamping, have identified probable ethanol targets within the nervous system, such as the NMDA receptor, the GABA receptor, and voltage-gated calcium channels, and have begun to explain some aspects of ethanol's actions on these targets. In addition, the techniques of molecular biology have been coupled with electrophysiology to relate the amino acid sequence of some of these targets with the actions of the drug. The exclusion of these studies probably results from the fast-breaking excitement of the alcohol field rather than an oversight on the part of the editors, since this new wave of research as appeared after the symposium. However, readers wishing to know what is happening at the forefront of alcohol research should be aware of this omission.

Steven N. Treistman
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Contemporary Ergonomics 1990

E.J. Lovesey (Editor)
New York: Taylor and Francis, 1990, 511 pp., illus, index, $77.00

This volume contains the proceedings of the Ergonomics Society's 1990 Annual Conference held at Leeds, England. There are over 80 presentations consisting of data-based reports and invited reviews that are classified into 18 sections that reflect the diversity of contemporary ergonomics. Topics covered include design and evaluation of computer systems, man-machine interface, communications, expert systems, alarms, and cognitive function. There are also sections devoted to military ergonomics, ergonomics for the elderly, sports ergonomics, and biomechanics and manual handling. In general, the articles are well written and the figures and graphs are clear.

There are three sections of the book that have relevance to applied physiology. A section entitled "Musculoskeletal Disorders" presents articles on the current status of occupational "physiotherapy" in the United Kingdom, followed by a series of reports on the monitoring and case control of the Carpal Tunnel Syndrome. This section includes an interesting report on sickness absence and morbidity rates resulting from musculoskeletal disorders of the shoulders and upper limbs across various occupational classes in England and Wales. Several articles in the section on "Biomechanics and Manual Handling" focus on muscle fatigue with repetitive loads and the physiological effects of various work-rest intervals. Consideration is also given to muscle-strengthening programs for improving materials handling in industry. A third section entitled "Seating Posture and the Spine" contains several reports specific to the lower back and seating in the work place. Other sections having physiological relevance (e.g., sport ergonomics and ergonomics for the elderly) are not particularly well developed. In summary, of the 80–85 articles contained in this volume, 10–15 focus on medical or physiological issues.

Much of the rest of the volume is devoted to research on equipment design modifications and computer interface as they relate to human performance, both of which are longstanding aspects of contemporary ergonomics. The use of human information processing models in applied settings, developing standards for room design, modifications to enhance crew communications in military settings, and the use of video systems to conduct task analysis are just a few examples of the research in this area.

The value of this book is as a reference for researchers interest-

ed in the breadth of investigations being conducted under the broad heading of ergonomics. A quote on the cover page of this volume ("ergonomics-setting standards for the 90's") alludes to the important role the field of ergonomics will have in the next decade as human rights and occupational disability issues continue to challenge industrialized societies. This volume of proceedings provides an overview of the multifaceted nature of contemporary ergonomics, and it accents the point that resolution of many of the more critical issues in work settings will probably require a multidisciplinary approach.

Mark S. Sothmann
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Circulatory Physiology—The Essentials

James J. Smith and John P. Kampine
Baltimore, MD: Williams & Wilkins, 1990, third ed., 345 pp., illus., index, $23.95

This book covers the basic principles of cardiovascular physiology commonly taught to first-year medical students. Mainly organ and systems level processes are presented with the aid of illustrations obtained from a variety of primary sources. Descriptive writing with limited recourse to mathematical expressions is used. Contents include general features of blood and the circulation; hemodynamics; structure and function of the heart; electrical and contractile properties of the heart; pressure and flow in the arterial and venous systems; venous return and cardiac output; the microcirculation and lymphatic systems; the peripheral circulation and its regulation; regulation of arterial blood pressure; and circulation to special regions. Clinical relevance is discussed, and the pathophysiology of ischemic heart disease, congestive heart failure, hypertension, and circulatory shock are covered in two chapters. Also included are two chapters dealing with the physiology of exercise, various types of non-exercise stress, and the effects of aging.

Although the authors claim that significant updating of material has occurred in this third edition, instances in which important current concepts have not been included can be cited. For example, numerous studies over the past decade have indicated that myocardial contractile state changes with myocardial fiber length and that a close correlation exists between myocardial oxygen consumption and the ventricular pressure-volume loop area. These two findings have led to improvements in the understanding of cardiac mechanics and energetics in ways that are not reflected in the present text.

The book appears as an attractively designed paperback edition with liberal use of subject headings and easy-to-comprehend figures. The absence of study questions or learning objectives could be a detractor for some students. Because of its concise and yet comprehensive coverage of essential concepts of applied cardiovascular physiology, this book may be particularly useful to medical students and house officers preparing for board examinations. As indicated by the authors in the preface to the first edition, the book does not stress unsolved problems, and it is not recommended for those interested in a rigorous or critical treatment of the subject.

Douglas M. Griggs, Jr.
University of Missouri, Columbia

Free The Animals! The Untold Story of the U.S. Animal Liberation Front and Its Founder, "Valerie"

Ingrid Newkirk
Chicago, IL: Noble Press, 1992, 371 pp., illus., $13.95

Ingrid Newkirk, the national director of People for the Ethical Treatment of Animals (PETA), had an opportunity to give a glimpse into the secretive work of the Animal Liberation Front (ALF). But she blew it.

ALF and PETA have been linked for a decade, and Newkirk would be the most logical person to tell a believable story about ALF, an underground organization whose tactics have moved from simple breaking-and-entering to "rescue laboratory animals" to its present-day status as a domestic terrorist group. Newkirk's credentials for being the best person to tell the story rests on the fact that she serves as ALF's spokesperson.

Newkirk states flat out at the beginning of her book that "[E]very raid and the events leading up to it are accurately described . . ." while protecting ALF members by fictionalizing their ages, physical descriptions, and careers as a means to protect them from prosecution.

Where Newkirk blows it is that many of those who will want to read her book will find that events leading up to raids are not accurately described. For example, in the telling of the two raids on the National Naval Medical Center at Bethesda, MD, Newkirk goes into fantasied detail on each of the four trips the ALF raiders made into and out of the installation:

"Then she drove up Rockville Pike and through the main gates into the huge Navy compound. The enthusiastic young guard in the immaculately starched uniform had seen there were no military stickers on the car. With his white-gloved hand, he motioned Valerie to stop." Similar scenes are repeated as to how the raiders entered and left the Navy facility.

The National Naval Medical Center is an open base and, therefore, does not have guards posted at its entrances, nor is there any vehicle check or need for military stickers on vehicles entering the compound. Moreover, virtually anyone who lives in the Washington, DC area, and Newkirk does, knows that the major military installations in and around the nation's capital are (and have been for some time) open bases.

Because of such obvious mistruths along with other misstatements (the relocating of the Chesapeake Bay by placing it between Baltimore and Washington cannot be founded as literary license), there is reason to doubt the accuracy and believeability of the rest of the story beyond the fact that the raids mentioned are known to have taken place.

It is disappointing that the opportunity to tell the story of an organization that has become nearly a household name was wasted by the embellishment of mistruths and misstatements where such embellishments were not in the least bit needed to protect the guilty. If Newkirk cannot be honest in her reporting of the insignificant, then her reporting of future actions by ALF may also be suspect.

W. M. Samuels

Drug & Alcohol Abuse Reviews 1991 Liver Pathology and Alcohol

Ron R. Watson (Editor)
Totowa, NJ: Humana, $89.50

This 620-page book is the second volume on alcohol and the liver. It comprises 23 chapters, each dealing with a specialized topic. The first chapter by Barry J. Potter on "Alcohol and Hepatic Iron Homeostasis" is a very comprehensive and extremely well-documented review. It is highly recommended as a thorough analysis of the field. The second review by F. Joseph Roll on the "The Pathogenesis of Inflammation in Alcoholic Liver Disease" deals with the still-unresolved question of whether the inflammatory response is a consequence or a cause of alcoholic liver injury. Relevant contributions, mainly of the author's laboratory, are discussed in detail. The chapter by Hagal Rottenberg on "Liver Cell Membrane Adaptation to Chronic Alcohol Consumption" describes some aspects of these changes and emphasizes similarities between liver membranes and those of other tissues. Edward Reyes discusses "The Effects of Prenatal Alcohol Exposure on Gamma-Glutamyl Transpeptidase" and also covers the more general topic of gamma-glutamyl transpeptidase and its usefulness in diagnosis. Lester A. Reinke and Paul B. McCay address in a very balanced way the hotly debated issues of "Free Radicals and Alcohol Liver Injury."

Mack C. Mitchell et al. review in depth, and with abundant documentation, the key role of GSH in various defense mechanisms against toxic liver injury promoted by alcohol. The chapter by Siraj I. Mufti on "Liver Cancer: Role of Alcohol and Other Factors" provides a concise summary of some of the ethanol-cancer interactions. In "Alcohol and Hepatic Protein Modification," Renee C. Lin and Lawrence Lumeng emphasize the importance of acetaldehyde-protein abducts and the corresponding antibodies. Puran S. Bora and Louis G. Lange, in "Fatty Acid Ethyl Esters, Alcohol, and Liver Changes," propose the interesting hypothesis that the formation of fatty acid ethyl esters in extrahepatic tissues may be the cause of damage at those sites where alcohol is not fully metabolized by oxidative pathways. The chapter by M. R. Lakshman et al. on "Ethanol, Lipoprotein, Metabolism, and Fatty Liver" covers an extremely vast body of information since alterations of lipid metabolism are early manifestations of alcohol abuse, can readily be reproduced in experimental animals, and are also reflected in alterations of circulating lipoproteins.

Lakshman et al. provide us also with considerable insight in possible avenues for future research. Edward T. Knych reviews the "Effect of Ethanol on Splanchnic Blood Flow" with an unusually detailed bibliography. Rolf F. Kletzein, in his article on "Interaction of Ethanol and the Glucocorticoids: Effects of Hepatic Gene Expression," provides a synopsis of this somewhat narrow topic. The chapter by Billy W. Geer et al. on "Genetric and Dietary Control of Alcohol Degradation in Drosophila: Role in Cell Damage" ranges from studies in insects to sophisticated membrane cell damage in vertebrates, thereby overlapping with several other chapters in the book. In his chapter on "Human Liver Alcohol Dehydrogenase Gene Expression: Retinoic Acid Homeostasis and Fetal Alcohol Syndrome," Gregg Duester provides an in-depth summary of up-to-date knowledge concerning the molecular biology of the enzyme. He also describes an attractive hypothesis (although as yet not compelling) linking the enzyme to retinoic acid homeostasis and the development of the fetal alcohol syndrome. In William E. Sonntag's "Influence of Ethanol on Functional and Biochemical Characteristics of Skeletal Muscle," the reader will find a good review of normal muscle contraction and their alterations by alcohol.

In the chapter by Thomas M. Sorranno and Lester G. Sultatos on "Alcohol and Liver Damage: Xanthine Oxidase," several mechanisms, reviewed in other chapters, are again addressed here, such as lipid peroxidation and free radicals, with special emphasis on the possible role played by xanthine oxidase. Akira Yoshida and Akitaka Shibuya's chapter on "Polymorphisms of Alcohol and Aldehyde Dehydrogenase and Their Significance for Alcohol Liver Disease" reviews some of the basic issues related to isozymes of ADH and ALDH in a very clear and complete way. The chapter by Olalekan E. Odeleye and Ronald R. Watson on "Effects of Alcohol and Cocaine Abuse on the Antioxidant Systems, Nutritional Status, and Liver Damage" touches on a number of subjects also covered in other chapters but, in addition, deals with lesions related to cocaine abuse. The chapter by Charles P. Denaro and Neal L. Benowitz on "Caffeine Metabolism: Disposition in Liver Disease and Hepatic-Function Testing" describes how caffeine is handled by the diseased liver and how it could be used as a liver function test. In "Marijuana, Liver Enzymes, and Toxicity," Lester M. Bornheim summarizes interactions of marijuana constituents with other drugs and the possibility of adverse effects. Robert S. McCuskey's chapter on "In Vivo Microscopy of the Effects of Ethanol on the Liver" gives an account of the methodology and the results obtained in his pioneering studies on the role of Kupffer cells in the microvascular response to ethanol. David H. Van Theil and Ralph E. Tarter, in "Interrelationships Between the Brain and the Liver," provide an overview of brain-liver interactions in individuals with alcoholic and nonalcoholic liver disease, especially before and after transplantation. Louis Shuster's chapter on "Morphine and Liver Damage" deals with the experimentally still unresolved question of the interaction of morphine, and morphine derivatives, with ethanol.

In summary, this book should not be viewed as a comprehensive treatise of alcohol-induced liver damage but rather as a collection of a series of independent in-depth reviews of certain selected topics, useful to the specialists in the corresponding field.

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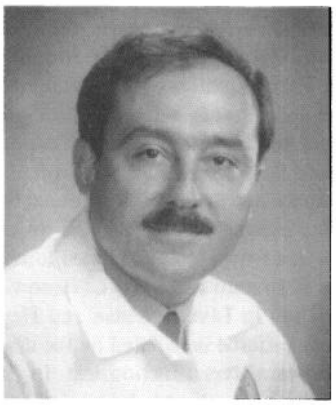
Director, Alcohol Research & Treatment Center
Bronx VA Medical Center

Tulane Professor Receives National Achievers Award



A Tulane University Medical Center physiology professor has received a national TRIO Achievers Award, which goes to individuals who are recognized for their success following participation in various federally funded programs, such as Upward Bound.

Richard Vari, who grew up in the eastern Kentucky coal mining town of Cumberland, was selected in 1969 while in high school for Upward Bound, which afforded him the opportunity to attend Southeastern Community College at Cumberland.

A year later he transferred to the University of Kentucky, where he earned a baccalaureate degree in biology. As a work-study student in a physiology laboratory, Vari discovered an interest in renal physiology. He then earned both a Master's degree and a doctorate degree in physiology at the university and in 1983 was named a postdoctoral fellow in physiology at the University of Missouri.

Vari has been at Tulane's medical school since 1986, where his research focuses on the renal pathophysiology of hypertension, diabetes, and ureteral obstruction. He has been a member of APS since 1987.

Formerly at the National Naval Medical Center, **Pamela J. Gunter-Smith** has accepted a position in the Biology Department at Spelman College. A member since 1983, Gunter-Smith has been actively involved in the Society's minority programs and a member of the Porter Physiology Development Committee.

Paul M. Vanhoutte of Baylor College of Medicine has been appointed Vice President of Research, Institute de Recherche International Servier, Courbevoie, France.

Corresponding member **Eric N. G. Fellenius** has relocated to the Research and Development Department, Swedish Environmental Protection Agency, Solna, Sweden.

Formerly at Emory University, **J. Jay Gargus** has accepted a position in the Department of Physiology and Biophysics, University of California, Irvine. Gargus, a member since 1986, is a member of the Society's Long-Range Planning Committee.

Wing-Tai S. Cheng, Dartmouth Medical School, has accepted a position at the Aetna Life and Casualty, Technology Assessments Policy, Hartford, CT.

Terrence E. Sweeney, who has been at the University of Arizona, is now in the Department of Biology, University of Scranton, Pennsylvania.

Formerly at the Nova Pharmaceutical Corporation, Baltimore, **Robert C. Hanson** has joined 3M Pharmaceuticals, St. Paul, MN. Hanson was elected to membership in 1980.

Henry G. Friesen has been appointed Head, Department of Physiology, University of Manitoba, Winnipeg. A member since 1966, Friesen was formerly President, Medical Research Council of Canada, Ottawa.

Douglas S. Lewis has moved to Iowa State University, Ames from the Southwest Foundation for Biomedical Research, San Antonio. Lewis has been an APS member since 1988.

Formerly at the University of North Carolina, Chapel Hill, **Mitchell Friedman** has accepted a position as professor and chief, Pulmonary Disease/Critical Care Medicine Section, Tulane University Medical Center.

Formerly at Tulane University, **Paul E. Gottschall** is now at the University of South Florida College of Medicine, Tampa.

Warren Tse, University of Health Sciences, Chicago, is now in the Department of Physiology, Chinese University of Hong Kong.

John Fox has left Tulane University Medical Center and is now with NPS Pharmaceuticals, Inc., Salt Lake City, Utah.

Formerly at the University of Iowa, **David H. Warden** has accepted a position at the University of Minnesota, Minneapolis.

Dennis N. Marple of Auburn University is now in the Animal Science Department, Iowa State University, Ames.

J. Michael Overton of the University of Louisville has accepted a position at Florida State University, Tallahassee.

E Bar-Yishay is now in the Department of Pulmonary Medicine, Children's Hospital, Columbus, Ohio. Formerly at the Hadassah University Hospitals in Jerusalem, Israel, Bar-Yishay was elected to corresponding membership in 1989.

Michael J. Kenney, formerly in the Department of Biology at Rhodes College, has moved to Kansas State University, College of Veterinary Medicine, Manhattan.

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 *three months* (by the 5th of the month) before the desired publication date. Send all information to Martin Frank, Editor, *The Physiologist*, APS, 9650 Rockville Pike, Bethesda, MD 20814.

APS Member Elected to NAS

APS member **Yuan-Cheng B. Fung** has been elected to membership in the National Academy of Sciences. Fung is professor emeritus of bioengineering and applied mechanics at the University of California, San Diego. Among his early contributions were the development of theories of dynamics and stability of elastic structures in fluid stream. Fung's current work is centered around two related areas. The first is the relationship between physical stress and tissue remodeling. The second is pulmonary circulation, including the effect of hypoxic hypertension and diabetes on arterial wall remodeling, the morphometry of the vasculature and the collagen and elastin fibers, and use of the data to determine the mechanical properties of the tissues.

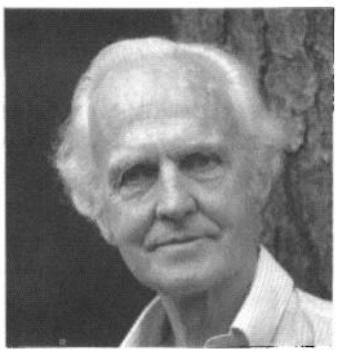
Fung's honors and awards include the Eugene Landis Award of the Microcirculatory Society; membership in the National Academy of Engineering; the Poiseulle Medal of the International Society of Biorheology; and senior membership in the Institute of Medicine of the National Academy of Science.

Knut Schmidt-Nielsen Receives International Prize for Biology

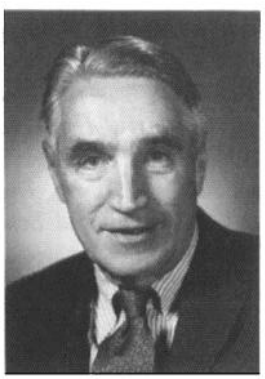
Knut Schmidt-Nielsen, Duke University, has been awarded Japan's International Prize for Biology. The prize was established in honor of the late Emperor Hirohito to recognize areas of research the Nobel Prize in Medicine or Physiology might not cover.

This year's prize carries an $80,000 check and a trip to Japan for a formal ceremony before the country's highest officials. The award recognizes Schmidt-Nielsen for his lifetime of pioneering work on how animals adapt to their environments.

Schmidt-Nielsen's experimental subjects have ranged from kangaroo rats to camels to seagulls. He has been a pioneer in the area of "scaling," the study of how body size affects an animal's life. He was also among the first to document the features of the avian respiratory system that allows birds to extract oxygen efficiently at low atmospheric pressures, an obvious benefit for flying creatures.



Earl Wood Continues Work on Acceleration



Earl H. Wood, past president of APS, will be spending the next 12 months in Toronto working on the Canadian Human Centrifuge. He will work with personnel at Defence and Civil Institute of Environmental Medicine to measure physiological responses to high sustained headward acceleration by re-establishing objective biomedical monitoring techniques and developing standardized experimental protocols on the human centrifuge.

Future Meetings

1993	
Experimental Biology '93	March 28–April 1, New Orleans, LA
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, Atlanat, GA

Biology. Animal Physiologist. Assistant professor, tenure track position beginning in August 1993, to teach animal physiology, introductory zoology course, and advanced courses in area of specialty. Required: PhD in hand by June 1993. Preferred: evidence of promise to be an excellent teacher, to be successful at grant writing, and to be able to do collaborative research with undergraduates; postdoctoral experience. Women and minority candidates encouraged to apply. Applications will begin to be reviewed December 15. Send letter of application, resume, letters from three references, and transcripts to George C. Boone, Head, Dept. of Biology, Susquehanna University, Selinsgrove, PA 17870-1001. [EOAAE]

Experimental Biologist. Miami Children's Hospital is seeking an experimental biologist interested in cardiopulmonary physiology and cell replacement for a Pediatric Critical Care Division situated in the largest children's hospital south of Washington, DC. SUNY affiliated—very attractive practice offer. Please contact Jack Wolfsdorf at Miami Children's Hospital, 6125 SW 31st Street, Miami, FL 33155. Tel: (305) 662-2639.

Assistant Professor, Physiology. Tenure-track position, beginning fall 1993. Expected to establish a vigorous, extramurally funded research program. Special consideration given to broadly trained applicants who use modern approaches to study physiological processes at integrative or organismal levels. Teaching includes participation in core undergraduate physiology and graduate specialty courses. Generous research set-up funds available. To apply, send vitae, reprints, description of research plans, and three letters of recommendation by January 15, 1993, to Charles Drewes, Physiology Search Committee, Dept. of Zoology and Genetics, Iowa State University, Ames, IA 50011.

BOOKS RECEIVED

Circumventricular Organs and Brain Fluid Environment: Molecular and Functional Aspects. A. Ermisch, R. Landgraf, and H. J. Ruhle (Editors). *Progress in Brain Research,* Volume 91. New York: Elsevier Science, 1992, 486 pp., illus., index, $248.50.

Neurobiology of Motor Programme Selection. Jenny Kien, Catherine R. McCrohan, and William Winlow (Editors). *Pergamon Studies in Neuroscience,* No. 4. William Winlow (Series Editor). Oxford, England: Pergamon, 1992, 290 pp., illus., index, $140.00.

Radioactive and Stable Isotope Tracers in Biomedicine: Principles and Practice of Kinetic Analysis. Robert R. Wolfe. New York: Wiley, 1992, 471 pp., illus., index, $89.95.

Anxiety: Recent Developments in Cognitive, Psychophysiological, and Health Research. Donald G. Forgays, Tytus Sosnowski, and Kazimierz Wrzesniewski (Editors). Washington, DC: Taylor & Francis, 1992, 282 pp., illus., index, $55.00.

Personality, Elevated Blood Pressure, and Essential Hypertension. Ernest H. Johnson, W. Doyle Gentry, and Stevo Julius (Editors). *The Series in Health Psychology and Behavioral Medicine.* Charles D. Spielberger (Editor-in-Chief). Washington, DC: Taylor & Francis, 1992, 344 pp., illus., index, $49.50.

The Initial Processing of Pain and Its Descending Control: Spinal and Trigeminal Systems. Alan R. Light, Randall C. Shults, and Sharon L. Jones. *Pain and Headache,* Vol. 12. Philip L. Gildenberg (Series Editor). New York: Karger, 1992, 306 pp., illus., index, $280.00.

Obesity. Per Björntorp and Bernard N. Brodoff. Hagerstown, MD: Lippincott, 1992, 805 pp., illus., index, $69.50.

Sleep, Arousal, and Performance. Robert J. Broughton, and Robert D. Ogilvie (Editors). Boston, MA: Birkhäuser, 1992, 286 pp., illus., index, $128.00.

Integration of Medical and Sports Sciences. Y. Sato, J. Poortmans, I. Hashimoto, and Y. Oshida (Editors). *Medicine and Sports Science,* Volume 37. M. Hebbelinck, and R. J. Shephard (Series Editors). Basel, Switzerland: Karger, 1992, 446 pp., illus., index, $318.50. (Proc. 8th Int. Biochemistry of Exercise Conference, Nagoya, 1991.)

Positions Available

There is a $25 charge per issue for each position listed. A check or money order payable to the Ameri-can Physiological Society must accompany the order. 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, 2 months preceding the month of issue (e.g., before Feb-ruary 15th for the April issue). Mail copy to APS, 9650 Rockville Pike, Bethesda, MD 20814.

Scientific Meetings and Congresses

Molecular Basis of Ion Channels and Receptors Involved in Nerve Excitation, Synaptic Transmission and Muscle Contraction, Tokyo, Japan, January 12–15, 1993. *Information:* Conference Department, New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021. Tel: 212-838-0230; Fax: 212-888-2894.

Eigth International Hypoxia Symposium: High Altitude Physiology and Medicine, Alberta, Canada, February 9–13, 1993. *Information:* Ingrid Ellis, McMaster University, 1200 Main Street West, Hamilton, Ontario, Canada L8N 3Z5. Tel: 416-525-9140, ext. 2182.

Animals in Space, University of Bordeaux 2, France, March 15–17, 1993. *Information:* Association Aeronautique et Astronautique de France, Mr. J. P. Sanfourche, 6, rue Galilee–75016–Paris. Tel: (33) 1 47 23 07 49; Fax: (33) 1 47 23 07 48.

Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, FL, May 2–7, 1993. *Information:* ARVO Central Office, 9650 Rockville Pike, Suite 1502, Bethesda, MD 20814. Tel: 301-571-1844; Fax: 301-571-8311.

28th Annual Meeting and Exposition of the Association for the Advancement of Medical Instrumentation, Boston, MA, May 8–12, 1993. *Information:* AAMI Education Department, 3330 Washington Blvd., Suite 400, Arlington, VA 22201-4598. Fax: 703-276-0793.

Thomas L. Petty Aspen Lung Conference, 36th Annual Meeting on Acute Lung Injury, Aspen, CO, June 2–5, 1993. *Information:* G. Scott Worthen, Box X272, University of Colorado Health Sciences Center, 4200 E. 9th Avenue, Denver, CO 80262. Tel: 303-270-7767; Fax: 303-270-5632.

75th Annual Meeting of The Endocrine Society, Las Vegas, NV, June 9–12, 1993. *Information:* Ann Singer, Meetings Manager, The Endocrine Society, 9650 Rockville Pike, Bethesda, MD 20814. Tel: 301-571-1800; Fax: 301-571-1869.

XIIth International Congress of Nephrology, Jerusalem, Israel, June 13–18, 1993. *Information:* Secretariat, XIIth International Congress of Nephrology, PO Box 50006, Tel Aviv 61500, Israel. Tel: 972 3 5174571; Fax: 972 3 655674.

Hungarian Physiological Fund Established

Because of the recent difficult economic situation in Hungary, the Hungarian Physiological Fund has been established to ensure that the scientific programs be maintained at international standards.

The Fund supports investigators in physiological sciences in Hungary, raises national research standards, and promotes scientific relations with other countries. The Fund also wishes to maintain an efficient Hungarian Physiological Society and to help support individuals, societies, and organizations involved in domestic and international academic and laboratory research and teaching. Funds will be used to promote theoretical and practical scientific activity, to provide for further education, and to develop international scientific relations for individuals in a private and official capacity at home and abroad. These objectives will be achieved primarily by the sponsorship of competitions and by awards.

Hungarian and foreign individuals, institutions, corporations, and societies possessing the financial means or having appropriate contacts who are sympathetic to the plight of Hungarian physiologists may support the Hungarian Physiological Fund. Send donations to the Secretariat of the Hungarian Physiological Society, POB 370, H-1445 Budapest, Hungary. Donations to the fund are tax deductible.

New LSRO Report

The Life Sciences Research Office of the Federation of American Societies for Experimental Biology has completed a comprehensive scientific report on Safety of Amino Acids Used as Dietary Supplements. The LSRO prepared the report at the request of the Center for Food Safety and Applied Nutrition of the Food and Drug Administration.

The report reviews studies on administration of 23 amino acids to animals and humans and provides an Expert Panel's appraisal of the adequacy of that information for evaluation of the safety of amino acids taken as dietary supplements.

Interested persons may order the report from the FASEB Special Publications Office, Room L-2310, 9650 Rockville Pike, Bethesda, MD 20814-3998, USA for $40.00 American postpaid. Make checks payable to FASEB. Credit card orders [VISA or Mastercard (Eurocard)] may be FAXed to 301-530-7001 or phoned to 301-530-7027. Outside USA, please add $16.50 per report for air freight; otherwise delivery will be by sea/surface mail. Maryland residents, please add 5% sales tax.

OPRR Workshop on Care of Laboratory Animals

The National Institues of Health (NIH), Office for Protection From Research Risks (OPRR), is continuing to sponsor workshops on implementing the Public Health Service Policy on Humane Care and Use of Laboratory Animals. Each workshop will focus on a specific theme.

The workshops are open to institutional administrators, members of institutional Animal Care and Use Committees, laboratory veterinarians, investigators, and other institutional staff who have responsibility for high-quality management of sound institutional animal care and use programs.

The next workshop is scheduled for January 21–22, 1993, in La Jolla, CA; sponsored by Scripps Clinic and Research Foundation and Salk Institute. Contact Janie Partridge, Administrative Assistant, Scripps Clinic & Research Foundation/MB, 10666 North Torrey Pines Road, La Jolla, CA 92037. Tel: 619-554-8048; Fax: 619-554-8841.

1993 FASEB Summer Research Conferences

The 1993 FASEB Summer Research Conferences will be held in Saxtons River, VT, Copper Mountain, CO, and Snowmass, CO.

For information contact FASEB Summer Research Conference Office, 9650 Rockville Pike, Bethesda, MD 20814-3998. Fax: 301-530-7014.

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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* The Upjohn Company
Warner-Lambert/Parke Davis
Waverly Press
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* Second Century Corporate Founders

Wellcome Visiting Professorships

FASEB invites nominations for the Wellcome Visiting Professorships in the Basic Medical Sciences, sponsored by the Burroughs Wellcome Fund.

The professorships are offered annually to medical schools, universities, and other nonprofit scientific research institutions within the United States. Selected insitutions will *receive distinguished* scientists from within the United States or abroad whose interests relate to physiology, biochemistry/molecular biology, pharmacology, pathology, nutrition, immunology, cell biology, biophysics, and anatomy.

The fund provides an award of $1,500 and a plaque to the host institution for presentation to the Visiting Professor at the time of the Wellcome Lecture. The fund also provides $350 to each host institution to assist with some of the attendant expenses. Local expenses (meals, lodging, etc.) are borne by the host institution. Travel expenses for the Visiting Professor and an accompanying spouse will be reimbursed by the fund.

Applications should be made by the institution, not individuals who want to visit the institution. A prospective host institution should ascertain the nominee's interest and availability before submitting an application. Only one professorship will be awarded to an institution, and a person may serve as a Visiting Professor at only one institution.

The deadline for receipt of nominations is May 3, 1993. For information contact The Wellcome Visiting Professorship Program, Executive Office, FASEB, 9650 Rockville Pike, Bethesda, MD 20814-3998. Tel: 301-530-7090; Fax: 301-530-7049.

Dautrebande Prize Available

The Dautrebande Prize of approximately BF 4.500.000 (~$140,000) will be awarded during 1994. It is an international prize whose aim is to reward an author (or several authors who have been associated for a long time) for a human or animal clinical physiopathology project, preferably involving therapeutic implcations.

Application deadline is December 1, 1993. For information contact President of the Foundation, Jean Stalport, "Maison Batte," 3 Avenue Batta, B-4500 HUY (Belguim).

FASEB Women's Excellence in Science Lecture and Award

Nominations for the FASEB Women's Excellence in Science Lecture and Award 1994 are due by May 1, 1993. The award recognizes outstanding achievment by women in biological science; all women who are members of one or more of the societies of FASEB are eligible for nomination. Nominations should strive to recognize a woman whose research has contributed significantly to further understanding of a particular discipline by excellence in research. Nominations may be made only by members of the FASEB societies.

The award includes a $10,000 unrestricted research grant, funded by Eli Lilly and Company, travel expenses, complimentary registration at the meeting, and a plaque in recognition of the award. The awardee will present an Excellence in Science Lecture.

For information contact Leah C. Valadez, FASEB, 9650 Rockville Pike, Bethesda, MD 20814-3998. Tel: 301-530-7092.