THE PHYSIOLOGIST

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EDITORIAL

Communication Gap

During this century, the American system of research has nurtured the greatest medical progress ever known. Virtually all of the medical advances required animal research. This advancement, however, may be slowed, even halted, by the lack of communication.

As scientists, we cannot afford to ignore the public and its attitudes toward science. If freedom of inquiry is to be preserved, it is imperative for the biomedical research community to explain what it is doing, why it is done, and what benefits the research produces for society.

The public's attitude toward science was stated clearly by Donald Kennedy in his article, "The Anti-Scientific Method," which appeared in *The Wall Street Journal* (October 29, 1987). He said, "American science faces a worrisome new threat. It stems from a shift in the attitudes of the public at large. Its genesis is ignorance and fear of science itself and of the institutions in which it is done."

At present, the public's ignorance of science is best exemplified by the growing successes of the animal rights movement. The falsehoods communicated about animal torture, duplicate studies, and unnecessary experiments remain for the most part unchallenged. In the December *Physiologist*, I shared my attempts to counter such falsehoods. While the situation was far from ideal, it did provide an opportunity to educate the listening public.

Recently, I participated in a media training course sponsored by the Foundation for Biomedical Research. It was soon apparent that scientists are not equipped to be media stars. We tend to speak in jargon,

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Physiology Research in Zimbabwe

Harvey V. Sparks, Jr.
Department of Physiology, Michigan State University

In a recent issue of *The Physiologist* I described my "hands on" experience in teaching in Zimbabwe. In this article I would like to describe the highs and lows of conducting research in this developing country. I will assume that anyone who takes the time to read this has at least considered the possibility of spending time in a developing country and has a passing interest in how one might go about it. There are plenty of good reasons to entertain such a thought. One reason is the prospect of contributing directly to the welfare of two-thirds of the human race that was not born in an affluent nation. Another reason is the personal enrichment that one can derive from living and working in a different culture. There is also the possibility of doing unique research because of the opportunities available in some developing countries (more about that below). I think that for some physiologists, a year in a developing country can be the experience of a lifetime.

A sabbatical research project in a developing country has the usual seven phases: *1*) generation of an idea, *2*) attracting the necessary support, *3*) marshaling the supplies and equipment, *4*) obtaining permission to do the work, if it envolves human subjects, *5*) conducting the experiments, *6*) analyzing the data, and *7*) publishing the results. The unusual wrinkle is that several of these phases must be done within a year's time in unfamiliar surroundings that may not be suited for efficient use of one's time. I have a few comments on what I have learned about each of these phases.

Generating the Idea

A person may be drawn to a developing country because a research opportunity is uniquely available. This could result from environmental or cultural conditions to which the inhabitants are exposed, the availability of a certain animal or plant species, or the prevalence of a certain disease. Even if the primary reason for spending time in a developing country is not a unique research opportunity, I think it is a good idea to look around for one. It is axiomatic that if you plan to do the same work you would be doing at home, you should probably stay there. Few developing countries will be able to offer a research setting that will allow one to keep up the pace of his or her work. It is better to know that at the very least, the work could not be done anywhere else. For example, I came to Zimbabwe to work with a Zimbabwean graduate student who is doing his thesis research with me. We were interested in finding out why hypertension in Africa is associated with urbanization. We chose measure the effects large changes of dietary sodium and potassium have on arterial pressure and plasma levels of angiotensin II, atrial natriuretic factor, and aldosterone in rural and urban Zimbabweans. Despite many frustrations, we never had the feeling we would have been better off doing the study in East Lansing, Michigan!

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spewing out numbers or statistics. We also demonstrate our good manners by refusing to interrupt the animals rights activist delivering a litany of lies.

In dealing with the media, it is important to completely change one's style of presentation. Answers should be presented in an inverted pyramid style, which is a broad-based response that narrows down to the fine points. Also, responses should be constructed in a manner to simplify, clarify, and emphasize.

When encountering the media, we must remember that the "power of the press" is an appropriate phrase. The news media not only reflect public opinion but also shape the way the public views the issues.

The anti-science attitude of the public cannot be attributed solely to the media. The current environment involving blatant attacks on science—fetal research, animal experimentation, biotechnology, fraud, and deceit—arises from the research community's inability to communicate to the public the truths of the issues. We have failed to utilize the media to enhance society's confidence and to demonstrate that our enterprise serves the public's interest.

No matter how well we attempt to communicate with the public, the message seems to get lost in the noise arising from the animal rights community. During 1988, that noise should become even more intense as the activists turn their attention to Washington. The forthcoming reauthorization of several National Institutes of Health (NIH) institutes could result in efforts to attach restrictive laboratory animal amendments to the bill. The last time this tactic was utilized, NIH grant recipients were faced with revised guidelines for the use of animals. Unless the research community is willing to speak out on behalf of its enterprise, we might find ourselves faced with even more restrictive requirements.

No matter how well our message is being communicated, it needs to be constantly repeated and updated as developments warrant. However, it is important to remember that the message is not animals or fetal research or biotechnology. The issue is people. Every time our ability to perform research is hindered by restrictive legislation, a human being is condemned to suffering. If the biomedical research community is unable to obtain the answers through animal experimentation, it also will be unable to provide answers to reduce and, perhaps, eliminate human suffering.

Contrary to the arguments of the animal rights activists, the issue is not the little puppy dog; the issue is the infant tethered to a life-support system in the intensive care nurseries of our hospitals. If we speak out, we can win the battle.

Martin Frank

APS Publications Manager and Executive Editor

Brenda R. Rauner has been appointed publications manager and executive editor of the American Physiological Society. She had served those roles in an acting capacity since the death of Stephen Geiger in May 1987. Mrs. Rauner has been a member of the Society's staff since 1973 and for the last 13 years was the production manager and assistant to Mr. Geiger. Prior to joining the Society staff she worked in the publications departments at both the American Speech-Language and Hearing Association and Growth Stock Outlook. She is a native of London, England, and earned a baccalaureate degree in economics from the London School of Economic and Political Science. She came to the United States in 1954.

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

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Attracting Support

The support for our project came from a variety of sources. I had a Fulbright Lectureship, with the prime objective of supervising doctoral research. I brought some equipment with me from my laboratory at home. I know other individuals have been supported by private foundations and the National Institutes of Health. We also received support from the research council of the University of Zimbabwe. This university is quite generous in its support of research, as long as it is in the form of local currency. I believe this to be true of other universities in developing countries. The main challenge for someone on a sabbatical year is to figure out how to apply for support in time to make use of it during the year. I highly recommend working with the host departmental chairperson or other members of the academic staff who are in a position to help get a grant funded. This is a major reason that I strongly recommend a visit to the host department 6–12 months in advance of the sabbatical.

Marshaling the Supplies and Equipment

Once you have funding, there is no problem getting the supplies and equipment, right? Wrong. There are a number of obstacles. Most items will have to be imported, and in countries with closed economies it is necessary to obtain the foreign currency before a purchase can be made. This could take months or years if one is relying totally on local funds. In addition, it takes longer to conduct business with suppliers in the United States and Europe when you are several thousand miles away in a university that is unknown to the vendor. Also, one cannot make any assumptions about what is available locally. We need dry ice to keep our samples frozen in the rural areas. We are lucky: the local brewery can supply us. However, in another African country with a much larger population, dry ice is not available. An investigator working there has it shipped in from Paris. Laboratory rodents are bred on demand here, so if you need three-month-old guinea pigs you must alert the vivarium staff a little more than three months in advance. Again, an advance visit during which you sit down with the local staff is well worth the extra plane ticket.

Permission to do Research

Of course, any work on human subjects should be reviewed by the appropriate human use committee. This is unlikely to be a problem. However, there can be sensitivities that are hard for Americans to predict. For example, in Zimbabwe there is a highly vocal traditional healers' association that is not happy about foreigners who are studying the pharmacology and chemistry of traditional medicines. This group can present a problem for a physiologist studying, let us say, the effects of plants that promote labor on uterine smooth muscle. Furthermore, government ministries will not allow unauthorized work by foreigners that may be unnecessarily critical or may be of no potential benefit to Zimbabweans. The solution is to work closely with your local colleagues who know the ropes. It is not true that government bureaucrats will let you do what ever you want just because you are a distinguished American scientist who has generously decided to give a year of your life to a developing country. Some have found this revelation to be shocking.

Conducting the Experiments

With some luck you will not surpass a year before you finish the first four phases. In that case the fun begins. If the equipment does not break down and you have thought of everything you need in advance, it should be smooth sailing. In my case this meant going well out in the bush to a small missionary hospital that has power seven hours a day. Twenty peasants who have a traditional life-style generously donated their time so we could alter their dietary intake of sodium and measure their responses. It was a trick to get the blood samples spun down and the plasma on dry ice before the power cut off for the day. When the samples were on ice, we had the satisfaction of knowing that they were from people who were very distant from the influences of urban living. We shipped some of our plasma samples to the United States for two of the hormone assays. We will do those when we get home. Everything else is done at the university here in Harare.

Data Analysis

It is a good idea to bring along one's own computer for data analysis. Although there are computers available at the university, they are in demand and do not always use familiar operating systems.

It has been a lot of fun to discuss our findings with members the staff here, and they have had many good suggestions. We even got a small cardiovascular journal club going for a while. However, we are a long way from a critical mass of investigators with a detailed knowledge of the subject. In addition, access to the literature is cumbersome. Now I know how important it is to honor reprint requests from scientists in developing countries; they may not have access to primary source journals and may be depending on reprints as their lifeline to the literature.

Publication

I do not see this as a special problem for those of us who spend only a year overseas. The situation is very different for scientists who live in developing countries. Many find that getting their work published in international journals can be a big challenge. There are several reasons for this including inadequate familiarity with the language of the journal, difficulties in manuscript preparation, e.g., poor typing and lack of photocopying, difficulty in putting together an adequate bibliography because of a lack of journals, delays in the mail, and technical barriers to performing the experiments in the most rigorous fashion. I do not know what even the most sympathetic editor can do about this, except to be patient. I am sure that there are articles that would provide unique information that are not published because of the problems I have listed. This can be a crushing blow for a young scientist who is trying to keep his head above water in very trying circumstances.

In summary, conducting research in Zimbabwe has been a positive experience. The difficulties have been more than balanced by the fun of answering a question that I found to be very interesting. I also have a sense of having contributed something to the intellectual environment of the university. Perhaps the most important outcome will be future ties with colleagues in Zimbabwe who share an interest in cardiovascular research. Incidentally, it looks like there is no difference between rural and urban men in their pressor response to an increase in dietary sodium. We will have to look elsewhere for an explanation for the rise in blood pressure with urbanization. Does anyone want to give it a try?

1987 APS Annual Fall Meeting Support

The Society gratefully acknowledges the contributions received in support of the Annual Fall Meeting, San Diego, CA, from the following:

- Abbott Laboratories, Inc.
- American Cyanamid
- E. I. du Pont de Nemours & Company
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- Smith Kline & French Laboratories
- U.S. Office of Naval Research

PAST PRESIDENT'S ADDRESS

Entering the Forbidden Land

Reflections on the Centennial Year, American Physiological Society

Franklyn G. Knox, M.D., Ph.D.
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It was truly a great honor and privilege to serve as your President during the celebration of the 100th birthday of the Society. The Centennial year activities provided an excellent opportunity to review our heritage on the one hand and to project forward into the second century of the American Physiological Society on the other hand.

What could be more appropriate for an after dinner talk than to contemplate the American Physiological Society centennial plate. Indeed, our plate runneth over with the richness of our founders' foresight. I invited John Call Dalton to be with us this evening, since he was the first American full-time physiologist and an immediate predecessor of the founders of the American Physiological Society.

Dalton entered Harvard College at the tender age of 15 and in his second year was house pupil at the Massachusetts General Hospital when Morton demonstrated the use of ether (1). Dalton appears second from the left in this famous painting of the demonstration of the use of ether (Fig. 1). In Hinckley's painting, Dalton is described as the sleepy, red-haired boy. We can only imagine what is going through Dalton's mind at this time, other than perhaps, "Gee, it's difficult to see from here," but we can imagine that this demonstration provided the nidus for thinking that led to the use of anesthetized animals for medical research and teaching.

S. Weir Mitchell read an accounting of John Call Dalton's accomplishments before the National Academy of Sciences on April 16, 1980 (2). It was Mitchell who identified Dalton as our first professional physiologist. He noted that a physiological lecture was in that day a more or less well-stated resume of the best foreign books without experiments or striking illustrations. He stated it was like hearing about a foreign land that we were forbidden to enter. He was amused to remember how much of the physiology he had learned seemed to have only two dimensions. The imagination was freely called upon to aid us in our conception of active functions. Then Dalton began to teach that ether enabled us to do without pain what would have been cruel. He was prompt to see that a new era had opened for the teacher of physiology. Dalton himself began almost at once to illustrate with living animals the processes of life as he taught them in lectures.

Mitchell recounts his first impressions of seeing the living, moving heart in an anesthetized animal, "the swift certainty of the successive motions of this bounding thing filled me at once with a fresh conception of the delicacy and wonder of the vital mechanism amidst which I had been moving, so to speak, with the slightest realization of its marvel and mystery. Now at last

'I saw with heart serene
the very pulse of the machine.'

A single object lesson on the living heart, a thing unseen by me before or only heard or felt, left me with a never lost and most useful respect for the mystery of it all and a feeling of need for care which could not be too thoughtful" (2).

We had entered the forbidden land. We could marvel at the motions of living physiology.

Dalton was truly one of the pioneers of the transition of American physiology to the experimental era in teaching and research. However, his use of anesthetized animals sparked the first antivivisectionist agitation in this country. As Hermann Rahn recounts (1), his valiant defense finally culminated in the book *The Experimental Method in Medicine*, which sounded the keynote for all his successors.

Indeed, in 1987, the activities of the antivivisectionists are apparent at every turn. A float is prominently displayed in Washington on The Mall outside the Smithsonian Museum. The float is entitled, "The S. S. Vivisector." The theme is "Stop the Torture." Our responsibilities to educate the public and promote experimental medicine are obviously as important today as they were when the first antivivisectionists reacted to John Call Dalton's exquisite gift to mankind.

The antivivisectionists wish to revoke your passport to the land of living physiology. I know that each of you is active in your individual institution and community and The American Physiological Society is active on Capitol Hill to promote the appropriate use of animals in research and teaching. We took the opportunity of the Centennial to pay tribute and thanks to those enlightened members of Congress that withstood the onslaught of bags of mail from the antivivisectionists to the reasoned arguments of the physiologists. Con-

gressman Brown from the State of California was a cosponsor for the APS amendments to the Animal Welfare Act. We presented him with a medallion illustrating the five founders of The American Physiological Society as an expression of our appreciation and thanks for his support.

The medallion depicts the five founders of The American Physiological Society: Silas Weir Mitchell, Henry Newell Martin, Henry Pickering Bowditch, Russell Henry Chittendon, and John Greene Curtis.

The rendition of the five founders, as well as some contemporary physiologists, met with Vice President Bush to present the American Physiological Society Centennial Plate to the White House collection. Howard Morgan, Harvey Sparks, Marty Frank, Bill Samuels, and Aubrey Taylor witnessed the event. A replica of the original plate was presented to Vice President Bush, and he remarked that "Barbara will love the plate" and more importantly expressed appreciation for the contributions of physiologists to the health of Americans.

The original plate is on display in the White House plate collection, a fitting tribute to our predecessors and an inspiration to each of use as we enter the second century of American physiology, a renewed dedication to the principles established by our founders and a determination to evolve in the mainstream of modern life sciences for the second century. Our passport remains valid for the next leg of our journey.

Thank you very much indeed for the privilege of serving you at this most exciting moment in American physiology.

Presented at the American Physiological Society Fall Meeting, San Diego, CA, October 14, 1987.

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1. RAHN, HERMANN. Brief history of Department of Physiology at State University of New York at Buffalo 1846–1986. *The Physiologist, Suppl.* 29: 1–6, 1986.
2. MITCHELL, S. WEIR. Memoir of John Call Dalton, 1825–1889 In: *National Academy of Sciences Biographical Memoirs.* Washington, DC: Natl. Acad. Sci., 1985, vol. III, p. 177–185.

President Harvey V. Sparks, Jr., presenting a plaque to Franklyn G. Knox at the 1987 APS Fall Meeting, San Diego, CA.

APS NEWS

American Physiological Society 138th Business Meeting

Time: 5:15 P.M., Wednesday, October 14, 1987
Place: Town & Country Hotel, San Diego, CA

President Harvey V. Sparks, Jr.

As he called the 138th Business Meeting to order, President Harvey V. Sparks, Jr., expressed sadness about the death of Stephen R. Geiger, the Publications Manager and Executive Editor of the American Physiological Society, on May 31, 1987. Steve joined APS in 1969 and under his leadership the Publications Program flourished. He was responsible for the consistent excellence of the books and journals published by our Society. Steven will be sorely missed by all of us. All attendees stood for a moment of silence in honor of our friend Steve Geiger.

I. Call to Order

The agenda and ballot for the Election of New Members were distributed to the members along with the Proposed Amendment to the Bylaws to change the title of the Executive Secretary-Treasure to Executive Director. Dr. Sparks announced the selection of John B. West as parlimentarian.

II. Report on Membership

Aubrey E. Taylor, President-Elect, reported on the status of the membership and deaths since the last meeting.

A. Summary of Membership Status

Society membership is growing and doing well. Since the last meeting, 119 physiologists became members of APS, bringing the total to 6,476, which includes 4,725 Regular, 19 Honorary, 167 Corresponding, 757 Associate, 654 Emeritus, and 154 Student members.

B. Deaths Reported Since the Spring Meeting

Dr. Taylor read the names of those members whose deaths have been reported since the Spring Meeting and asked the members to observe a moment of silence in tribute to them.

Dr. Taylor expressed appreciation to the members for their efforts in proposing individuals for membership in the Society and conveyed the thanks of the Membership Committee Chairperson, Charles Levinson.

III. Membership

A. Appointment of Tellers

President Sparks instructed the membership to strike those names from the ballot for whom they did not wish to vote. A two-thirds majority is required to be elected to membership. Tellers Joey Granger, Lois Heller, Robert Gallavan, and David Mohrman were asked to collect the ballots for the Election of New Members.

B. Election of New Members

Following the tally of the ballots, Dr. Taylor stated that all candidates were elected to membership in the Society.

IV. Amendment to the Bylaws

President Sparks, in referring to the handout concerning the proposed amendment to the Bylaws, which was published in *The Physiologist* 30:46, 1987, announced that Council adopted a resolution to change the title of the Executive Secretary-Treasurer to Executive Director since the title more nearly reflects the responsibilities of the office. The title corresponds to that in current usage by similar organizations and facilitates the conduct of the office with extramural individuals and associations.

A motion was seconded and passed unanimously that the Society Bylaws be amended by changing the title of Executive Secretary-Treasurer to Executive Director.

V. State of the Society

President Sparks reported that Council has continued its examination of the ways in which the Society can foster the use of the tools of cellular and molecular biology by systems physiologists. Evidence of Council's concern with this issue was the excellent program arranged by Shu Chien and Jay Gargus for the Fall Meeting. The Program Executive Committee is now working with the Education Committee in planning similar initiatives at future meetings. The Education Committee whose chairperson is William Spielman is working on ways in which physiology graduate programs can assure that our graduate students are well versed in new technologies while maintaining their unique appreciation for systems biology, which is a major characteristic of physiology. Finally, the Long-Range Planning Committee, chaired by Ernst Knobil, will plot the future course of the Society's efforts to promote the integration of systems physiology and cell and molecular biology.

The changes in the governance of the Society that were approved at the Spring Meeting are being put into place. Because of the increased importance of the sections in the governance of the Society, R. Blake Reeves, the chairperson of the Section Advisory Committee, called a special meeting of representatives of the sections in Bethesda last May. As a result of this meeting and of vigorous activities by many of the sections over the summer, the Society is now experiencing greater involvement of the sections in leading the Society. This will be first noticed in the programming at the meetings and in the selection of Society officers. Members were encouraged to participate actively in their sections to assure that they respond to their sections needs in programming and in other activities of the Society. Those members who have not designated a primary section affiliation are urged to do so by contacting the APS Headquarters office in Bethesda.

The Council worked closely with Ernst Knobil to formulate a charge for the Long-Range Planning Committee to follow on the theme of the symposium organized at the Spring Meeting by the Association of Chairmen of Departments of Physiology on the coming *Golden Age of Physiology*. All members of Council agree that new technologies, including the tools of modern biology as well as techniques such as Magnetic Resonance Imaging and Positron Emission Tomography, open up new opportunities to answer the questions of physiologists. Council wants the Long-Range Planning Committee to help the Society to be positioned in such a way as to be able to be of maximum assistance to physiologists as we enter the new Golden Age.

Francis Haddy, chairperson of the Finance Committee, reported to Council that the success of both the Publications and Meetings Programs during the past year as well as the fund-raising efforts of Martin Frank have placed the Society in a very strong financial position. Because of this, Council did not need to discuss the possibility of a dues increase. Furthermore, there are resources to move quickly to implement the Society changes and to improve both the Publications and Meetings Programs.

The Bylaws were recently changed to open membership in APS to any qualified physiologist who is a resident of the Western Hemisphere. At this meeting, the Society is fortunate to have the attendance of a delegation of five members of the Latin American Association of Physiological Sciences, lead by Renato Albertini from Chile. Dr. Albertini has made a presentation to the Council concerning the needs of physiologists in Latin America for journals, books, supplies, and used equipment that may be available in the United States. APS members are encouraged to take the initiative in establishing contact with physiologists in Latin America. It is intended to increase communications with the Latin American Association so that the Headquarters office in Bethesda can be helpful to those of you with an interest in establishing contacts. Dr. Albertini invited all members of APS to attend the meeting of the Latin American Association, which will be held in Buenos Aires, Argentina, May 16, 1988.

APS Council. *Second row, left to right*: C. V. Gisolfi, J. A. Nadel, N. C. Staub, V. S. Bishop, E. Knobil, and S. Chien. *First row, left to right*: M. Frank, F. G. Knox, H. V. Sparks, Jr., and A. E. Taylor.

Left to right: R. Albertini (President, Latin American Association of Physiological Sciences), Mrs. R. Rosas, H. V. Sparks, Jr. (APS President), and Ramon Rosas (Secretary, Latin American Association of Physiological Sciences), 1987 APS Fall Meeting, San Diego, CA.

The Publications Committee, chaired by Paul Johnson, reported on the continued success of the journal and book program. Our new journal, *News in Physiological Sciences* (*NIPS*) has exceeded expectations in terms of subscriptions during its first year and a half of operation. This can be credited to its excellent editorial board chaired by Knut Schmidt-Nielsen. There are two new developments in the Publications Program. Council has endorsed the Publications Committee's consideration of the formation of a new section of the *American Journal of Physiology* entitled *AJP: Lung and Respiration*. The Publications Committee is very close to a final decision concerning that initiative. The Committee has been negotiating with a commercial press to publish our entire book program. It appears that the terms of the contract will be very favorable and will lead to a marked reduction in the price of books for our members.

The Program Executive and Advisory Committees, chaired by Carl Gisolfi, have been working hard to improve the quality of the meetings and all are pleased with the results of their efforts at the Fall Meeting. The program for next year's Fall Meeting in Montreal, October 9–14, 1988, looks excellent. The theme will be Growth, Development, and Aging with superb symposia on the topic each day. It was emphasized that the main purpose of the Fall Meeting is to serve as a venue for free communications, and abstracts in all areas of physiology are welcomed. The American Society for Pharmacology and Experi-

mental Therapeutics as well as the Canadian counterparts for both the physiological and pharmacological societies will be meeting with APS in Montreal. This will be an excellent meeting.

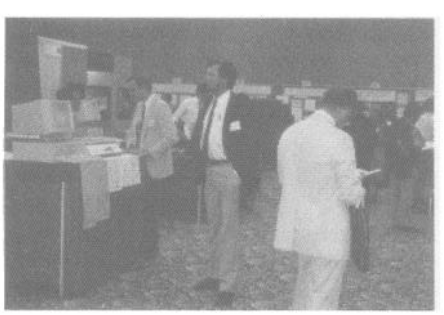
As sections become stronger, their representatives are taking the leadership in programming for the Society. Council urges members to participate in programming by working with their respective section representatives of the Program Advisory Committee.

The American Physiological Society has been a leader in fighting the excesses of the animal rights activists. Bill Samuels deserves thanks for his efforts on behalf of the members. There have been some genuine successes both at the local and national levels as a result of the efforts of the Society, but there is no doubt that these misguided individuals are making it more difficult to conduct animal research. It is time to plan an active and positive campaign to inform the public and their representatives of the inhumanity of the animal rights activists' position. Human beings suffering from disease deserve the fruits of animal research. Council has asked David Ramsay, chairperson of the Animal Care and Experimentation Committee, to work with a subcommittee of that Committee to develop a long-range plan to communicate the Society's views to the public. In addition, Council has adopted two resolutions that may be useful to those fighting the animal rights crowd (*The Physiologist* 30: 278, 1987.)

The Society has a grant from the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK) to support the travel of minority students and physiologists to APS meetings. The first 12 fellows of the NIDDK program attended the Fall meeting. Dr. Sparks thanked the members of the Society who acted as hosts for these minority fellows during the meeting and thanked Martin Frank, who spearheaded the program.

With no other business, the 138th Business Meeting was adjourned at 5:35 P.M., October 14, 1987.

Aubrey E. Taylor
President-Elect



Exhibits at the 1987 APS Fall Meeting, San Diego, CA.

American Physiological Society Statements on Animal Usage

The Use of Animals is Necessary for the Proper Teaching of Students of the Biomedical Sciences

The American Physiological Society believes the use of animals is important in the education of students in the biomedical sciences. The use of animals gives the student a direct understanding of how living systems work, an understanding that cannot be gained by reading a textbook, watching a video, or using a computer. To achieve the best biomedical education, students must have a complete learning experience including the use of laboratory animals.

October 1987

Animal Research is the Most Humane Response to Human Suffering from Disease

Depriving sick human beings of the benefits of animal research is inhumane and reprehensible. The American Physiological Society advocates the use of animals for research and teaching as the most human response to the need to relieve mankind from the suffering caused by disease. The use of animals is necessary if researchers are to combat illness, which affects both human beings and animals. The correct training of physicians and medical scientists also requires the use of animals for laboratory teaching. Textbooks, isolated cells, computer models, and other representations of the intact living organism can provide only a partial understanding of life processes for both the medical researchers and the student. Efforts to deny the human race the best possible curative power of modern sciences must be repulsed.

October 1987

Pound Animals

Unclaimed pound animals (random-source dogs and cats) have proved to be the most useful animals for the purposes of research and teaching. Medical advances benefiting both humans and animals were possible because of the availability of unclaimed pound animals for use in research. The American Physiological Society strongly believes that denial of the availability of random-source animals would be a catastrophic setback, and the Society strongly endorses the continued use of unclaimed pound animals for basic and clinical research and teaching.

April 1987

38th Annual APS Fall Meeting

The 38th Annual Fall Meeting, held October 11–15, 1987, in San Diego, California, marked the culmination of the Society's Centennial year. In conjunction with the Latin American Association of Physiological Sciences (ALACF) and The American Society of Zoologists Division of Comparative Physiology and Biochemistry [ASZ(DCPB)], the Society organized a program consisting of three major themes and a short course. The first theme, cosponsored by five APS sections and the ASZ(DCPB), consisting of four half-day sessions and two tutorial lectures, was devoted to "Hypoxia and Hypometabolism." The second theme, "Neural Principles of Pattern Generation," consisting of four half-day sessions, was organized by three APS sections. Theme three, which was devoted to "Molecular Kinetics and Biophysics in the Cardiovascular System," consisted of seven symposia, two workshops, and a tutorial session organized by three APS sections and representatives from BMES. To introduce the modern developments in molecular biology to physiologists, a short course entitled, "Molecular Biology and Physiology," was offered to attendees of the meeting. The course consisted of one half-day tutorial session, the one half-day symposium, and a series of five one-hour workshops presented by a number of biotech companies in a hands-on format.

At this year's meeting, Joseph Engelberg coordinated a workshop on the topic, "Integrative Study in Physiology and Medicine," that was based on a medical case history appearing in the *New England Journal of Medicine*. The Teaching Section presented a session on "The Medical Physiology Curriculum—Where We Are and Where We Are Going." In addition, the Liaison With Industry Committee organized a symposium on "Employment Opportunities for Physiologists." As a result of the award of a grant by NIDDK for a Minority Travel Fellowship Program, the Society also scheduled a NIDDK workshop on NIH Grant Programs that was open to fellowship recipients and other interested attendees.

The 1987 Bowditch Lecturer, D. Neil Granger, receiving a check from Franklyn G. Knox at the APS Fall Meeting, San Diego, CA.

Dr. Neil Granger was the 1987 Bowditch Lecturer, speaking on the "Role of Xanthine Oxidase an Neutrophils in Ischemia-Induced Microvascular Injury." Franklyn G. Knox presented the Past President's Address on the topic of "Reflections on the Centennial Year."

The scientific program for this 1987 Meeting consisted of 5 workshops, 5 practicum sessions, 2 tutorial lectures, 2 tutorial symposia, 18 symposium sessions, and 628 volunteered papers. Including the invited papers delivered in the tutorial lectures (2) and symposium sessions (116), the number of presentations totaled more than 746 scientific reports.

Of the volunteered papers for the Fall Meeting, 569 abstracts were contributed by APS members, 4 from ALACF members, 57 from ASZ(DCPB), and 25 from scientists belonging to both APS and ASZ. Scientists residing outside of the Americas contributed 42 abstracts. Industrial scientists accounted for 7 volunteered papers, and female scientists were first authors on 119 papers or 18.9% of the total.

Investigators in departments of physiology were responsible for contributing 180 papers. Other departments contributing significant numbers of papers include biology (58), medicine (38), zoology (22), surgery (16), pediatrics (12), pharmacology (9), biochemistry (9), kinesiology (9), and marine sciences (9). The remaining abstracts (54), identified with university departments, originated in 27 other types of departments. Of the volunteered papers, 53 came from scientists in United States Government laboratories, predominantly the Veterans Administration. Of the abstracts acknowledging research support, 275 received support from federal agencies (NIH, NSF, VA, Canadian MRC, etc.) and 104 received support from various private foundations, organizations, and/or companies.

Table 1 shows the programming of volunteered papers into slide and poster sessions based on the various APS sections and groups. The Cardiovascular and Respiration Sections of the Society programmed 128 and 123 papers, respectively, accounting for 39.9% of the volunteered papers programmed. As can be seen, 346 or 55.1% were scheduled in Poster sessions and 7.6% in Poster-Discussion sessions.

For comparison with the 1986 Meeting in New Orleans, Table 2 shows that the 1987 Meeting received 105 more volunteered papers. The increase in volunteered papers can be ascribed to two factors: *1)* the participation of the ASZ (DCPB) in the 1987 meeting and *2)* the attraction of San Diego for a meeting site. These two factors have helped to make this year's meeting a scientifically and culturally rewarding experience.

TABLE 1. **Programming of Volunteered Abstracts**

Section/Group	Volunteered Papers						
	Slide	Poster	Poster Discussion	Total	Slide	Poster	Poster Discussion
Cardiovascular	49	79		128	5	10	0
Cell and general	12	7		19	1	2	0
Comparative	50	47		97	4	5	0
Endocrine and metabolism		49		49	0	3	0
Environmental, thermal,- and exercise	44	25		69	3	4	0
Epithelial transport	10			10	1	0	0
Gastrointestinal	12	16		28	1	1	0
History				0	0	0	0
Muscle	32			32	0	3	0
Nervous system	12	14		26	2	1	0
Neural control and autonomic regulation	8		12	20	1	0	1
Renal	8	6		14	1	2	0
Respiration	19	68	36	123	2	4	2
Teaching		3		3	0	1	0
Water and electrolyte homeostasis	10			10	1	0	0
Total	234	346	48	628	22	36	3

TABLE 2. **Volunteered Papers by Physiological Category**

Category	1986 Papers		1987 Papers	
	No.	Percent	No.	Percent
Aging	3	0.57	1	0.15
Cell and general	16	3.06	9	1.43
Comparative	28	5.35	94	14.96
Endocrine and reproduction	37	7.07	30	4.78
Environmental, temperature, and exercise	48	9.18	69	10.98
Gravitational	4	0.76	6	0.96
Gastrointestinal and liver	15	2.86	29	4.62
Heart and circulation	126	24.09	128	20.38
Membranes and transport	14	2.68	12	1.91
Metabolism	12	2.29	20	3.18
Muscle	33	6.30	31	4.94
Neurobiology and neural biophysics	19	3.63	25	3.98
Regulatory and integrative	19	3.63	20	3.18
Renal and electrolyte	25	4.78	14	2.23
Respiratory	103	19.69	123	19.58
Water and electrolyte	14	2.68	10	1.59
History	2	0.38	2	0.32
Teaching materials	0		3	0.48
Other	6	1.14	4	0.64
Total	523	100.00	628	100.00

1987 Fall Meeting Statistics

Scientific Registration

Members	528
Nonmembers	293
Students	219
Retired Members	2
Others	35
Exhibitors	98
Press	3
Total	1,178

Section Report

Comparative Physiology

The Comparative Physiology Section held its annual business meeting at the APS Fall Meeting in San Diego. The present executive consists of M. Roger Fedde, Chairman; William H. Dantzler, Treasurer; William K. Milsom, Secretary; Albert F. Bennett, Councillor; and Larry I. Crawshaw, Program Advisory Committee Representative.

A number of issues received consideration at the meeting. *1)* The reorganization of APS was discussed and the implications of this for the roles of the individual sections in the function of Society. The role of the new Sections Advisory Committee was discussed by Blake Reeves, who currently chairs this new committee. There are two major outcomes of this reorganization that immediately affect the Section. The first is the need to amend our Bylaws to incorporate the changes in terms of office of the Section Executive required to allow the section to operate optimally within the new organization. The other is the need to recruit more members to raise the size of our Section further above the minimum cutoff for section status. *2)* The Program Committee reported on the status of upcoming meetings and the need for further proposals for symposia, tutorials, and workshop topics from the membership. *3)* On the basis of the results of a questionnaire sent out to the membership earlier in the year, it appears that the majority of our members wish to change the primary affiliation of the Section from the Fall APS Meeting to the Spring FASEB Meeting. A formal ballot will be prepared for distribution to the membership on this issue. *4)* Bill Dantzler made a brief report on the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*. He pointed out that given the relatively rapid rate with which manuscripts are processed by the journal as well as its lack of page restrictions, the journal is an excellent outlet for quality research in our field. He strongly encouraged all members to submit their best work to him. *5)* Alan Hargens, Ron Millard, and Steve Wood reported on the progress they have made in organizing a Memorial Symposium for Kjell Johansen to be held in conjunction with the IUPS Congress in 1989. Details of this symposium will be forthcoming at a later date.

The Fall Meeting of the APS in San Diego contained two themes cosponsored by the Comparative Physiology Section. This was a joint meeting with the Division of Comparative Physiology and Biochemistry of the Amercian Society of Zoologists and there was an exceptional turnout at the meeting. In all we sponsored or cosponsored eight symposia, two tutorials, one workshop, and nine contributed paper sessions. There were six contestants in the Scholander Award Competition, which was won by Lonnie P. Wollmuth of the Department of Biology, Portland State University. Lonnie was presented the Scholander Award by Mrs. Susan Scholander at a special Award Ceremony and Reception held at the Scripps Institution of Oceanography. Drs. Ted Hammel and Alan Hargens spoke about their associations with Peter Scholander at the ceremony, which was followed by a reception in the Scripps Aquarium. The Section thanks Alan and everyone else who worked so hard to make that evening so enjoyable. The Section also acknowledges the overall high standards of all the contestants in this year's competition and to thank them for their participation.

Scholander Award winner Lonnie P. Wollmuth receives his award from Mrs. Susan Scholander and Chairman Roger Fedde.

Future Meetings

1988	
FASEB Annual Meeting	May 1–5, Las Vegas
Joint APS/ASPET Fall Meeting	October 9–13, Montreal
1989	
FASEB Annual Meeting	March 19–23, New Orleans, LA
APS Fall Meeting	October 15–18, Rochester, MN
1990	
FASEB Annual Meeting	April 1–5, Washington, DC
APS Fall Meeting	October 7–10, Orlando, FL
1991	
FASEB Annual Meeting	April 14–18, Atlanta, GA
APS Fall Meeting	September 29–October 3, San Antonio, TX
1992	
FASEB Annual Meeting	April 5–9, Anaheim, CA
1993	
FASEB Annual Meeting	March 28–April 1, New Orleans, LA

News From Senior Physiologists

Letters to Roy O. Greep:

David Bishop writes "Your letter concerning my 75th did my heart good." He regretably spent his birthday as hospital patient rather than advisor learning "more about the urogenital system than I ever wanted to know" but is now nearly ready to get back in circulation. For several years he and his wife have been "homesteading in Down East Maine, right on the coast, in a little old lobsterman's village" named Corea. Since leaving the Medical College of Ohio, he has been spending some time with past doctoral students and working on a history of the Society of General Physiologists.

(*Continued on p. 12*)

PUBLIC AFFAIRS

Stage is Set for Congress to Consider New Restrictions for Laboratory Animal Use

The stage is set for animal rights advocates to push the Congress for new restrictions on the use of laboratory animals.

It has been more than two years since animal rights advocates have actively sought legislative reforms from the Congress. Instead, the advocates have been pushing both state and local governments in 39 states to enact laws that would prohibit the release of unclaimed pound animals to research and educational institutions. (Such prohibitions already exist in 11 states.)

However, while local chapters of the animal rights organizations were campaigning in the statehouses and courthouses, their national organizations were preparing for the second session of the 100th Congress by having Congressional members who support animal rights introduce a handful of bills early in the first session with no effort being made for committee action.

The strategy of the national organizations appears to be to get their proposals into the legislative hopper at the outset of the Congressional period and then wait for the opportune time to push the proposals as amendments to an authorization or appropriations bill. The most likely opportunity to push for such amendments will be in late spring when the Congress takes up the bill to reauthorize several institutes at the National Institutes of Health (NIH). (This same tactic during the 99th Congress resulted in revised guidelines and requirements for NIH grant recipients using laboratory animals.)

The proposals most likely to be considered and the animal rights organization promoting the legislation are

- **Pet Protection Act of 1987** (HR. 778–Mrazek, D–NY; S.1476—Ford, D–KY). Both bills would make any NIH grant recipient ineligible for federal funds if pound animals are used for any purpose regardless of the source of funding to obtain the animals. The bills were prepared by The Humane Society of the United States.
- **Humane Products Testing Act of 1987** (HR. 1635—Boxer, D–CA). The bill would prohibit the use of LD-50 tests except under some limited circumstances. The bill was prepared by the Coalition to End the Draize and LD-50 Tests.

Legislative Impact

The Animal Care and Experimentation Committee will conduct a workshop on the "Impact of Legislation on Research Involving Animals" at the Society's Spring Meeting on Monday, May 2, from 11:30 A.M. to 1:30 P.M. in Room T-2 of the Las Vegas Convention Center.

David J. Ramsay, University of California at San Francisco and chairman of the committee, will moderate the panel composed of Charles McCarthy, NIH; Richard J. Traystman, The Johns Hopkins University Hospital; Allen W. Cowley, Medical College of Wisconsin; Frederick King, Yerkes Primate Research Center; and William M. Samuels, APS.

- **Information Dissemination and Research Accountability Act of 1987** (HR.1708—Torricelli, D–NJ). The bill would establish a national center for the purpose of reviewing all grants approved for funding and involving the use of animals. The Center would have the authority to veto a grant if the staff believed the work was duplicative. The bill was prepared by the United Action for Animals.
- **Private Civil Suits to Enforce the Animal Welfare Act** (HR 1770—Rose, D–NC). This bill would amend the Animal Welfare Act to permit private citizens to sue the United States Department of Agriculture on behalf of animals protected by the Animal Welfare Act. The bill is an attempt to gain standing in the courts by animal rights activists who were denied such recognition by the United States Supreme Court. The bill is believed to have been prepared by the People for the Ethical Treatment of Animals.
- **Release of the Silver Spring Monkeys to Primarily Primates** (HR 2883—Smith, R–NH). The Bill would require NIH to transfer the custody of 14 confiscated monkeys to Primarily Primates, an animal rights installation in Texas. The monkeys were taken in a 1981 police raid at a Silver Spring, MD, research laboratory. The bill is believed to have been prepared by the People for the Ethical Treatment of Animals.
- **Protection of Farm Animals Used in Nonagricultural Research and Unnecessary Surgery and Alteration to Animals Bill** (HR 3233—Towns, D–NY). The bill would amend the Animal Welfare Act to include within the scope of the Act all warm-blooded animals used in research and exhibitions and would prohibit surgery that would cause injury or disfigurement to an animal. The bill was prepared by the American Society for the Prevention of Cruelty to Animals.

[In addition to these bills there are two resolutions in the House, both introduced by Andrew Jacobs, a Democrat from Indiana. One (HCR 19) urges the end of the Draize Test; the other (HCR 190) condemns the use of rapid decompression as a method of animal euthanasia. While a resolution passed by the Congress does not have the force of law, it often portends Congressional initiatives.]

Of the six bills waiting in the wings, the Pet Protection Act of 1987 is expected to get the biggest push from the animal rights advocates inasmuch as its passage would effectively put an end to the question of releasing unclaimed pound animals at the state and local levels.

Prior to last year the Coalition for Pets, an umbrella organization sponsored by The Humane Society of the United States for animal rights organizations seeking to end pound release at the grassroots, had been successful in adding both Massachusetts and Maryland to its list along with several municipalities. But last year the Coalition's grassoot initiatives lost significantly in Arizona, Florida, Montana, and New Mexico and were stalemated in other states. Thus, the impetus for federal restrictions on the use of unclaimed pound animals has gained in importance for the Coalition.

Other factors that come into play regarding this bill: *1)* there are pet protection bills in both Congressional chambers, and *2)* there is talk in a House subcommittee of conducting hearings on this bill and, perhaps, some of the other animal bills.

Congressional consideration and action on a pet protection bill, or any other bill for that matter, will depend largely upon the response the Congress receives from the scientific community. Recent history has shown that the scientific community did not respond significantly in 1985 when animal reform legislation was enacted by the Congress, but in 1987 the scientific community did flex its collective muscle and stymied the promulgation of rules proposed for the Animal Welfare Act and stopped efforts to enact restrictive legislative measures at the grassroots.

If the anticipated challenges of the animal rights advocates to seek new federal restrictions are to be met, then last year's efforts by the scientific community will have to be repeated in 1988.

William M. Samuels

Anthonie Van Harreveld (1904–1987).

It is with deep sadness that we learned of Dr. Anthonie Van Harreveld's death on August 14th, 1987.

Van was born in Haarlem, the Netherlands, on February 16, 1904. While he was a young medical student, he was attracted to science. As a young investigator he worked with, among others, Drs. G. van Rynberk and J. ten Cate. With his colleague and good friend C. A. G. Wiersma, he left Holland in 1934 to come to the then new California Institute of Technology.

It was at Cal Tech that he pursued his long and fruitful career in experimental physiology, working mostly on problems in the field of neuroscience. In his earlier years at Cal Tech he published a series of fundamental papers with Kees Wiersma on the innervation of crustacean muscles. For use in such studies he devised a physiological medium, and Van Harreveld's solution still remains in worldwide use today.

During the years of World War II, Van pioneered in showing that mammalian motor nerves send out collateral sprouts to reinnervate nearby denervated muscle fibers. Other studies carried out at that time were on the properties of electronarcosis, electroshock, and cortical seizures. One of his major concerns dealt with the effects on the nervous system of anemia produced by circulatory arrest. In the spinal cord this causes a muscular rigidity of the limbs, which he interpreted as a loss of inhibition of the motoneurons.

Studies on the effects of interruption of the blood supply to the cerebral cortex led to a major and long-lasting interest in the phenomenon of cortical spreading depression of Leão, studies I was privileged to work with him on. Electrical impedance measurements indicated the presence of a fairly large extracellular space of some 20–25% in the normal cortex, and when spreading depression passed through a region, that space became considerably reduced. The concept developed was that as the wave of spreading depression passed by, sodium and chloride in the extracellular space passed into the cells along with water. This caused the cells to swell with a reduction in the electrical conductivity and size of the extracellular space. At the time, however, electron microscopic pictures had convinced almost everybody else that the extracellular space normally present in the central nervous system was small, of the order of 3% or less. That

would follow from the shift of ions and fluid from the extracellular space into the cells, which we found to take place soon after the cortex was made anemic. Such a shift likely occurs in tissues removed from the animal and prepared for electron microscopic examination.

Studies made using freeze-substitution later carried out by Van and his colleagues further confirmed the presence of the larger extracellular space in the normally circulated cortex by fast freezing the tissue in situ. Histochemical studies of the freeze-substituted tissue further showed the expected uptake of chloride by the cells when a wave of spreading depression occupied a cortical region. Only recently, with the evidence obtained by others, using ion-selective electrodes, of the large ionic shifts in the cortex occurring during spreading depression, has belated recognition been given to the earlier studies showing the presence of a larger space and the concept of ionic and water shifts during spreading depression.

The technique of slam freezing developed by Van and his colleagues to show the extent of the extracellular space in the cortex was also used to study form changes at synaptic junctions, and this related to behavioral changes. This methodology found important applications in studies of fast-changing events in other laboratories, e.g., of vesicle exocytosis in motor nerve terminals following stimulation. In later studies of spreading depression, the role of glutamate in its propagation in the cortex and the analogous spreading changes in the retina were investigated.

In 1975 Van was honored upon his retirement as Professor at the California Institute of Technology after his 70th birthday by an issue of the Journal of Neurobiology (vol 6, No. 1, 1975) with papers contributed by some of his former students and colleagues. It included his bibliography up to that time. A glance at the list shows how wide his interests were and the many colleagues who were associated with him over the years, usually one or less often two at a time, working together with him daily in his laboratory. It came as no surprise to those who knew him that after his formal retirement he continued to work as Professor Emeritus on his research with the energy of a man half his age until only very recently in his last year when illness forced him to leave the laboratory.

Those of us who were privileged to have been closely associated with Van have warm memories of him remaining, memories of the spirited interplay of ideas and the excitement and enjoyment in the work of the laboratory we experienced with him. Above all there was his gentleness and the inspiring example he set. He was kind and modest but also courageous and forthright in the defense of his ideas in spite of the pressure to conform to concepts generally accepted at the moment. Also, along with his wholehearted devotion to the search for the truth, there was the desire that the results would serve medicine for the betterment of others. He embodied for us the true calling of scientist as well as being a good person and true friend.

We share his loss with his wife Truus, his son Anthonie, his daughter Frieda Ford, and his five grandchildren but derive comfort from the realization that those fine qualities of his that made him outstanding will live long in all our memories.

Sidney Ochs

PEOPLE AND PLACES

R. John Solaro, Ph.D., professor of physiology, University of Cincinnati, has become chairman of the Department of Physiology and Biophysics, University of Illinois at the Medical Center, Chicago.

Formerly in the Division of Pulmonary Medicine, University of Pittsburgh, **Jean E. Rinaldo**, M.D., has moved to Vanderbilt University School of Medicine, Nashville.

Jerod M. Loeb, Ph.D., professor of physiology, Northwestern University Medical School is also director of the Department of Basic Sciences, American Medical Association, Chicago.

After a sabbatical in France, **Don W. Watkins**, Ph.D., has returned to the Department of Physiology, George Washington University, Washington, DC.

Steven P. Driska, Ph.D., formerly at the Medical College of Virginia, has accepted a position in the Department of Physiology, Temple University School of Medicine, Philadelphia.

The new chairman of the Department of Physiology, Temple University School of Medicine, Philadelphia, is **Peter R. Lynch**, Ph.D., who has been professor of physiology at that institution.

Douglas G. Stuart is the acting chairman of the Department of Physiology, University of Arizona, College of Medicine, Tucson. **Paul C. Johnson**, who has been chairman since 1967, is stepping down.

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.

Fulbright Scholar Awards

The Council for International Exchange of Scholars announced that more than 900 scholars, academics, and professionals have received awards under the Fulbright Scholars Program to travel, lecture, consult, and conduct research abroad in 1987–1988. APS members who received the award are listed with the country where teaching or research will be conducted:

Ching-Chung Chou, professor of physiology, Michigan State University, East Lansing: Brazil.

Frank P. Conte, professor of zoology, Oregon State University, Corvallis: Australia.

Richard A. Freedland, professor of physiological sciences, University of California, Davis: Australia.

Lawrence Goldman, professor of physiology, University of Maryland, Baltimore: West Germany.

Herbert Levitan, professor of zoology, University of Maryland, College Park: Yugoslavia.

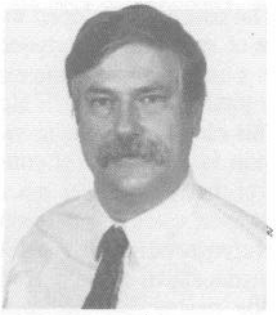
Jose P. Segundo, professor of anatomy, University of California, Los Angeles: Uruguay.

Hammer Prize

Bernard Fisher, M.D., was one of three scientists who shared the annual $100,000 Hammer Prize for cancer research. A member since 1956, Fisher is professor of surgery at the University of Pittsburgh School of Medicine.

EDUCOM Award

Richard A. Meiss, Professor of Physiology/Biophysics and OB/GYN, Indiana University School of Medicine was cited for writing the best software simulation by EDUCOM at its annual conference in Los Angeles. EDUCOM is a consortium of over 500 colleges and universities that promotes the development and dissemination of instructional software for higher education. Dr. Meiss' simulation, "Mechanical Properties of Active Muscle," is a computer program that enables first-year medical students to perform simulated experiments that illustrate important aspects of skeletal muscle physiology. Dr. Meiss received the $5,000 EDUCOM Award, which was based on scholarship, ease of use, importance to the curriculum, and other factors.



Richard A. Meiss

APS NEWS

(Continued from p. 9)

E. S. (Manny) Mendelson writes that he is quite well and active in nonphysiological pursuits. Almost twenty years ago a succession of minor operations left him a semi-invalid to the point that he was advised not to lift anything heavier than a book for the rest of his life. Taking matters into his own hands, he embarked on a program of vigorous exercise, climbing, swimming, and hiking and brought about complete recovery with no recurrences in 17 years. With his home in Harleysville, Pennsylvania, being near the Limerick nuclear reactors, he has kept busy "trying to bring an end to the madness of all nuclear energy 'generation,' futile though my efforts seem to be." He sends his "warmest regards to the diminishing band of friends and former colleagues as well as to newer members of the Society."

Mary Brazier writes "It is good of the Physiological Society to be interested in its members." She is still at UCLA with the appointments as Professor of Anatomy and of Physiology. When she received the letter she was at work correcting proots for her forthcoming book *A History of Neurophysiology in the 19th Century*. The first volume on the 17th and 18th centuries appeared in 1984, "I now move on to the first half of the 20th century—a great period for our science."

Roger Grief reports that, although officially retired from Cornell University Medical College, he is still in charge of the Endocrinology course for first-year Medical Students and occasionally does an experiment related to the action of thyroid hormones at the cellular level. He taught for four months in Taiwan, has a connection with a hospital in France, and also serves on the board of a Settlement House in New York City. All of this has kept him sufficiently well occupied to avoid making third-rate furniture in the basement or painting fourth-rate landscapes. "Words of wisdom to the young? . . . There is one thing I remember from a psychiatrist who taught at Johns Hopkins School of Medicine, where I finished in 1941. It is 'Cultivate resting points of satisfaction.'"

POSITIONS AVAILABLE

Cell Physiologist. Tenure track position for Fall 1988 at the rank of Associate or Full Professor. Ph.D. in Physiology and postdoctoral experience are required. Candidates must have a demonstrated record of independent research and ability to obtain funding for research. Submit application to Dr. Rajen Anand, Chairman, Department of Anatomy and Physiology, California State University, Long Beach, California 90840, by January 15, 1988. California State University, Long Beach, is an equal opportunity/affirmative action employer.

Applied Biomathematics and Computer Science, Tenure Track Position. The University of Pennsylvania School of Veterinary Medicine is seeking applicants with credentials in applied biomathematics and computer science to join its professorial faculty. Qualified individuals must have an advanced degree in biomedical or agricultural science and a doctorate in mathematics, computer science, or physics, in addition to demonstrated ability to lead an academic program in biomathematics, statistics, and computer science in a veterinary or animal science environment. Major emphasis will be placed on the candidate's experience in development of computer software for mathematical modeling and its application to the understanding of the behavior of biological systems at the cellular, whole organism, and population level. The successful candidate will participate in existing programs in integrated animal health outreach, food animal epidemiology, and health economics and clinical nutrition. Experience in modeling applications in a variety of biomedical and agricultural systems is desirable. The candidate will be expected to develop a viable academic program in computer science and applied biomathematics and provide leadership in the establishment of computer facilities in the School of Veterinary Medicine. The individual would also be expected to develop interdisciplinary collaborative programs in computer and biomedical sciences with other schools of the University and elsewhere beyond the Veterinary School. Demonstrated ability to direct major computer software development projects and obtain competitive research support is essential. Qualified applicants should submit a curriculum vitae and names of five referees to: Dr. Robert H. Whitlock, Chairman, Department of Clinical Studies, New Bolton Center, University of Pennsylvania, School of Veterinary Medicine, 382 West Street Road, Kennett Square, PA 19348. The University of Pennsylvania is an equal opportunity employer.

Minority Student Summer Intern Program. The Medical Research Division, American Cyanamid Company at Lederle Laboratories, has positions for undergraduate and graduate students majoring in the biological and chemical sciences in its Minority Student Summer Intern Program. This program allows the students to participate in research activities for approximately 10–12 weeks during the summer, with compensation. We are making an extra effort to assure that minority students have an opportunity to participate in the program and would like your assistance in identifying qualified minority candidates from your institution who are also U.S. citizens. This program is intended to assist students during their education and we would much prefer that the nominees be committed to returning to school at the beginning of the academic year. We would like you to select a **maximum of two students** and have them submit a resume, transcript, and letters of recommendation no later than March 4, 1988.

Information: David L. Crandall, Ph.D., Chairman, Cyanamid Equal Employment Opportunities for Professionals Committee. Phone (914)732-4051.

APS Membership Applications

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

Positions Available

There is a $25 charge per issue for each position listed. A check or money order payable to the American Physiological Society must accompany the copy. Purchase orders will not be accepted unless accompanied by payment. Ads not prepaid will not be printed. Copy must be typed double-spaced and limited to 150 words. All copy is subject to the editorial policy of *The Physiologist*. EOAAE indicates Equal Opportunity/Affirmative Action Employer and appears only where given on original copy. Copy deadline: copy must reach the APS office before the 15th of the month, 2 months preceding the month of issue (e.g., before December 15 for the February 1987 issue). Mail copy to APS, 9650 Rockville Pike, Bethesda, MD 20814.

BOOKS RECEIVED

Neurotransmitters and Epilepsy. Phillip C. Jobe and Hugh E. Laird II (Editors). Clifton, NJ: Humana, 1987, 376 pp., illus., index, $69.50.

Annual Review of Cell Biology (vol. 3). G. E. Palade, B. M. Alberts, and J. A. Spudich (Editors). Palo Alto, CA: Annual Reviews, 1987, 502 pp., illus, index, $31.00.

Cell Volume Control: Fundamentals and Comparative Aspects in Animal Cells. Current Topics in Membranes and Transport (vol. 30). R. Gilles, Arnost Kleinzeller, and L. Bolis (Editors). Orlando, Florida: Academic Press, 1987, 289 pp., illus., index, $75.00.

Molecular Basis of Lymphokine Action. David R. Webb, Carl W. Pierce, and Stanley Cohen (Editors). Clifton, NJ: Humana, 1987, 481 pp., illus., index, $74.50.

Designing Resistance Training Programs. Steven J. Fleck and William J. Kraemer. Champaign, IL: Human Kinetics Books, 1987, 264 pp., illus., index, $24.00.

Childhood Pain: Current Issues, Research, and Management. Dorothea M. Ross and Sheila A. Ross. Baltimore, MD: Urban & Schwarzenberg, 1987, 384 pp., illus., index, $39.50.

Lung Function in Children and Adolescents. H. Herzog (Editor). *Progress in Respiration Research* (series, vol. 22). A. Zapletal, M. Samanek, and T. Paul (Editors). Basel: Karger, 1987, 220 pp., illus., index, $116.75.

In Vivo Body Composition Studies. K. J. Ellis, S. Yasumura, and W. D. Morgan (Editors). London: IPSM 3, 1987, 476 pp., illus., index, $75.00.

Human Circulation: Regulation During Physical Stress. Loring B. Rowell. New York: Oxford University Press, 1986, 416 pp., illus., index, $39.95.

Hypoxia, Polycythemia, and Chronic Mountain Sickness. Robert M. Winslow, and Carlos Monge C. Baltimore, MD: Johns Hopkins University Press, 1987, 255 pp., illus., index, $50.00.

The Aging Mouth. Frontiers of Oral Physiology (series, vol. 6). D. B. Ferguson (Editor). Basel: Karger, 1987, 175 pp., illus., index, $79.50.

The Physiology of Reproduction. Ernst Knobil and Jimmy D. Neill (Editors-in-Chief). Larry L Ewing, Gilbet S. Greenwald, Clement L. Markert, and Donald W. Pfaff (Assoc. Editors). New York: Raven, 1987, 3,600 pp., illus., $275.00 (Effective until March 1, 1988: $240.00).

ANNOUNCEMENTS

International Symposium

D. Bruce Dill's Milestones in Environmental Physiology: Age, Body Hydration and Stressful Environments. The IUPS Commission on Environmental Physiology is honoring Bruce Dill with an international symposium on his milestones in environmental physiology at the University of Nevada, Las Vegas, NV, April 30, 1988. The symposium will be jointly sponsored by the IUPS Commission on Environmental Physiology, University of Nevada, the Institute of Environmental Stress at the University of California, Santa Barbara, and the American Physiological Society. *Information:* M. K. Yousef, University of Nevada, Department of Biological Sciences, Las Vegas, NV 89154.

Hypoxic Group Meeting

The second annual meeting of the Hypoxic Group will be held May 3 at the 1988 Spring FASEB Meeting in Las Vegas, NV. The speakers will be **James W. Fisher**, whose theme will be "The Role of Hypoxia in the Regulation of Kidney Production," and **John A. Krasney**, whose theme will be "Integrated Cardiovascular and Endocrine Response of Hypoxia." *Information:* R. W. Hoyt (617) 651-4802.

International Society of Heart Research

The Tenth Annual Meeting of the International Society of Heart Research will be held June 26–29, 1988, at the Williamsburg Hilton Hotel, Williamsburg, VA. The topics to be covered are the study of normal physiology and the altered pathophysiology of cardiovascular injury, with specific reference to the myocardium. *Information:* A. Potter, OCE, Medical College of Virginia, Box 48, MCV Station, Richmond, VA 23298-0001. Phone: (804) 786-0494.

Commission on Professionals in Science and Technology

Salaries of scientists and engineers up modestly, but keep abreast of inflation. Salary gains have been modest over the past two years for scientists and engineers, up between 3 and 4%, keeping slightly ahead of inflation. However, the job market, particularly for new graduates in technical fields, was extremely tight, with offers down after 30% over the past year, according to a new master report by the Commission on Professionals in Science and Technology. **Salaries of Scientists, Engineers, and Technicians** outlines changes primarily from 1985 to 1987, utilizing 247 tables of salary data from more than 50 salary surveys to provide a broad range of information on starting and advanced salaries by field, experience level, degree level, and type of employer, with differentials by sex, type of job, and geographic area. Some of the findings:

Demand Down Precipitiously—Slight Salary Increases for New Graduates

- The volume of offers to new graduates at the bachelor's level dropped about 25% from 1986 to 1987, with graduates in technical disciplines facing an extremely tight job market. Salary offers rose only slightly, if at all, to engineering graduates. Petroleum engineering, the discipline that has consistently garnered the highest salary average, showed a 6.6% drop in average salary to $30,816 and a resounding 82% decrease in the number of job offers. The recruiting picture for computer science graduates this year is not as bright as in the past, with job offers down 28% and a slight drop in average starting salary to $26,364.
- Biological science graduates, who traditionally received the lowest dollar offers in the science category, recorded salary increases of 14% to $21,816 and were replaced at the bottom of the salary schedule by graduates in agriculture. Humanities graduates received 29% more offers and experienced a salary increase of 5%.
- Regardless of discipline or degree level, those graduates beginning their professional careers in industry reported higher starting salaries than did those working in any other employment setting.

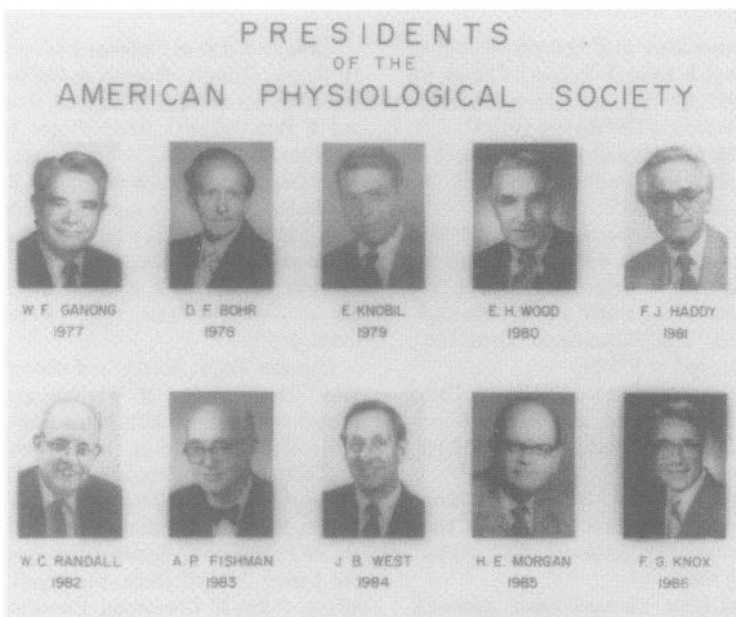
Where You Work, What You Do, What Degree You Hold, Your Field, and Your Experience level All Make A Difference in Pay

- Doctoral scientists and engineers working in industry received the highest median salary, $52,000, while those working in elementary/secondary schools earned the least. Teaching, the dominant work activity of doctoral scientists and engineers, continues to provide the lowest annual salary, while those doctoral scientists and engineers working in management or administration of research and development earn the most.
- Among scientists and engineers working in research and development, those conducting pure research in a nonmanufacturing organization earned the highest salaries. The more experience one had, the higher the salary. Research and Development scientists and engineers employed in educational institutions reported the lowest salary. Among nonsupervisory scientists and engineers working in research and development, nuclear and reactor engineers reported the highest average salary at the bachelor's level, while electrical and electronic engineers reported the highest salary averages at both the master's and doctoral levels. As in the past, agricultural and biological scientists are the lowest paid at all three degree levels.
- Salaries for data-processing personnel are still increasing but at a much slower pace than in the past. Generally, manufacturing employers pay the highest salaries to data-processing personnel, and those working on the east and west coast of the country report higher salaries.
- The median salaries for nonacademic chemists were up only slightly from 1986 to 1987 at the bachelor's and master's levels and down somewhat at the doctoral level. Chemists and physicists as well as all other scientists and engineers earn the most working as managers in industry, while those teaching earn the least.
- Experienced engineers are reporting salary increases between 3 and 5%, with those employed in supervisory positions earning higher salaries than nonsupervisors. Engineers employed in executive/administrative areas earn more than those who remain in straight engineering. Generally, those engineers working on both the east and west coasts report the highest average salaries regardless of discipline, type of employer, or work activity.

Faculty Salaries Outpacing Inflation

- Faculty salaries are up nearly 6% in 1986–87 to an average $35,470. After accounting for inflation, the increase is about 4%, the biggest rise in 15 years. However, faculty salaries vary considerably by discipline. Newly hired assistant professors in fields where academe is competing for talent with private industry, such as accounting, engineering, and computer science, earn substantially more than the average for all newly hired assistant professors.
- Engineering professors earn the highest salaries among the science and engineering disci-

(*Continued on p. 16*)



APS Presidents (1977–86). Available from the APS Executive Director, 9650 Rockville Pike, Bethesda, MD 20814 ($20.00 per photograph).

(*Continued from p. 14*)

plines, both at public and private institutions. Overall, faculty members earn less, on the average, working in public institutions than in independent private ones.

Salary Differences Between the Sexes Still Very Evident

- Although beginning salary offers to women in engineering and accounting were comparable with those made to men, offers in other fields were lower for women. One of the widest salary gaps between men and women was in the biological sciences, where women received average starting salaries 11.2% lower than men.
- Women doctoral scientists and engineers continue to earn considerably less than their male counterparts regardless of field or experience level. Overall, women earn 23% less than men. By field, women who received their Ph.D. in engineering reported the highest median salary, while those who received the doctorate in agricultural sciences earned the least.
- Women continue to earn substantially less than their male colleagues working in research and development, regardless of field or degree level. Although salaries are approximately equal in the first few years after graduation, men's salaries rise faster than women's, so that the salary gap increases over time.
- Regardless of occupation, from managerial and professional to technical, sales, and administrative support, women reported lower earnings than men in similar positions at similar experience levels.
- Men are paid more than women faculty regardless of discipline, type of institution, years of experience, or rank. However, the salary gap is somewhat less than in earlier years.

This new report makes possible a close comparison of salaries in every field of science and engineering (as well as some comparative information in other fields) and at every degree level for professionals employed in business, government, universities, and other employment sectors.

Salaries of Scientists, Engineers, and Technicians—A Summary of Salary Surveys by Eleanor L. Babco (Washington, DC, Commission on Professionals in Science and Technology, 224 pp., 13th Ed., October 1987) is available for $45 prepaid from the Commission on Professionals in Science and Technology, 1500 Massachusetts Ave. NW, Suite 831, Washington D.C. 20005.

The Commission is a private, nonprofit corporation founded in 1953 by the major professional societies in the sciences to oversee and report on factors affecting the recruitment, education, and utilization of scientists and engineers. Membership is open to individuals, institutions, societies, and corporations with similar interests and goals.

Physiology in Perspective: Walter B. Cannon Memorial Lecture Wednesday May 4, 1988

The Director of the British Heart Foundation NMR Research Group will deliver the Walter B. Cannon Memorial Lecture at the Spring Meeting of the American Physiological Society in Las Vegas.

George K. Radda will discuss "Adaptation, Control, and Bioenergetics in Health and Disease—Noninvasive Human Biochemistry Through NMR" at 9 A.M. on Wednesday, May 4, in Las Vegas, NV. The semiannual business meeting of the Society's membership will follow the lecture.

Radda, who has served as the director of the NMR research group since 1983, also is a British Heart Foundation Professor of Molecular Cardiology and a professorial Fellow at Merton College, Oxford University. He has been associated with Oxford University since 1961, and in 1962–63 he was a research associate at the University of California in Berkeley. He is the author of more than 400 publications.

The Cannon lecture, which focuses on physiology in perspective, is sponsored by the Grass Foundation.

Latin American Physiological Society, XVI Congress

The Organizing Committee is pleased to invite you to take part in the XVI Congress of the Latin American Association of Physiological Sciences, scheduled for May 16–20, 1988 in Buenos Aires. The scientific program will emphasize the recent advances in the diverse fields of the physiological sciences. This meeting has a special significance, since at this time we will celebrate the 100th anniversary of the birth of Professor Bernard A. Houssay. This brilliant teacher, together with E. Braun Menendez, V. G. Foglia, E. Huidobro, W. Buno, E. Migliaro, and R. Caldeyro Barcia founded the ALACF in 1956. This meeting is in homage to the founders and a commitment to work for a promising future. *Information:* XVI Congress ALACF, Sarmiento 1562, 4°E (1042), Buenos Aires, Argentina.