



## EDITORIAL

### Initiation of Our Second Century

Institutions like the American Physiological Society go through cycles of change and consolidation. Both processes are necessary for the health of the institution and seem to have lives of their own. The leaders of the Society of a particular time are analogous to the sweepers in a curling match. The momentum of the Society provided by its active members determines the major direction; the leaders can, by working furiously, make small differences in the path taken.

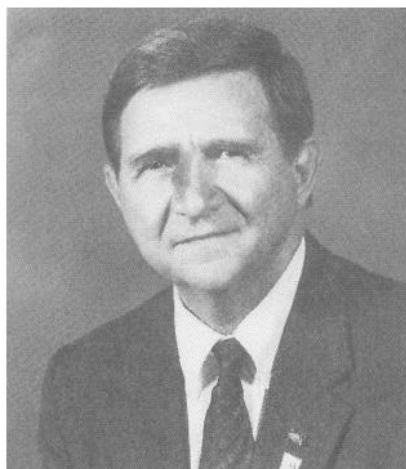
Even if the leaders have only a small role in the overall direction of the Society, they are in a good position to watch the action. I have been privileged to serve APS as a member of its Council and as its President during one of its periods of rapid change, and from this perspective I would like to report to you on some of our new directions.

#### Governance

At the 1987 Spring Meeting, we made major changes in our governance system. There were two prime motivations for these changes. First, many were concerned that the nominating system for officers of the Society did not result in a broad enough representation of the interests of its members. The representation of cardiovascular and respiratory physiologists on Council seemed out of proportion to their numbers in the Society. At a time of rapid change in biomedical science, there was reason to think that we should increase the likelihood that members representing relatively small but emerging and important

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### Sixty-First President of APS Aubrey E. Taylor



Aubrey E. Taylor will become the 61st president of the American Physiological Society on July 1, succeeding Harvey V. Sparks, Jr.

His election to the presidency of the 6,600-member society climaxes an active 20-year membership for Taylor, who has served on APS editorial boards, committees, and the Council, where he was actively involved in the restructuring of the Society into a sectional-based organization.

Currently he has been taking an active role in promoting strategies to protect the scientists from the resurgent antivivisectionist movement to bar the use of experimental animals and in the revitalization and restructuring of the Society's program activities.

"The major problem facing our Society is its self-image," Taylor said in a recent interview. "Even with prosperous and growing scientific publications and meetings, with more funding than ever before of physiology department members by the National Institutes of Health, and a growing number of job opportunities for well-

trained physiologists, there are some members of our Society who have reacted negatively to the emergence of the so-called 'new biology' without considering that physiology is the likely future home for many of those who are trained in these new techniques.

"The discipline of physiology stands on the threshold of new greatness and our Society has both the membership and strength to lead the biological sciences into the twenty-first century and beyond."

Taylor cautioned, however, that "before this can occur physiologists must be able to convey to the members of the cell biology community our research questions that have accumulated over the past decades and, in turn, be receptive to their new techniques and philosophies. Such dialogues can only strengthen our research programs."

In his assessment of physiological research programs, Taylor said, "A vast new array of experimental techniques seeks new research areas for application and we must grasp this opportunity. But we also must not overlook the fact that many important areas of physiological research now rely on multiorgan experimental models which have not yet progressed to a level requiring immediate incorporation of the new biological techniques, such as gene sequencing, into their research programs."

Taylor noted also that other areas of physiological research, such as membrane transport, are more receptive to these cell biology techniques. For example, he said that Dr. Ernie Wright recently has cloned the Na<sup>+</sup>-glucose cotransport system.

"Those of us working at the organ level must realize that the new biology will be

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subdisciplines should have the opportunity to lead.

Second, we needed to recognize the increasing usefulness of subdisciplinary Sections within the Society. Many of us find that our research interests are well served by groups organized around an organ system or particular function of living organisms. The Publication Program of the APS had recognized this in 1977 when the *American Journal of Physiology* was sectionalized. It is time to extend this concept to other activities of the Society, especially scientific programs. A first step in this process is to foster the development of strong sections that can take an increasing role both in governance and in the development of scientific programs.

With the help of the Long-Range Planning Committee and the Section Advisory Committee, Council has devised the new governance plan. We now have six instead of four councillors and they serve three instead of four year terms. A nominating committee made up of representatives of the sections selects the slate so as to balance scientific interests and institutional affiliation of members of Council. The result of the first election is encouraging. Our new members have primary interests in renal, cardiovascular, respiratory, and neurophysiology. We expect that the new members of Council will give us fresh approaches to meeting the needs of our members.

Now that the new governance system is in effect, we plan to continue our efforts to strengthen the Sections. We expect that they will be making new initiatives in scientific programming of the current Fall and Spring Meetings and also consider

pathways that may take them outside the formats of these two meetings.

## Scientific Programs

I have already mentioned that the changes in governance are expected to have an effect on our programs. In the meantime our Program Committees, chaired by Carl Gisolfi, have already been working hard on ways to make the meetings more useful to our members.

We have introduced a number of changes in the Fall Meeting. We did this because the Fall Meeting was no longer drawing a broad cross-section of physiologists. Council has asked the Program Committees to devise a theme for each Fall Meeting, with the idea that each meeting will serve varying sample of members, depending on the theme. Because Council does not wish to discourage groups that have traditionally used the Fall Meeting, free communications will continue to be accepted in areas unrelated to the theme. We have also responded to the membership's wish for practical workshops designed to bring them up-to-date on the methods of cellular and molecular biology. The first workshop on molecular biology, organized by Shu Chien and Jay Gargus, was an enormous success. Another is planned for the meeting in Montreal in October.

This is only the beginning. We have recently written to all members challenging them to develop new formats for sessions at both the Fall and Spring Meetings. There have been some enthusiastic responses, and we hope to see a number of innovative programming ideas tried at the 1989 Spring Meeting. The Sections are a key ingredient in the formula for change. We plan to rely on them to be sure that physiologists of all subdisciplines are being served by our meetings, Fall, Spring, or yet to be invented!

## Publications

Our publications program has been the pride and the strength of the Society for many years. A great deal of credit for the quality of the program goes to our former Publications Manager, Stephen Geiger, who died approximately a year ago. Council recently became concerned about the cost of our book publishing program. APS has always been ready to take on publishing efforts that were not money makers, but we wanted the overall book program to generate funds that could be invested in new ventures so as to increase our service to the physiological community. Council and the Publications Committee, chaired

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useful in broadening our understanding of the complex systems we now study—a changing of our razor, so to speak, to a more 'cutting edge.' But we also must be both willing and able, which may require some training, to incorporate new techniques into our own research programs whenever the use of such techniques are clearly beneficial to our individual research programs.

"There is no doubt that those trained in the newer forms of cell biology will be welcomed into physiology departments and that those departments will be a much stronger discipline for having done so, similar to the way biophysicists and bioengineers moved into and enriched our discipline."

Taylor believes physiologists should be elated by what is happening in the biological sciences and that there is no need to build unnecessary fences or become alarmed by unfounded fears when a physiology department appoints a cell physiologist as its chairman. The appointment of these scientists to physiology chairs is meant to strengthen physiology as a discipline and not to create a weakened or negative image of physiology.

"To equate physiology to gross anatomy, as some have done, is ridiculous since sound physiological questions can still be adequately answered at the organ and whole-animal levels," Taylor said. "I don't think physiologists have yet found all of the body's bones and insertions using classical techniques! It must be obvious to everyone that the final testing ground for all cell culture studies, gene sequencing, etc., will be in the organ of interest."

A case in point cited by Taylor is the rapidly expanding field of endothelial cell culture studies, which has elevated the physiologist working in intact capillaries to the final arbitrator for deciding the applicability of these cell culture studies to the real world.

In his vision of the future Taylor said:

"Physiology society members should stand up and say: 'We have had enough from our colleagues of this negative reaction toward the new biology, and vice-versa.'"

"We must incorporate new techniques when they are necessary to answer our research questions. But if the techniques which we are presently using can also answer our questions in a sound scientific fashion, then we should continue to do our research as it is now being done with an eye on the future."

"We must define modern physiology in the terms of the questions we are now

pursuing in our research programs and not define modern physiology in terms of only newly developed techniques that may or may not be applicable at the present time to our research programs. In other words, let's not chase ambulances unless we need hospitalization!"

In looking toward his year as president of the American Physiological Society Taylor said, "Physiology is presently in excellent health, both as a Society and as a discipline. But the perception of the future of physiology as a discipline is simply horrible and something must be done about it now!"

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### "The discipline of physiology stands on the threshold of new greatness . . ."

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"During my tenure as president I plan to visit many of the departments of physiology and discuss with you, your students, and, hopefully, your deans about this critical issue and how we can begin to

- "provide more funding for training future physiologists;
- "develop a more offensive stance rather than a reactionary approach in dealing with animal activists;
- "develop better teaching methods to ensure the best possible training for both medical and graduate students;
- "devise more effective recruiting strategies at all levels of training; and
- "elevate the perception of physiology as a vigorous and growing discipline."

"Physiology is alive and well in the USA, Canada, and the rest of the world and I hope during the coming year we will have the opportunity to discuss these important issues in constructive and forth right fashions."

Taylor's vision of where physiology stands today and where it should be standing in the years ahead can be traced by his career pattern that began in Texas and has led him to his present position as chairman of the Department of Physiology at the University of South Alabama's School of Medicine.

Aubrey Elmo Taylor, 55, was born in El Paso and grew up in Bryson, Texas, Ventura and Oxnard, California, and Fort Worth, where he was graduated from Paschal High School, a school popularized by novelist Dan Jenkins. After a hitch in the U.S. Army and brief employment with the meat processor Swift & Company, Taylor enrolled at Texas Christian University

where in 1960 he received a baccalaureate degree with a double major of mathematics and psychology.

Taylor enrolled in the graduate program at Arthur C. Guyton's physiology department at the University of Mississippi Medical School, where in 1966 he earned his Ph.D. His postdoctoral research was in membrane transport and nonequilibrium thermodynamics at A.K. Solomon's Biophysical Laboratory at Harvard University under the guidance of Peter Curran, Ernie Wright, and Stanley Schultz.

In 1967 he returned to Mississippi as an associate professor of physiology and was appointed professor of physiology and anesthesiology in 1973. It was here that he started encouraging young clinicians to use his laboratory to train in basic research, a tradition that he has continued.

While at Mississippi Taylor developed an interest in both medical and graduate education and served on the medical school admissions board for 10 years and as the director of the physiology department's graduate school program. He also taught undergraduate mathematics at the University's extension center in Jackson. In 1977 Taylor moved to his current position.

Taylor's research spans several areas of cardiopulmonary physiology, beginning with his first concerns with the stability of the cerebral ischemic reflex involving control theory approaches, such as Bodie and Nyquist plots, to his more recent studies conducted on the mechanisms of capillary transport of solutes and water in the microcirculation of lung, gastrointestinal tract, skeletal muscle, and subcutaneous tissue. His studies also have focused on oxygen radical involvement in various forms of lung and brain pathology and how the lung's vascular resistance changes in various forms of pulmonary vascular disease.

Although Taylor's research spans several different physiological areas from intestinal epithelial transport to capillary exchange of solutes and solutes, his studies all stem from his earlier work in Guyton's laboratory concerning how the various forces acting across the capillary wall interact in normal capillary function to prevent the formation of edema and how their delicate balance is altered in various diseased states.

Taylor has trained more than 40 Ph.D.s and has had more than 15 postdoctoral students working in his laboratory. He also has trained several clinical research fellows. Taylor is the author of more than 450 publications and has written four books. He currently is the associate editor of the Society's *Journal of Applied Physiology*.

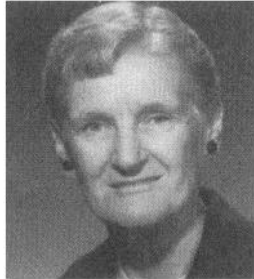
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## APS Election Results

**Vernon S. Bishop**, Professor of Cardiovascular Pharmacology, University of Texas Health Science Center, San Antonio, will become President-Elect July 1. The four newly elected Councillors (terms in parentheses) are **Beverly Bishop**, Professor of Physiology, State University of New York at Buffalo (1988-91); **Allen W. Cowley, Jr.**, Chairman, Department of Physiology, Medical College of Wisconsin, Milwaukee (1988-89); **Gerhard Giebish**, Sterling Professor of Physiology and Chairman, Yale University Medical School, New Haven (1988-90); and **Peter D. Wagner**, Professor of Medicine, Department of Medicine, University of California San Diego, La Jolla (1988-91).



Vernon S. Bishop



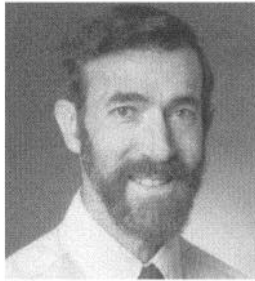
Beverly Bishop



Allen W. Cowley, Jr.



Gerhard Giebish



Peter D. Wagner

### TAYLOR

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In recognition of his work as a researcher and educator, Taylor has been awarded many professional honors, the most recent being the Landis Award from the Microcirculatory Society in 1985 and the Wiggers Award from the APS Cardiovascular Section in 1987. The American Lymphology Society has selected Taylor to be its first recipient of the Cecil Drinker Award, and the cardiopulmonary section of the American Hospital Association has selected him for the Dickinson Richards Award. Both awards are to be presented in the fall. He also was recently presented with a National Heart, Lung, and Blood Institute's Merit Award for the 21st year of his grant, "Transport Across the Alveolar-Capillary Membrane."

In addition to his work for the Society—

which includes four years on the APS Council, the chairman of the membership committee, and program representative for the respiration section—Taylor also has been active with the American Heart Association and its regional and state affiliates, committees and study sections of the National Institutes of Health, served as president of the Microcirculatory Society, and is a member of both the International and USA lymphology societies, the American Association for the Advancement of Science, and the academies of science in Alabama, Mississippi, and New York.

Taylor is married to the former Jane Davis of Fort Worth, and they have three daughters and four grandchildren. His parents, Mr. and Mrs. V. T. Taylor, live in Riveroaks, Texas. ☞

The American Physiological Society has established the Stephen R. Geiger Memorial Fund for awards to pre- and postdoctoral physiologists to purchase APS books and journals. Tax-deductible contributions may be sent to the APS-Stephen R. Geiger Memorial Fund.

## Ford Withdraws Pet Protection Act; Bill Still Alive in House

Sen. Wendell Ford (D-KY) has withdrawn his so-called pet protection bill (S 1457), replacing it with a proposed amendment to the Animal Welfare Act that would require animal dealers to have proof of purchase for all random source animals sold to research and educational institutions.

The senator's action came after he received a firestorm of letters and telephone calls from the scientific community protesting the pet protection bill, which, if enacted, would have made researchers ineligible for federal funds should unclaimed pound animals be used in their research projects. Many of the letters and telephone calls reportedly came from physiologists who were responding to a letter to the APS membership from APS President Harvey V. Sparks, Jr., citing the dangers to both educators and researchers should that bill be enacted into law.

In introducing the Pet Theft Act (S 2353), Ford said "I tried to attack the problem of pet theft from another angle, that of S 1457, the Pet Protection Act, but it became embroiled in the highly controversial matter of pound seizure. Today, I separate the two issues, leaving pound seizure for some other person to deal with on some other day." The last comment has been interpreted to mean that the senator has no plans to reintroduce the pet protection bill at some later date.

Although Ford has withdrawn his pet protection bill, the House version of this bill (HR 778) continues to be pushed by its sponsor, Rep. Robert Mrazek (D-NY). The bill stands very little chance of passage by itself, but it has been indicated that it may be offered as an amendment to the NIH reauthorization bill and, thus, could win Congressional approval as a part of that package.

# A Look at the Politics of Research With Animals: Regaining Lost Perspective

Larry Horton

Associate Vice President for Public Affairs,  
Stanford University

An earnest couple from Apple Valley, Minnesota, recently wrote the following letter to the president of my University:

Dear President Kennedy,

Our literature tells us that you are giving primates cocaine and heroin until they die.

Why are you carrying on this hideous research? Does non human life have no value?

This research appears very similar to the German Death Camps during the Second World War. And it's 'OK' because primates are killed.

Please reconsider.

Most Sincerely,<sup>1</sup>

That fifty-four word text illustrates some fundamental problems with today's activism against research using animals. On one level, the facts about our research are simply wrong: we are not doing any such research at Stanford. But there is a deeper problem. The historical perspective is inverted. The Nazi reference is dead wrong for two reasons: 1) it ignores the antivivisectionist strain in Nazi philosophy and policy, and 2) it ignores the actual conclusions drawn from Nazi brutality and embodied in the postwar Nuremberg Code.

In the first year the Nazis came to power, they took decisive action on antivivisection. An early Nazi propaganda piece extolling Hitler's virtues includes this accolade:

your Fuhrer is the strongest opponent of any form of animal torment; especially vivisection, which is the 'scientific' torture of animals, and a heinous product of the jewish-materialistic school of medicine, about which he states: 'in the national-socialist state, this situation will end very soon.'<sup>2</sup>

In a 1933 press release by the Reich Press Agency of the NSDAP, the importance of the Nazi policy was proclaimed as follows:

among all civilized states, Germany is

the first country to end the shame of vivisection. The New Germany not only frees people from the curse of materialism, egotism and cultural bolshevism, but also gives rights to the tortured, tormented and, up until now, completely unprotected animals. The animal friends and opponents of vivisection in all countries will hail this act of the National Socialist government of the New Germany with a joy! . . . what Reich Chancellor Adolf Hitler, and Prime Minister Göring did and will do for the protection of animals, stands as a guideline to the leaders of all civilized states.<sup>3</sup>

We know all too well the truth about Nazi experiments on humans in the death camps. The postwar examination of what happened there resulted in the promulgation of the Nuremberg Code, which explicitly states that human experiments should be based on the results of animal experimentation.<sup>4</sup> For those with a fresh understanding of Nazi policies, animal research was not an atrocity; it was a moral obligation.

Yet what has been called the Auschwitz analogy—comparing research with animals to the holocaust—is given common currency, sometimes by members of Congress, sometimes by others. Here is an interesting twist added by Ingrid Newkirk, referred to in the *Washington Post* as the Joan of Arc of Animal Rights: "Six million people died in concentration camps, but 6 billion broiler chickens will die this year in slaughter houses."<sup>5</sup> I leave it to you to evaluate the moral content of that statement.

This distortion of the Nazi legacy is just one example of our lost perspective on the controversy over using animals in research. We have an understandable bias toward the here-and-now, but on this issue, our fixation on the present borders on social amnesia. The political opposition to the use of animals in research is not new. It has been an enduring political staple since the development of serious, systematic experimental physiology in the nineteenth century and the reactive formation of antivivisectionist organizations.

To understand our contemporary activism, one ought to look at nineteenth-cen-

tury England. It was here, after all, that antivivisection got started as a social and political movement. Several things ought to be noted.

First, two strains of opposition to using animals in research emerged at the outset of the antivivisectionist movement: 1) a moral strain that judged vivisection to be wrong, pure and simple, and 2) a practical strain that opposed vivisection, not because it was necessarily wrong but because it was bad science, unnecessary and inconclusive. To this day, these two strains continue to dominate the debate, but they are often so intertwined that the distinction is lost. The result is a contemporary movement fundamentally grounded in moral opposition but regularly justifying its policies on practical criticisms of science itself.

Second, from the outset, antivivisectionists were highly active politically. As one scholar puts it, "the movement constitutes almost a glossary of nineteenth-century methods for mobilizing and focusing public opinion on a specific issue." They were particularly skillful in exploiting single incidents of perceived ill treatment.

Third, virtually all of the essential arguments heard today were first expressed in the nineteenth century. It is not a new debate. Even the much talked about emphasis today on developing nonanimal models for research is not new. The Leigh Browne Trust was established in the mid-1890s specifically to develop methods of research "without experimentation on living animals of a nature to cause pain."<sup>6</sup> One of the first publications of this trust was described as "Dr. Carne Ross's valuable pamphlet on the use of cinnamon in the treatment of cancer and other diseases."<sup>7</sup> For whatever solace it may provide those from institutions that are now in conflict with animal right groups over building new research facilities, the most publicized confrontation between antivivisectionists and scientists in the nineteenth century involved in an attempt to prevent funding for a physiological laboratory at Oxford in 1883.

Fourth, some leading scientists of the day adopted a political course best described as prudential acquiescence. They encouraged passage of what became the

Remarks to the 1988 National Association for Biomedical Research Legislative Conference, Washington, DC, February 22, 1988.

British Cruelty to Animals Act of 1876 because they hoped it would dampen antivivisectionist activity. It did not, and many of them later regretted supporting the act.

On this side of the Atlantic, experimental physiology lagged behind that in England and Europe. With the rise of experimental biological science in America in the 1890s came a corresponding rise in antivivisectionist sentiment. Formal antivivisectionist societies were established in Massachusetts, New York, and Illinois.<sup>8</sup>

Some conclusions can be drawn of serious attempts at antivivisectionist legislation in the late nineteenth and early twentieth centuries in America. Political conflicts over the use of animals in research were hard fought. The issues then were new and tough, and the animal advocates were every bit as persistent as those today. Antivivisectionist and seriously restrictive legislation failed for three reasons: 1) the animal activists generally misjudged the temper of general public, 2) scientists and supporters of science organized and fought back, and 3) the successes of experimental science, particularly with the discovery of methods for the prevention and treatment of diphtheria, shored up the credibility of scientists while eroding that of the critics.

These historical snippets show that we are not facing fundamentally new issues, merely variants of well-worn fundamental themes.

But beware: looking backward at controversies, whose outcomes we know, can be deceptive. One ought not to assume that it was any easier to be politically effective on laboratory animal issues then than it is today. Indeed, I suspect it was much harder.

The current activism on animals not only has a revealing history; it is a worldwide phenomenon.

England continues to be a hot spot for direct action. The Animal Liberation Front (ALF) is active there, and many of its leaders are in jail for criminal activities. Researchers have received death threats, and there has been at least one close call—a lethal bomb discovered under a car. Scotland Yard takes these matters very seriously and has a special squad of 20 agents working just on criminal activities connected to animal activism. In England, the ALF claims 1,300 hardline members and an additional 1,600 cash backers. Each year they do an estimated £6 million of damage.<sup>9</sup>

In Germany, the Greens have openly embraced animal rights, and the Social Democrats seem to be moving in that direction. Germany recently revised its fundamental law governing research with an-

imals, but agitation continues for more changes.

In Switzerland, there was a national referendum in December 1985 on the direct issue of whether any research with animals would be permitted within the Swiss borders. This extreme measure frightened Swiss scientists and pharmaceutical firms and provoked a spirited electoral contest. The result was that over 70% of the voters rejected antivivisection and supported research. (This situation contrasts sharply with that in the United States, where we face a hit-and-run guerilla campaign on a dozen fronts, each calling for a seemingly plausible, if unneeded, new law on a side issue. We are in no danger of upfront antivivisectionist legislation passing, but we are in serious danger of being choked by a surfeit of encumbrances. Being nibbled to death by ducks is not an improvement over being trampled by an elephant.)

The toughest and most frequent venue for government action in the last five years has been the state and local government.

In 1980, there were only 6 bills on the subject of animal research in state legislatures throughout the country. By 1983 there were 50 such bills in state legislatures, and last year 69 bills were introduced in 22 states. Just a few years ago many people thought this issue was the exclusive preserve of the weird and eccentric coastal states of Massachusetts and California. Everyone should be quite disabused of that notion by now. This is an issue with roots everywhere, and eruptions of activity can occur anywhere.

One test of the strength of a political position is a ballot proposition voted on by the people at large. The evidence shows that the biomedical community to date has a winning record. Specifically on the pound issue, we have had three direct ballots in California that I know of. In 1938, there was a spirited statewide initiative with high public visibility. The measure was overwhelmingly defeated, with 70% of the voters statewide and in every county voting NO. In June 1986, California had ballot measures that would eliminate pound animals for research purposes in one city, San Bernardino, and one county, Mendocino. The biomedical community won both measures. Elsewhere, recent solid victories in direct ballot measures in counties in Florida and Arizona have also shown that, at least so far, the biomedical community can win at the ballot box.

One might look over all the legislative activity at all levels and conclude that, though many bills have been introduced, relatively few that have adversely affected research have passed. Looking at the bal-

ance sheet of outcomes, one could conclude that, on the whole, the biomedical community has done reasonably well so far.

Yet the results must be examined more closely. Virtually all of the successes of the biomedical community have merely staved off assaults. Our work is almost wholly defensive. Each victory preserves the status quo, but each loss to the biomedical community is a real one. A situation of 10 victories and 1 loss, therefore, would still be a net loss. This is not an encouraging position to be in, and there is no sign of immediate relief. Indeed, much activity has recently been directed at local government, particularly at processes that approve new facilities. All levels of government will continue to be fertile ground for activism on the laboratory animal issue.

One cannot consider the politics of a given issue without some attention to the groups driving the issue. What are the characteristics of contemporary animal protectionist activism? We are repeatedly told that there is a wide range of organizations and opinions, hundreds of them, ranging from moderate reformers interested in clean cages and strict enforcement of existing policies to animal rights groups who fundamentally oppose research on animals to animal liberationists who are committed to use violence and terrorism to stop research.

Yet, the most important single fact to those working in the front lines of legislation is that moderates from the animal welfare movement have not been much in evidence. What we have seen in California is that those who profess moderation often support the same legislation as out-and-out antivivisectionists. Most of the voices speaking out sound surprisingly similar. There is no question about the sophistication of many wholly committed antivivisectionists: they are shrewd and effective; they are willing to take small steps, one at a time, while never losing sight of their ultimate objective of eliminating research using animals.

A reexamination is in order, I believe, of the role played by groups long thought to be moderate. I personally cannot place the Humane Society of the United States in the moderate camp, and its former national spokesman on research openly professed that the Humane Society is much closer to the animal rights position than many people think and is drawing even closer.<sup>10</sup>

As you reevaluate the position of groups that have been thought to be moderate, look carefully at changes in your local organizations. Just a few miles north of Stan-

ford, the Peninsula Humane Society, which was rated by the Mobilization for Animals as the 13th wealthiest animal organization in the country with a fund balance of \$2.7 million,<sup>11</sup> was taken over by what newspapers called "a coup" within the board of directors.<sup>12</sup> Closer to my home, the Palo Alto Humane Society erupted this summer into aggressive opposition to the construction of new science facilities at Stanford, which has resulted in a temporary blocking of local government permits and increased costs of at least \$2 million. In Canada, the Toronto Humane Society has been taken over by animal rights activists.<sup>13</sup> The long-range implications of this new phenomenon are not yet known.

Let me turn to public perceptions that contribute to the political environment. The biomedical community suffers seriously, I believe, from a predicament that is often not explicitly recognized. The controversy over animals and research is seen as a sharp two-sided issue, with staunch antagonists at both extremes, yet one extreme is amputated. No one on the biomedical side represents an extreme position. I suppose that an extremist on the biomedical side would be someone who would defend willful mistreatment of animals or who would believe in the divine right of scientists to do whatever they wish to animals without any kind of regulation. In the absence of any genuine extremists, however, it seems that any biomedical scientist will do. Journalists covering a story too often will talk to representatives of the People for the Ethical Treatment of Animals (PETA) or the ALF on the one hand and a distinguished biomedical scientist on the other. Our deeply ingrained values tell us to eschew extremes and search for the truth in the middle, to search for a moderate solution between the two extremes.

Yet, the plain truth is that the biomedical community is overwhelmingly moderate, truly and responsibly moderate. The biomedical community advocates and accepts all the tenets that are urged by moderate spokesmen: preference for the use of nonanimal models whenever possible, minimization of pain and suffering, regulation and inspection by qualified officials, and participation by lay persons on animal care committees. Yet, given the absence of genuine extremists, biomedical scientists are at one end of the spectrum of those who speak out on the issue. If a Nobel Laureate is at one extreme and a member of the ALF is at another extreme, who occupies the middle? Humane Societies and other so-called moderate critics are—even though they may not be moderate, informed, or

responsible.

The inevitable pressure to find the truth in the middle, to reach an accommodation between the two extremes, therefore results in the steady drift away from true moderation. This creates a serious problem for the biomedical community. Our political system places an extraordinary premium on moderation. Strident advocates seldom achieve direct success, though they often set up conditions that enable moderates, or those thought of as moderates, to make change. To arrest this drift, the biomedical community must establish its credentials as true pillars of moderation.

What about resources? Who is spending money on what? Animal activists try to palm themselves off as David going up against Goliath, but in direct political action and education, the roles are actually reversed. In 1986, PETA—an out-and-out antivivisectionist organization and the mouthpiece for the violence of the ALF—spent \$2.3 million; the combined expenditures of the only two national organizations dedicated to working on the animal research issue—the National Association for Biomedical Research and the Foundation for Biomedical Research—were less than \$1 million. Note that PETA is but a single organization in a small army of groups that are working to curb or eliminate animal research. Where does all this leave us? Here are some suggested general guidelines for effective political action.

1. Understand the nature of the opposition. You have to know what groups are active and what their interests are. Beware of false moderates. Don't waste your time trying to convert the already committed. The wildest ones do themselves more harm than they do to you. Recall the performance of Stephen Coleridge, a promi-

nent antivivisectionist, in a libel suit against him in 1903. Here is the wonderfully dry way the *London Times* described Coleridge on the stand: "The defendant when placed in the witness box did as much damage to his case as the time at his disposal for the purpose would allow."<sup>14</sup> Coleridge lost and had to pay 2,000 pounds to a libeled scientist.

2. Understand the historical context. If you believe, as many animal rights people do, that animal rights is an idea whose time has come, that its supporters are the inheritors of the great tradition of those who fought against slavery and child labor, that the movement is morally equivalent to civil rights and women's rights, then you may be excused for diving for the bunkers, knocking over the frail and infirm on the way. If, on the other hand, you believe that this is not a new movement, that it possesses neither the moral high ground nor impressive bloodlines, that it is a direct descendant of often discredited and rejected notions, and that what we really have before us is merely one more iteration of an old, old battle, and a pretty tired one at that—it's just that we've forgotten about it—then you would behave quite differently. You would, as your predecessors have done, take off your laboratory apron, or step away from your computer terminal, and go into the public to drive error from the field by an unremitting application of the truth. I emphasize: how you approach this issue historically is not peripheral but central to the public debate.

3. Get yourself in order. Make sure that you have listened to the critics and that you have your programs in order. Explain your position from a base of confidence. Above all: if you cannot clearly and compellingly tell laymen what you do and how you do it and why you do it, you will not

## Future Meetings

|                              |   |
|------------------------------|---|
| 1988                         |   |
| 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       |

be successful politically in the long run.

4. Make sure at your institutions that you have a balanced team: that you have scientists, public affairs officers, the president, deans, and the faculty working together. Any one of those parts working out of phase will reduce your overall effectiveness.

5. Take public education on this issue seriously. Universities should be in the job of education—public education too. We cannot long endure with an ill-informed, scientifically illiterate public. And on issues related to laboratory animals, there are groups aggressively purveying misinformation and half-truths. If we fail to educate each generation and provide a lot of on-going remedial education to some I am not sure that we will be very successful in the legislatures.

6. Political action must be organized and energetically pursued. But three important facts should be recognized. First, politics rests fundamentally on substance, not on fashion or temporary influence. Second, coalitions are everything in politics; single institutions can accomplish little by themselves. Third, compromise is an essential tool in politics, but it must be based on honest agreement. Without honest agreement, giving in merely to avoid unpleasantness is not compromise; it is just the beginning of the next round of conflict, with you at a disadvantage at the outset.

One thing is certain: the uses of animals in biomedical research will continue to be a staple item of controversy in at least some portion of the public mind. From time to time, this controversy will find political expression. How that political expression works itself out will depend on things done and said by the participants in the controversy. Spectators will not determine the outcome; players will. I hope all of us in this room will be players.

## Endnotes

<sup>1</sup> Letter to Donald Kennedy, President of Stanford University, dated September 28, 1987.

<sup>2</sup> Wutke-Groneberg, Walter: *Medizin im Nationalsozialismus ein Arbeitsbuch* (Schwäbische Verlagsgesellschaft, 1982), p. 81.

<sup>3</sup> Wutke-Groneberg: *Medizin im Nationalsozialismus ein Arbeitsbuch*, p. 321. See also, Herman Göring: "A Broadcast Over the German Radio Network Describing the Fight Against Vivisection and Measures Taken to Prohibit It, 28 August 1933." In: *The Political Testament of Herman Göring*, translated by H. W. Blood-Ryan. London, 1939, p. 70-75.

<sup>4</sup> *Trials of War Criminals Before the Nuremberg Military Tribunals Under Control Council Law No. 10*. Washington, DC: US Government Printing Office, 1949, Vol. 2, p. 181-182.

<sup>5</sup> Brown, Chip: "She's a Portrait of Zealotry in Plastic Shoes," *Washington Post*, November 13, 1983, p. 31.

<sup>6</sup> French, Richard D: *Antivivisection and Medical Science in Victorian Society*, p. 277.

## APS President Tells NIH of Physiologists' Research Concerns

I am Harvey Sparks, President of the American Physiological Society and Professor and Chairman of the Department of Physiology at Michigan State University. The American Physiological Society, comprised of 6,600 members, has had a long and productive relationship with the National Institutes of Health based on our mutual mission of fostering biomedical research and improving human health. I appreciate the opportunity to share some of my thoughts on the crucial issues facing NIH and the biomedical community at this time. I would like to comment first on the potentially negative effects of legislation and regulation directed against the use of animals in research. Bills HR-778 and S-1457, called the Pet Protection Act, introduced by Representative Mrazak and Senator Ford, would deny NIH funds to anyone using pound animals. It effectively limits NIH supported researchers to the use of purpose-bred animals.

The APS strongly opposes this bill for the following reasons.

1. Random source animals, especially cats and dogs, have served us well, contributing to advances in many fields of biomedicine for many years. There is no reason to believe that they will be of any less help to us in the future. As biomedical scientists begin to apply the fruits of biotechnology, the use of whole animals with intact and interacting systems will be a necessary step in understanding the usefulness and estimating the safety of new products.

Furthermore, many of the most pressing research problems have to do with how a system, for example, the nervous or cardiovascular system, works. It seems almost inevitable that solving the problems like

Alzheimer's disease and high blood pressure will involve both probing the molecular basis of the disease and returning to test our new found ideas in intact organ systems. Our past successes in the use of cats for studies of the nervous system and dogs for the study of the cardiovascular system indicate that random source animals will continue to be useful in the future.

2. Pound animals are cheaper than purpose-bred animals by a factor of 10. This means that more experiments can be done for the same money. Given a fixed, overall expenditure for health research, paying less for individual experiments hastens the advance of knowledge, thereby decreasing pain and suffering of humans and animals who are afflicted with diseases. APS members hope that NIH will do all it can to educate legislators of the true cost of new laws such as the Pet Protection Act. At a time of fiscal austerity, the price of these laws will be lost opportunities to alleviate human suffering.

The APS is also concerned about HR-1708, the Research Accountability Act introduced by Representative Toricelli. The Act states that all federal grant proposals involving the use of live animals must be submitted to a center for assurance that the proposed research would not be repetitive. The APS strongly opposes this bill because adequate protection against repetitive research already exists in the form of peer review and computerized citation systems. We think that there is almost no chance of inadvertent repetitive research funded by federal grants. The large amount of money which would be spent to implement the Research Accountability Act could be more usefully spent on research programs which would result in a decrease of pain and suffering.

I would also like to comment on an unfortunate tendency in the application of new laws concerning animal use. We think that NIH and other voluntary and governmental agencies sometimes go beyond the 1985 amendments to the Animal Welfare Act in writing regulations regarding animal use. We share the sentiment that animal welfare is an important consideration; however, it is important to recognize that unnecessarily restrictive interpretations of the Animal Welfare Act are destructive be-

Testimony given at the National Institutes of Health hearing held in Chicago, March 24, 1988.

cause every new restriction, no matter how subtle, raises the cost of doing research, and in the zero sum game of biomedical research funding, this lowers the amount of research that is done. Again, society pays the price of unnecessary regulation in the unrelieved pain and suffering caused by slower advances of knowledge.

The American Physiological Society hopes that NIH will take the position that promulgation of unnecessary regulations regarding animal welfare is too expensive to be condoned.

Now I would like to turn briefly to three issues regarding funding of research and research training.

1. The APS strongly supports the concept of a fixed, predictable number of grants each year. The genius of the partnership between NIH and universities of this country lies primarily in the emphasis on investigator-initiated research grants and peer review. This system has made the United States a premier country in biomedical research, an important consideration for our nation's competitiveness and economic growth. The APS is pleased with plans to support 6,100 grants in fiscal 1988 and agrees with the Ad Hoc Group for Biomedical Research Funding that we should aim for 7,400 new and competing grants in fiscal 1989. This increase is needed to be sure that we are funding a sufficient number of grants to include most of the good ideas which have come forth from the research community. It has been proven over and over again that we do not necessarily know the path to the knowledge we will need 10 years from now. Our only insurance is to fund a reasonable fraction of the good ideas presented to NIH regardless of their current relevance.

I think that most scientists who have served on peer review committees agree when funding is limited to between 20 and 30 percent of approved applications, there is a good chance that an important idea which is not in the current mainstream will not achieve funding status. I think that most of us find the current funding trend disturbing because the possibility exists that that we are not supporting important work which might make all the difference in a few years.

2. My next point concerning research funding is the need for construction of research facilities. I have first-hand knowledge of this problem because my department happens to be housed in an old building, and it has been necessary to find millions of dollars to keep it in good enough shape to allow us to do our research. As our methods become more demanding, more renovation will be needed. This piecemeal renovation process is ex-

pensive and never totally satisfactory. In general, half of our nation's research facilities are more than 25 years old, and a quarter of them were built before World War II. To keep our nation's premier position in biomedical research, new facilities must be built in many areas of the country. The APS believes that funding for new facilities should not be taken from dollars which would otherwise be used to support research projects for the reasons I have discussed earlier. Good work is already going begging for funds.

The APS takes the view that the nation's capital investment in research will pay dividends for many years in the improved health of our citizens and the nation's continued preeminence in the commercial aspects of biomedical science.

3. Finally, we must consider the source of the next generation of scientists. The people trained in the early seventies are now the mid-career scientists ready to take on the challenge of old problems, for example, cancer and heart disease, and new problems, for example, AIDS. These vigorous, well-trained individuals will be key to the progress made over the next decade. Does it not make sense to plan on an adequate supply of mid-career scientists for the year 2000? Is there anyone who thinks there will be no more health problems to be solved? Most of us who have been involved in the peer review process know that there are outstanding training programs in the nation's universities which go unfunded every year. Others caught in the stop-start funding, which is characteristic of recent years, lose momentum and do not live up to their potential. Furthermore, it is important to be sure that stipends for MD trainees are high enough to match house staff salaries. These trainees are often in debt already and cannot go further in debt at this stage of their training.

Adequate investment in the next gen-

eration of scientists is the most important priority decision that NIH can make.

There is one more point concerning training programs. Members of the APS are excited by the opportunity to apply the techniques of molecular biology to disease and believe that recent RFAs from NIH emphasizing this area are appropriate. However, NIH should not neglect support of trainees who will have a knowledge of both molecular and cellular techniques and an orientation toward the solution of problems at the integrative or systems level. As I indicated earlier, many of our most pressing problems are likely to yield to a joint effort at molecular, cellular, and systems levels. The American Physiological Society wants to be sure that in the year 2000 there are young, aggressive scientists capable of doing work on the systems level. To achieve this goal, we will need continued support of NIH for interdisciplinary training programs which cut across molecular, cellular, and systems levels of organization.

Thank you for your attention. I know that I have talked about the need to increase expenditures at a time when all sectors of government necessarily face fiscal constraint. This is why I began my remarks with our view of the need to limit the excesses of the animal activists. With the requirement to expand our health research enterprise over the coming years, it would be tragic if unnecessary laws and regulations regarding animals were forced upon us by animal activists. We really cannot afford to let that happen. The American Physiological Society stands ready to work with the National Institutes of Health to assure that the nation will benefit from the pursuit of new biomedical knowledge for many years to come. Thank you.

Harvey V. Sparks, Jr.

## BOOKS RECEIVED

*Pediatric and Adolescent Endocrinology*. Z. Laron (Series Editor). Vol. 17: *Early Vascular Complications in Children with Diabetes Mellitus*. B. Weber (Editor). Basel: Karger, 1988, 284 pp., illus., index, \$142.75.

*Physiology* (2nd ed.). R. M. Berne and M. N. Levy (Editors). St. Louis, MO: Mosby, 1988, 1077 pp., illus., index, \$49.95.

*Frontiers of Hormone Research*. T. B. van Wimersma Greidanus (Series Editor). Vol. 16: *Gut Regulatory Peptides: Their Role in Health and Disease*. E. Blazquez (Editor). Basel: Karger, 1987, 234 pp., illus., index, \$123.50.

*Ion Transport in Prokaryotes*. B. P. Rosen

and S. Silver (Editors). San Diego, CA: Academic, 1987, 332 pp., illus., index, \$85.00.

*Neurobiology Molluscan Models*. H. H. Boer, W. P. M. Geraerts, and J. Joosse (Editors). New York: North-Holland, 1987, 376 pp., illus., index, \$59.00.

*Fundamentals of Endocrinology*. W. Roy Slaunwhite, Jr. New York: Dekker, 1988, 422 pp., illus., index, \$45.00.

*Cellular and Molecular Basis of Cystic Fibrosis*. Gianni Mastella and Paul M. Quinton (Editors). San Francisco, CA: San Francisco Press, 1987 pp., illus., index, \$40.00.

*The Physiology Coloring Book*. Wynn Kapit, Robert I. Macey, and Esmail Meisami. New York: Harper & Row, 1987, 168 pp., illus., index, \$11.95.

## Preview—1988 Fall Meeting Symposia Montreal, Canada

### SYMPOSIA

#### Renal Growth and Development

Chair: M. Bergeron

Participants: A. D. Avner, E. Delaval, S. Segal, R. Chesney, and J. Robillard

#### The Development of Motor Control

Chair: C. E. Chapman

Participants: T. Cabana, A. P. Arnold, A. Bekoff, and H. Forssberg

This symposium will consider the mechanisms—anatomical, neural and hormonal—that underlie the development of motor control. Particular attention will be paid to the development of motor pathways and the associated neural circuitry. The maturation of motor behavior will be described, drawing from experiments performed both in animal models and in human infants.

#### Oxygen Stress and Aging

Chair: R. Cutler

Participants: M. Simic, E. R. Stadtman, A. Balin, R. A. Floyd, and R. G. Cutler

This symposium will present a general overview and recent advances as to the possible role active oxygen species (free radicals, peroxides, aldehydes) and related natural defense systems may have to the aging process. The program is designed to begin with basic physical, chemical, and biochemical mechanisms of free radical-mediated reactions and to then proceed to relation of active oxygen species to proteins and nucleic acids. The role of oxygen radicals to cellular function will be presented, as will the exciting new work mapping out specific areas in the brain of oxidative damage. The final paper will summarize these and other results as to the possible importance of oxyradicals to human aging and the relative importance of antioxidants as antiaging mechanisms.

#### Cellular Mechanisms in the Development of Respiratory Control

Chair: J. P. Farber

Participants: D. W. Richter, E. E. Lawson, T. Trippenbach, S. Ioffe, and G. G. Haddad

This symposium will summarize recent experience using electrophysiological and related techniques to evaluate cellular mechanisms in the maturation of respiratory control. Control of breathing in newborns clearly differs from adults in terms

of breathing pattern as well as respiratory reflex responses; it can be hypothesized that differences in overall maturation of the nervous system and/or specific adaptations of the neonate are responsible for these developmental changes. Speakers will discuss results using single unit intracellular and extracellular neural recordings in the intact nervous system as well as the medulla in vitro. The ionic environment of cells will also be considered. Single-cell techniques have only recently been used to investigate neural maturation affecting respiratory control. We hope to discuss the potential role of these research tools in further investigations. More broadly, the factors underlying maturation of breathing provide good examples of early integrative properties of the nervous system; for this reason this session should be attractive to many individuals with interest in nervous system development.

#### Changes in Receptor Responses and Neurotransmitters with Age

Chair: C. Finch

Participants: J. H. Morrison, D. G. Morgan, F. Mora, T. Collier, B. Weiss, E. London, H. A. Baghdoyan, and K. E. Moore

The morning session will begin with a discussion of the anatomic organization of the monoamine and neuropeptide systems in primate neocortex. Recent immunohistochemical analyses of the catecholamine-, serotonin-, and acetylcholine-containing afferents to neocortex, as well as several intrinsic peptide-containing neurons, have provided a more complete analysis of the neurotransmitter-specific circuitry of the neocortex. Degenerative changes in these systems and in specific receptors that occur with aging and Alzheimer's disease will be discussed. Studies illustrating the reversal of age-related transmitter dysfunctions by neural transplants will also be presented. Grafts of fetal locus coeruleus neurons into the ventricles or cortex of aged, memory-deficient rats yields improved performance of spatial memory and inhibitory avoidance tasks. The afternoon session will focus on age-related changes in mRNA of proteins associated with synaptic transmission and changes in cholinergic and dopaminergic systems. With aging, adrenergic receptor density declines and the capacity of these receptors to adapt to a changing neuronal

input or hormonal environment is reduced.

#### Thermoregulation: Development and Decline With Age

Chair: B. A. Horwitz and D. Robertshaw

Participants: M. Kluger, R. McDonald, J. S. Stein, and R. D. Myers

As animals (including humans) age, their ability to respond to thermal stress first improves and then declines. The neonate and the elderly are particularly susceptible to adverse thermal environments. This symposium will review current research related to the physiological mechanisms underlying these changes, with a major focus on the decline of thermal homeostatic mechanisms with age and factors (e.g., physical activity) that may attenuate this decline. All of the presentors in the symposium are actively engaged in various aspects of physiological research dealing with aging. The information considered in the symposium is important not only in its own right but also because it pertains to a homeostatic system that could serve as a model for understanding factors that modulate age-related changes in autonomic function.

#### Intestinal Growth and Development

Chair: O. Koldovsky

Participants: R. K. Montgomery, P. Hahn, C. Malo, and D. Menard

During the past decade, progress was achieved in our understanding the development of gastrointestinal functions in experimental animals and humans; recently several symposia have dealt with this subject. This symposium addresses several new, important, and emerging studies, namely, the interaction of the developing gastrointestinal tract with hormonal substances present in milk, regulation of growth and development of the small intestine by factors of internal environment, and the evaluation of intestinal energetic metabolism during development. The first part of the discussion will deal with the use of experimental animals in studying these functions, and the second section will examine studies performed on tissues of the human small intestine. The invited speakers presenting this workshop are extremely well qualified to synthesize the present knowledge on these given subjects

and are highly capable of outlining further research goals for future study.

#### **Age-Related Changes in Excitation-Contraction Coupling Mechanisms in the Heart**

Chair: E. G. Lakatta

Participants: D. M. Bers, J. M. Jarmakani, L. Mahony, J. W. Lederer, and N. Narayanan

The main purpose of the proposed symposium will be to educate our constituents regarding new perspectives from research that focus on mechanisms of cardiac excitation-contraction and specifically on how age impacts on these mechanisms. The symposium will interface experts in biochemistry, morphology, electrophysiology, and physiology in an attempt to allow an integrated view of how changes in sarcolemmal ion transport, of sarcoplasmic reticulum development and function, and of the myofilaments interact to alter myocardial cell function. Traditionally, most cardiac physiologists have studied the heart at a single point on a broad spectrum; i.e., they have used the most accessible animal model or human volunteer, usually of just postmaturational age. The focus of the symposium will be on age-associated changes that occur not only over the first few days following birth but throughout maturation and into senescence as well. This symposium will form a continuum, e.g., a morning and afternoon session with another symposium that deals with the autonomic modulation of contractile, biochemical, and electrophysical mechanisms with aging.

#### **Ovarian Follicular Development and Regression**

Chair: P. C. K. Leung

Participants: To Be Announced

#### **Regular Exercise, Growth and Development**

Chair: D. R. Lamb

Participants: D. Sale, D. A. Cunningham, J. A. Dempsey, W. M. Sherman, and O. Bar-Or

This symposium will review recent research in selected physiological adaptations to habitual exercise that may impact growth and development. Each presenter is a well-published authority on his topic. Particular emphasis will be placed on the effects of habitual exercise on growth and development in youth and old age. Such a symposium is timely because of the current interest in increasingly more strenuous exercise regimens among increasingly younger and older age groups.

#### **Nutritional and Physiological Approaches to the Study of Aging**

Chair: R. J. M. McCarter

Participants: B. P. Yu, A. Richardson, H.

Enesco, and J. Tobin

There is growing interest in uncovering ways to retard the aging processes. This stems from both the desire to understand the primary aging processes and the practical needs of geriatric medicine. Nutritional manipulations are believed to be prime candidates in this regard, but only food restriction in rodents has clearly been shown to retard aging. It seems likely that learning the mechanisms by which food restriction retards the aging processes will provide insight into the nature of the primary aging processes as well as providing a data base for developing interventions of human aging. To this end the influence of food restriction on the rate of aging, gene expression, cellular function, and metabolic rate will be discussed as well as potential mechanisms by which these effects are produced. In addition, the highly controversial subject of the influence of fat mass on aging will be presented.

#### **Age-Related Changes in Adrenergic Control of the Cardiovascular System**

Chair: N. Narayanan

Participants: K. Rakusan, J. Roberts, I. B. Abrass, S. P. Duckles, B. B. Hoffman, and E. G. Lakatta

The major objective of this symposium is to educate our constituents regarding new perspectives from research that focuses on the impact of aging on adrenergic control of the heart and vasculature. The speakers are acknowledged experts in the area of cardiovascular aging research. They will attempt to provide an integrated view of the age-associated alterations in the adrenergic regulation of the heart and vascular functions and the mechanistic relevance of such alterations to problems of circulatory homeostasis in aging. Dr. Karel Rakusan will review age-associated morphological changes in heart and blood vessels and will describe the effects of aging on cardiovascular responses to beta adrenergic stimulation in the intact organism. Dr. Jay Roberts will focus on age-related changes in the release of norepinephrine (NE) at the cardiac neuroeffector junction in response to stimulation of cardiac sympathetic nerves; he will also address the effects of aging on the modulation of NE release by presynaptic adrenergic receptors as well as NE interactions with postsynaptic cardiac adrenoceptors. Dr. Itmar Abrass will attempt to unveil the cellular and molecular basis of age-related changes in myocardial response to adrenergic stimulation by describing the effects of aging on signal transduction by the  $\beta$ -receptor-adenylate cyclase-cyclic AMP system of the heart. The presentation by Dr. Sue Duckles will center on the effects of aging on

adrenergic neurotransmission in various vascular beds and vascular reactivity to adrenergic nerve stimulation. Dr. Brain Hoffman will focus on the effects of aging on  $\beta$ -receptor-mediated vascular smooth muscle relaxation as well as the underlying cellular and molecular mechanisms. The concluding presentation by Dr. Edward Lakatta will highlight altered  $\beta$ -adrenergic modulation of heart function with aging; perspectives drawn from studies ranging from single cells to humans will be summarized and profitable areas of future research will be identified.

#### **Angiogenic Polypeptide Growth Factors**

Chair: J. L. Swain

Participants: J. Folkman, A. Baird, M. Klagsbrun, T. Maciag, and C. Barger

Angiogenesis, the formation of new blood vessels, plays an important role in the development and functioning of organ systems. Over the past two years angiogenesis research has rapidly expanded with the molecular characterization of several polypeptide growth factors that exhibit properties consistent with a role for these factors in regulating vascular growth in vivo. Angiogenesis research now encompasses the disciplines of molecular biology, cell biology, and physiology. In addition, blood vessel growth (or lack thereof) may contribute to the pathophysiology of many diseases including cancer, ischemic heart disease, retinopathy, and arthritis. The purpose of the proposed symposium is to bring together leaders in the field of angiogenesis research to discuss the newest directions in research in this field. The participants chosen have all produced a significant portion of the work published in the area. In addition they continue to lead the field into new directions. The topic of angiogenesis recently was discussed at a two-day meeting at NIH attended by over 400 investigators and at a session of the American Heart Association National Meeting attended by over 250 investigators. These meetings illustrated the wide range of interest in the topic of angiogenesis. Since it would be difficult to cover the entire field of angiogenesis in the proposed symposium, the presentations will be primarily confined to the regulation of the production of specific angiogenic growth factors and their potential role in neovascularization. This area of angiogenesis research has generated much excitement over the last two years. In summary, angiogenesis research has rapidly expanded and may play an important role in a wide variety of areas of basic research. The timing of this symposium allows the introduction of this topic to the members of society.

## Information—1988 Fall Meeting

### ONE-HOUR LECTURE

**Behavioral Interventions for Somatic Disorders: Biofeedback and Techniques From the Deafferentation Laboratory**

Speaker: E. Taub

### SHORT-COURSE PROGRAMS

**TUTORIAL: Introduction to Molecular Biology**

Chair: S. Chien

Panel: To Be Announced

**WORKSHOP: Practicum of Molecular Biology Techniques**

Participating Companies: Beckman Instruments, Bio-Rad Laboratories, Bethesda Research Laboratories, and International Biotechnologies, Incorporated

**SYMPOSIUM: Molecular Biology for the Cardiovascular System**

Chair: S. Chien

Participants: C. P. Emerson, E. Morkin, P. C. Simpson, C. Seidman, and J. S. Riordan

### MINI-COURSE

**Tutorial Session: Introduction to Molecular Biology**

**Symposium Session: Molecular Biology of the Cardiovascular System**

**Practicum of Molecular Biology Techniques**

(A series of five hands-on workshops presented in cooperation with a number of biotech companies)

*Workshop A: DNA Isolation and Quantitation*

*Workshop B: Restriction Enzyme Digestion and Electrophoresis*

*Workshop C: Southern, Northern, and Plaque Transfers: Probe Molecules and Mapping*

*Workshop D: Sequencing DNA*

*Workshop E: Vectors*

### Tutorial Lecture

**Behavioral Interventions for Somatic Disorders: Biofeedback and Techniques From the Deafferentation Laboratory.**

### Additional Sessions

**Recent Space Flight Results in Gravitational Physiology (IUPS/CGP)**

**Current Concepts in Gravitational Physiology (IUPS/CGP)**

**Gravity and the Lung (IUPS/CGP)**

**Toxic Effects of Excitatory and Inhibitory Amino Acids on Neurological Development**

**Atrial Natriuretic Factor**

**Modern Developments in Platelet Pharmacology**

**Neuropeptides and Thermoregulation**

**Molecular Biological Approaches to the Study of Pharmacological Sciences**

**Interaction of Xenobiotics With Cytochrome P-450: Implications for the Perturbation of Heme Biosynthesis**

### SHORT COURSE ON SECOND MESSENGER SYSTEMS

Sunday, October 9

### APS PAST PRESIDENT'S ADDRESS

Tuesday, October 11

Speaker: H. V. Sparks, Jr.

### BOWDITCH LECTURE

Wednesday, October 12

**Control of Hypertrophic Versus Hyperplastic Growth of Vascular Smooth Muscle**

Speaker: G. K. Owens, University of Virginia, Charlottesville

## News From Senior Physiologists

### Letters to Roy O. Greep:

Piero D. Foa is continuing all his previously reported retirement activities (lecturing, writing, making physiological models for his grandchildren, skiing) and notes two new "developments." Stimulated by his grandchildren's questions, he has started to write a "family history." This includes orally transmitted recollections of grandfather Pio, a pathologic anatomist, who as a young postdoc worked in Virchow's laboratory, and of his father Carlo, a student of Mosso, who in 1911 published the first fetal electrocardiogram (that of Piero Foa), as well as personal recollections of growing up in Fascist Italy and escaping in 1939 with the help of an immigration visa obtained through the good offices of Harvey Cushing, Walter B. Cannon, and Jacob Fine. The second development is the publication of *Sugar Isn't*

*Always Sweet, or What is Diabetes?* (1987), the result of a long correspondence with 3rd graders who illustrated it with 52 color drawings. Proceeds will accrue to the research fund of the Michigan affiliate of the American Diabetes Association, which is distributing the book.

Thomas K. Cureton, Jr., who will be 87 years old this August, practices what he has taught. He ran the research laboratory in physical fitness at the University of Illinois from 1944 to 1969 and graduated about 60 Ph.D.s and 400 M.S. students. Today he continues to win awards for physical fitness. He holds the number 1 rating in the United States for competitive swimming for his age group. In each of three competitions in which he swam this past year he won five or six gold medals. His latest honors were the "1987 Illinois Governor's Senior Leadership Award for Health and Fitness" and the "Meritorious Service

Award of the American Physical Education Section of the Y.M.C.A.s of North America."

Harry Wong reports that he is still on the staff of the Department of Physiology of Howard University and actively engaged in teaching, supervising graduate students, and working on several funded research grants. He has been invited again by the People's Republic of China to give a series of lectures and visit research institutes this spring. To younger colleagues, he offers the advice "not to be discouraged if your grants are approved and not funded. You just have to keep applying!"

### Letter to Horace Davenport:

Nevin Scrimshaw, who recently celebrated his 70th birthday, will become emeritus from the MIT International Food and Nutrition Program in June 1988 but expects to continue his international coordinating efforts.

# Integrative Study in Physiology and Medicine APS Fall Meeting, Montreal, Canada October 11, 12, 1988

Joseph Engelberg

Department of Physiology and Biophysics, Albert B. Chandler Medical Center,  
University of Kentucky, Lexington, Kentucky

The fourth annual "Workshop on Integrative Study in Physiology and Medicine" will be held at the 1988 Fall Meeting of the American Physiological Society on Tuesday and Wednesday, October 11, 12, 1988, from 12:00 to 2:00 P.M. The workshop is organized by a group of physiologists from seven universities in the United States, Canada, and the Philippines. The focus of discussion will be the fetal and neonatal state, specifically, a medical case history describing multiple disease processes in a newborn child.

The principal purpose of these workshops is to provide a congenial atmosphere for the discussion of scientific questions free from limitations imposed by areas of specialization. Medical case histories serve as natural integrative devices since during a major illness an initial pathologic perturbation ultimately spreads its baneful influences to all parts of the organism. This transmission occurs in part via coupled feedback cycles as they maintain homeostasis. The involvement of the entire human body in disease allows medical case histories to serve as bases for discussion of phenomena from the molecular through the cellular, organ, organ-system, whole-body, and social levels.

A second purpose of these workshops is to work up medical case histories to introduce students in the health professions and graduate students to physiology at the level of the whole organism. Case histories selected for these workshops are among the most complex published in the medical literature. They are not simplified for teaching purposes. Rather, frameworks for thought are developed that enable individuals with even modest backgrounds in physiology to obtain significant insights into the physiology of the human organism and the physiologic basis of health, illness, dying, and death.

The medical case history to be discussed at the Montreal APS meeting follows.

Patient: A twenty-hour-old cyanotic infant suffering from congenital heart disease.

Source: *New England Journal of Medicine* 278: 496-504, 1968. Case 9-1968.

## Speakers:

Robert L. Vick, Baylor College of Medicine

Edith Rosenberg, Howard University College of Medicine

Andrew M. Roberts, University of Louisville School of Medicine

Sidney Solomon, University of New Mexico School of Medicine

George P. Biro, University of Ottawa  
Wayne Carley, Lamar University

Juliet Ver-Bareng, University of the East  
Ramon Magsaysay Memorial Medical Center

A twenty-hour-old male infant was admitted to the hospital because of respiratory distress and cyanosis.

The patient was the product of an uneventful forty-one-week pregnancy in a twenty-two-year-old primigravida. The vaginal delivery had been normal, and the infant weighed 8 pounds, 6 ounces. At the time of birth his color was fair, but he seemed to be in mild respiratory distress, with grunting respiration. Three hours later his color became dusky, and the respiratory distress increased. He was put into an oxygen atmosphere, with little change in his appearance until eight hours before entry, when the cyanosis deepened, and the cardiac rate rose to 200. The temperature was 102.2°F. Digoxin, 0.05 mg, penicillin, kanamycin sulfate and vitamin K were administered.

The mother and father were in good health. There was no family history of diabetes, heart disease, respiratory disease or congenital anomalies.

The patient was a cyanotic infant who appeared moribund. The respiration was gasping, with sternal and subcostal retraction. The head was normal; the fontanelles were open. The skin was dry, without loss of subcutaneous tissue; the fingernails were long. The configuration of the chest was normal; a few breath sounds were audible, and there were fine rales in both lung fields; the respiratory excursion was poor. No cardiac murmur was heard. The abdomen was soft; the edge of the liver was felt 2 cm below the right costal margin, and the spleen was pal-

pable at the left costal margin. The femoral pulses were of good quality. There was minimal response to painful stimuli.

The temperature was 97°F, the pulse 140, and the respirations 80.

The urine had a specific gravity of 1.016 and gave a ++ test for protein; the sediment contained 3 to 5 red cells per high-power field. The hematocrit was 64%, and the white-cell count 50,000, with 55% neutrophils, 7% band forms, 26% lymphocytes, 9% monocytes, 2% eosinophils and 1% basophils: there were 5 late erythroblasts and 1 normoblast per 100 white cells. The sodium was 140 mEq, and the potassium 5.5 mEq per liter. The urea nitrogen was 33 mg, and the fasting glucose 58 mg per 100 ml. A specimen of arterial blood, with the patient receiving 100% oxygen by funnel, taken via an indwelling umbilical-artery catheter, revealed that the partial pressure of oxygen was 35 mm of mercury, the partial pressure of carbon dioxide 110 mm of mercury, and the pH 6.82. An electrocardiogram demonstrated a sinus rhythm at a rate of 150, with an axis of +120°; the P waves were prominent in Leads 2, 3 and a VF; in Leads V<sub>1</sub> and V<sub>2</sub> the R waves were prominent but within normal limits for the age of the patient. X-ray films of the chest disclosed total homogeneous opacification of both lung fields with prominent air bronchograms; the diaphragmatic leaves lay at the level of the tenth ribs; the liver appeared normal in size.

Digoxin, penicillin and kanamycin sulfate were continued. A nasotracheal tube was inserted, curare was administered, and the lungs were ventilated with humidified 100% oxygen by a mechanical respirator. Culture of blood-stained material aspirated from the trachea yielded a moderate growth of klebsiella sensitive to tetracycline, chloramphenicol, streptomycin and colistin. Sodium bicarbonate was given intravenously. Four hours after entry, with the patient breathing 100% oxygen, a specimen of the arterial blood showed that the partial pressure of oxygen was 26 mm of mercury, the partial pressure of carbon dioxide 71 mm of mercury, and the pH 7.06. Two hours later a Grade 2 systolic murmur was heard along the left sternal border.

On the second hospital day the patient's color was unchanged. The murmur was audible over the back and left upper portion of the chest. The arterial partial pressure of oxygen was 36 mm of mercury, and the partial pressure of carbon dioxide 62 mm of mercury; the pH was 7.36. Meraluride, 0.1 ml, was administered, but a diuresis did not result. An x-ray film of the chest showed marked clearing of the lung fields, with a few

persistent mottled densities in the hilar regions; the heart appeared moderately enlarged; the pulmonary vascularity was not congested. The hemoglobin was 9.4 gm per 100 ml, and the hematocrit 29%; the white-cell count was 14,600, with 79% neutrophils and 6% band forms. The sodium was 143 mEq, the potassium 4.8 mEq, and the chloride 101 mEq per liter. Packed red cells, 40 ml, were given intravenously. An electrocardiogram showed a sinus rhythm at a rate of 125; the QRS axis was  $+140^\circ$ ; digitalis effect was demonstrated. On the *third hospital day* the right upper extremity and the right side of the thorax and head were less cyanotic than the remainder of the body, with a sharp line of demarcation down the midline of the sternum separating the pink skin on the right side from the blue on the left side. The sodium was 117 mEq, the potassium 4.0 mEq, and the chloride 83 mEq per liter. The urea nitrogen was 32 mg per 100 ml. A specimen of arterial blood, taken with the patient breathing 100% oxygen, revealed that the partial pressure of oxygen was 28 mm of mercury, the partial pressure of carbon dioxide 39 mm of mercury, and the pH 7.42. The inspired oxygen concentration was decreased to 40%, without change in the infant's color or condition.

On the morning of the *fourth hospital day* the nasotracheal tube was removed; the patient was able to breathe with minimal retraction. Four hours later the partial pressure of carbon dioxide was 41 mm of mercury, and the pH 7.40. X-ray films of the chest showed no change. In the evening the respiration became more labored, and the breath sounds were fainter; the

cyanosis increased, and he became unresponsive. The partial pressure of carbon dioxide was 70 mm of mercury, the carbon dioxide content was 33 mEq per liter, and the pH was 7.28. The nasotracheal tube was replaced, with resumption of artificial ventilation. On the *following morning* seizures involving the left side were observed. A specimen of blood from the right radial artery, taken with the patient breathing 60% oxygen, revealed that the partial pressure of oxygen was 67 mm of mercury, the partial pressure of carbon dioxide 24 mm of mercury, and the pH 7.55; in a specimen of blood simultaneously obtained from the umbilical artery the partial pressure of oxygen was 25 mm of mercury, the partial pressure of carbon dioxide 33 mm of mercury, and the pH 7.51. The calcium was 5.6 mg, the phosphorus 5.6 mg, and the protein 4.4 gm per 100 ml. After the administration of calcium glucoheptonate the seizures subsided. He remained moderately cyanotic while on the respirator.

On the *sixth hospital day* the sodium was 134 mEq, the potassium 6.5 mEq, and the chloride 110 mEq per liter. The urea nitrogen was 9 mg per 100 ml, and the hematocrit was 58%. An electroencephalogram was within normal limits. On the *following day* an x-ray film of the chest showed areas of consolidation with slight loss of volume in each upper lobe. Artificial ventilation was continued. On the *eighth hospital day* a specimen of blood from the right radial artery, taken during the administration of 60% oxygen, showed that the partial pressure of oxygen was 65 mm of mercury, the partial pressure of carbon dioxide 35 mm of mercury, and the pH 7.43.

The calcium was 9.3 mg per 100 ml. Curare was discontinued. The patient was unable to maintain adequate ventilation, with striking intercostal retractions and gasping respiration. On the *tenth hospital day* the cardiac rate slowed from 150 to 120 and diminished during the evening to 60. An electrocardiogram demonstrated complete bundle-branch block, atrioventricular dissociation and ectopic ventricular complexes. The peripheral pulses disappeared, and the infant died. ☞

#### Normal Values at Birth

| Test             | Birth                                       |
|------------------|---|
| Hemoglobin       | 15–24 g/dl                                  |
| Hematocrit       | 44–64%                                      |
| WBC count        | 9–30/mm <sup>3</sup>                        |
| Neutrophil       | 45%   |
| Lymphocytes      | 30%   |
| Immature cells   | 10%   |
| Sodium           | 134–144 mM/L                                |
| Potassium        | 3.7–5.0 mM/L                                |
| Calcium          | 7.0–12.0 mg/dl                              |
| Phosphorus       | 3.5–8.6 mg/dl                               |
| Chloride         | 96–106 meq/L                                |
| Fasting glucose  | 20–90 mg/dl                                 |
| Heart rate       | 120–160/min                                 |
| Respiratory rate | 60/min for 1–2 days<br>25–40/min thereafter |
| Temperature      | 36.5–37.3°C (97.7–99.1°F)                   |

## Ronald Grant (1910–1987)

Ronald Grant, who died in December 1987 at the age of 77, was the epitome of a physiologist cast in the Sherringtonian mold. Those of us who knew and studied with him at Stanford were deeply impressed and affected by his broadly based knowledge of mammalian physiology that spanned the period of time that many might fondly reflect as being the golden era of physiology.

Trained in Edinburgh, Ronald Grant came to Stanford to work on general aspects of temperature regulation. Climbing quickly through the academic ranks, he distinguished himself as a task-master teacher of medical and graduate students, as well as innovative researcher. He is probably best remembered for his studies on pyrogen fever. For example, he and Bill Whalen (APS member, retired) did a series of brilliantly conceived studies characterizing the mechanisms of pyrogen fever and the role of an "endogenous pyrogen" that mediated LPS-induced hyperexia in rabbits. Because of the limits of technology at the time (1950–1956), Grant was unable

to identify the chemical features of this serum factor. Today, we know it as Interleukin 1.

His cadre of graduate students was small by today's standards, yet he devoted himself tirelessly to his students' development and attainments so they would be worthy of being called physiologists. He was a main-stay in the department's teaching mission in a generation when physiology was a major force in the medical school curriculum. With the consolidation of the medical school on the main campus in 1959, he continued to serve Stanford and physiology, although the new curriculum tended to deemphasize physiology in favor of the "New Biology" that was emerging.

Those of us who worked at his side during the 1950s will remember the afternoon tea-making ritual that took place in his physiology laboratory. He would stop everything at 4:00 P.M., fill a large beaker with water, bring it to boil, and place his measure of tea to steep. Three spoons of sugar sweetened his afternoon repass. It was during this civilized, relaxing time that we got to know Ronald Grant as a friendly and solicitous mentor, a brilliant intellectual, superbly trained as a physiologist, possessing a wealth of knowledge. He was

a teacher of excellence and a disciplined and patient researcher. In an era when Stanford Physiology has turned to "molecular physiology" as a stated course, a Ronald Grant might be out of place. Yet, pity the generation of "physiologists" who will wear that label who will not have had the opportunity to view integrative, mammalian physiology as taught by this disappearing breed of master physiologists like Grant. Stanford, physiology, and APS may point with pride to the fact that he nurtured a generation of scientists and physicians who still carry on the romance with mammalian physiology that he so cherished and championed as both teacher and investigator. Ronald Grant will be hard to replace. He will be missed.

Joseph V. Levy

### Moving?

If you change your address or telephone number, please notify the APS office (301-530-7171) as soon as possible.

### Council Approves Program of Strategies to Counteract Efforts of Animal Activists

The American Physiological Society has initiated a series of strategies as a means to counteract the animal activists who are working to prohibit the use of live animal models in research and teaching laboratories.

The strategies were developed in March by the newly created Committee on Governmental Relations Initiative Programs (GRIP) and were approved by the Council in May.

The Council established the GRIP Committee in October and charged it to develop short-term and long-term educational, informational, and political strategies for the Society's use in its efforts to meet the challenges of the animal activists. The committee was selected from APS members who have been successful in rebutting animal activists at the grassroots.

Some of the strategies approved by the Council are that

- APS be on record opposing any legislation that would restrict the use of laboratory animals;
- All APS members be asked to contact their Congressional delegations to express opposition to HR 778 and SB 1457, the Pet Protection Acts of 1988. (The opposition of APS to these bills is that they do not protect pets inasmuch as the legislation does not apply to animal pounds or dealers. What the legislation would do is to make researchers ineligible for federal funds should unclaimed pound animals be used, regardless of the source. Enactment of this legislation would force researchers and educators to use only purpose-bred animals, thus raising the cost of research and, thereby, reducing available grant funds.)
- APS publish a manual for its members on "How To Work With The Congress" and brochures for students on the use of animals in teaching laboratories;
- APS continue its efforts to keep the Silver Spring monkeys from being given to animal activists organizations and that efforts be continued to assure that tissues are harvested and the science is completed upon the death of the monkey(s);
- APS encourage FASEB to endorse and publicly support APS positions and encourage other societies to endorse APS positions;
- APS survey its membership to develop a data base identifying members who

#### GRIP Committee

Members of the Committee on Government Relations Initiative Programs are David J. Ramsay, Chairman, Thomas F. Burks, Allen W. Crowley, Jr., Arthur C. Guyton, Francis J. Haddy, Howard Lowensohn, Richard L. Malvin, Sidney Solomon, and Fred Zechman. The chairmen of the Animal Care and Experimentation Committee (Ramsay) and the Public Affairs Executive Committee (Malvin) are ex officio members of the GRIP Committee.

have relationships with Congressional and executive branch officials, the key legislative contacts at members' institutions, and the current animal use by the members;

- APS encourage and coordinate visits to Congressional offices by members whenever they are in the Washington area;
- APS conduct a half-day workshop on legislative issues the day before the Spring and Fall Meetings;
- APS develop a source book/newsletter that would advise members how to develop local coalitions; where materials, such as video tapes, pamphlets, etc., may be obtained; list knowledgeable speakers; and to provide background information on current issues;
- APS continue its efforts to make break-in, thefts, and vandalism to federally funded research institutions a federal offense.

At the recommendation of the GRIP Committee, the Council instructed the Society's Animal Care and Experimentation Committee and the Public Affairs Executive Committee to develop the following proactive programs.

Animal Care and Experimentation Committee:

- Model legislation that would amend the Animal Welfare Act to include pound, shelters, animal clinics, and hospitals, kennels, and pet shops;
- Model pound release law for use by states and local governments;
- Amendments to the Pet Protection Act that would make it acceptable legislation for protecting pets;
- Model regulations for the Animal Welfare Act sections that deal with exercise for dogs and the psychological well-being of primates.

Public Affairs Executive Committee:

- Establish a network with other non-scientific organizations concerned with the animal issues;
- Develop relationships with science fairs wherein APS can be involved as a cosponsor for special programs, such as essay contests;
- Create long-term programs that can be used to educate and inform the public, including elementary and high school teachers, about the need to use laboratory animals.

### Maryland Rejects Animal Test Ban Despite Dear Abby's Advice

The Maryland General Assembly, which last year came within hours of enacting a ban on the use of laboratory animals for testing consumer products, rejected the same proposal this year by overwhelming margins.

State Senator Margaret Schweinhaut—who has been the guardian for animal rights in the Maryland legislature for many years and the chief sponsor of last year's bill—said she changed her mind about animal testing because it "puts in jeopardy

young children who get into household products. It's people vs. animals."

Animal activists publicly charged her with "being corrupt" for changing her mind after meeting with lobbyists from the medical community.

The shift by Schweinhaut undoubtedly had a major affect on the general assembly. Last year both houses passed legislation that would have banned the use of live animals for eye irritancy tests, including the Draize test, and acute toxicity tests for

the purpose of testing cosmetics or household products, but the bills died when a House-Senate conference committee could not agree on legislative language before the 65-day session ended.

Last year the bills were introduced late in the session and the research and testing communities did not organize to actively oppose the animal activists. This year the research and testing communities were prepared and the bills were defeated in committee by votes of 8-3 in the Senate and 14-6 in the House. Last year the bills were passed by the assembly by margins of 40-2 in the Senate and 95-14 in the House.

The defeat of this legislation is significant for two reasons.

1. Maryland had been targeted by a coalition of animal activists to be the example for other states to follow. To showcase this effort PETA (People for the Ethical Treatment of Animals) brought from California Abigail Van Buren, whose "Dear Abby" is the world's largest syndicated advice column, to testify on behalf of the legislation.

(At a news conference later Van Buren said that she intends to use her column to speak out for animals. However, what must have been traumatic for animal activists was a picture in *The Washington Post* of Van Buren wearing a white mink cape she had purchased in Maryland the next morning. When asked about the cape Van Buren said that she was not opposed to the use of animals for tests of medical products or for fur coats, adding, "... and I do like a good steak".)

2. The defeat added to a growing number of set backs in states targeted by animal activists. In each case the defeats were the results of coordinated grassroots opposition.

## Man Fined and Sentenced for Oregon Animal Lab Thefts

An animal activist has been fined \$34,900 and sentenced to 90-day detention in his home for his part in a 1986 break-in and theft of 135 animals from the University of Oregon.

Rogert Troen, 56, of Portland was found guilty on charges of first-degree theft, conspiracy to commit second-degree burglary, and second-degree burglary and was sentenced in Portland by Lane County Circuit Judge Edwin Allen. He could have received fines of \$100,000 and five years in prison on each charge.

In addition to the fine and the home detention, where he must wear an elec-

tronic ankle bracelet to enable police to track his movements, Troen also was sentenced to 250 hours of community service, placed on five years probation, and told not to associate with coconspirators of the break-in or with members of the Animal Liberation Front, which claimed responsibility for the raid.

Allen told Troen the fine will "determine how sincere" his coconspirators are about their cause and if they "are in fact sincere, they will send you large checks so you won't have to pay this \$34,900 all by yourself."

The Oregon court action marks the second time animal activists have been convicted and sentenced in connection with a break-in at an animal research facility. In 1985 a California couple was fined \$10,000 for possession of stolen goods after receiving rabbits and mice taken during a raid on a research laboratory at the City of Hope.

## Massachusetts Coalition Seeks More Controls on Farm Animals

Massachusetts animal activists, who were successful four years ago in securing the nation's most restrictive legislation concerning the use of unclaimed pound animals, now have taken aim on the state's animal farmers.

The Coalition to End Animal Suffering and Exploitation (CEASE) has led a successful attempt to place a referendum on the November ballot that would require the Massachusetts Commissioner of Food and Agriculture to issue regulations to ensure that farm animals are maintained in good health and that cruel or inhumane practices are not used in the raising, handling, or transportation of farm animals.

To accomplish this the referendum calls for a scientific advisory board, consisting of the director of the division of animal health and four members approved by organizations for the prevention of cruelty to animals, to develop and implement humane standards or animal care.

The referendum, which proposes amendments that duplicate many of the regulations dealing with farm animals, is considered as an effort by antivivisectionist and vegetarian organizations to place additional rules on farmers producing animals.

W. M. Samuels

**Sen. Ford withdraws pet protection bill. See story on page 40**

## PEOPLE AND PLACES

Leonard S. Jefferson, Ph.D., has succeeded Howard E. Morgan as chairman of the Department of Physiology, Hershey Medical Center, Pennsylvania State University, Hershey. A member since 1970, he served as chairman of the Society's Education Committee and currently is editor of the *American Journal of Physiology: Endocrinology and Metabolism*.



A cardiovascular pathologist, Sherman Bloom, M.D., George Washington University Medical Center, has become president of the Scientists Center for Animal Welfare in Bethesda, MD. Bloom has served on the center's board of trustees for six years.

Richard L. Moss, Ph.D., professor, has accepted the chairmanship of the Department of Physiology, University of Wisconsin, Madison.

Formerly at Mount Zion Hospital and Medical Center, San Francisco, Craig D. Logsdon, Ph.D., has moved to the Department of Physiology, University of Michigan, Ann Arbor.

Thurman D. McKinney, M.D. has moved to the Department of Medicine, University of Texas Health Science Center, San Antonio, from Indiana University Medical Center, Indianapolis.

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.

**This publication is available in microform from University Microfilms International.**

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## OPINION

### To the Editor

After reading your recent article in *The Physiologist* [vol. 31, p. 1, 1988], I support your view on animal rights that education will be the only solution to the problem. Each of your remaining views, however, were incredibly naive. The public is not the only group ignorant of the facts. Our own scientific community is sadly uninformed to no less an extent, and we need greater enlightenment on the animal rights issue before we can teach "the public."

My personal experiences with the vast majority of "animal activists," who many scientists view as radical or naive, is that they are neither. In fact, many are highly educated and better informed than the scientific community.

Perhaps you personally have not witnessed mishandling or abuse of animals in your institution but it does exist. The animals usually receive adequate care in the animal facility. However, once they are removed from the facility, there is no regulation, in most institutions, concerning their care and handling. This is the largest problem area. What is needed is an educational program within each institution to assure that every investigator or technician is competent in handling an animal. Unfortunately most institutions do not have funding for such an important program.

But the mishandling of animals is not the only issue we face; so is the quality of the science. A veterinarian at this institution discovered a rabbit with a broken back used for antibody production. The veterinarian needed to know which investigator was responsible for the animal so he could euthanize it. That animal suffered prior to the discovery of the broken back and would suffer longer while permission was obtained to alleviate the suffering! But from a scientific perspective, what is the quality of the antibody in an animal experiencing that degree of stress? Unfortunately, many investigators view animals as nothing more than "lab reagents" without regard to their physical or emotional well being.

Many proposed amendments to animal use in research are nothing more than attempts to appease animal activists. The vast majority of animal activists are not only concerned with experimentation on animals, but also to all creatures being violated or tortured.

As we become sophisticated in our technology and investigate at a molecular level,

we find more differences in analogous proteins between species instead of finding more similarities. For example, a single base pair alteration leading to a single amino acid substitution in a non-human protein in a critical cleavage region or cellular recognition site can result in a protein that can greatly differ in its function from a human analogous protein. The point is that knowledge gained from animal research needs ultimately to be applied to human clinical situations and in many instances, it cannot. This not only results in the sacrifice of hundreds of animals, but the misleading of scientific thought as well as hindrance of progress.

At a 1984 subcommittee meeting on biomaterials of the International Committee of Thrombosis and Haemostasis, I learned that the cow and dog were the animals used for the majority of artificial organ and vessel research. When questioned why these animals were being used, since neither animal's blood contact activation system resembles that of human, I was told by the subcommittee chairman that only platelets are important in that system because the biomaterials are non-reactive to blood. There is no material in existence that does not promote contact activation of blood! When I returned to my laboratory and discussed the response with the department chairman who was equally shocked, he assisted me in sending the subcommittee chairman several reprints. The implication of that type of animal research is that although the cows and dogs may be healthy and happy after receiving certain biomaterials, these materials could result in fatal thrombotic episodes in man. This, as you can well imagine, is no minor issue. However, it is a perfect example of the "communication gap" that exists between the various disciplines of the scientific community involved in research. Moreover, given modern communication technology, there is no reason why thorough searches are not performed prior to embarking on projects of this magnitude. Your focus, Dr. Frank, has been limited to the "communications gap" between the public sector and the scientists.

I have asked several investigators, out of curiosity, why they selected a particular animal for their research. While some answers appear to be scientifically sound, others were not. For example, several investigators selected an animal that was "easy to handle." As far as I am concerned "easy to handle" says nothing about the microphysiology or biochemistry of the animal which will be ultimately used as a model for humans. Other investigators selected an animal based on publication by their predecessors in reputable journals.

### 1988 APS Spring Meeting Report

The Society gratefully acknowledges the contributions received in support of the Annual Spring Meeting, Las Vegas, Nevada, from the following:

- Abbott Laboratories, Inc.
- American Cyanamid
- The Grass Foundation
- ICI Pharmaceuticals
- Janssen Pharmaceutica
- Lilly Research Laboratories
- McNeil Pharmaceutical
- G. D. Searle & Company
- Smith Kline Beckman Corporation
- Smith Kline & French Laboratories
- Syntex Corporation
- Wyeth Laboratories, Inc.

This, however, may not be scientifically sound if the predecessors failed to determine the applicability of the knowledge gained from these experiments to human clinical situations.

When a grant or manuscript is reviewed, it is done by a supposed "panel of experts." However, we all know that it is impossible to keep abreast of all the literature in one's own field as well as in areas which interplay with our own. The result is that many projects are funded of no value and many manuscripts are published with information misleading future investigations.

You have presented the animal rights movement as a "battle" between "us" and "them." Rather, it would be to the betterment of science, animals, as well as humans if this issue were not perceived as a battle but rather an issue deserving of discussion and resolution in a fair way beneficial for all. The animal activists have been attempting to raise the consciousness of the scientists about very real issues. In response to the animal activists, many scientists become defensive and view the animal activists as a threat. If we are doing nothing wrong, we certainly have nothing to fear. Although I am vehemently opposed to laboratory break-ins, I am not opposed to hearing, with an open mind, what these people have to say. Furthermore, the time has come to assess the scientific validity and value of our animal experimentation before we are forced to do it by the "uneducated masses."

Cheryl F. Scott  
Temple University  
Thrombosis Research Center

by Paul Johnson, made the decision to explore the possibility of cooperating with a commercial publisher to give the program more financial stability and flexibility. The maintenance of the high standards of our program was a paramount concern in these explorations. We believe that our new agreement with Oxford Press meets our dual objectives of preserving the quality of our book program and at the same time giving us greater financial stability and flexibility. For example, as a result of the new agreement, we will be able to continue to produce the *Handbooks* and also embark on a new "techniques"-oriented series without financial risk to APS.

We have also started a highly successful new journal, *News in Physiological Sciences*, which contains short review articles for the nonspecialist. Knut Schmidt-Nielsen, the founding editor, has created a journal that gives us an opportunity to stay abreast of the rapid changes occurring across the broad front of physiological research. APS members now receive the journal as a privilege of membership.

The Publications Committee has also initiated a new section of the *American Journal of Physiology* entitled *Lung Cell and Molecular Physiology*. We are convinced that this new journal will fill an important need by providing those working on the lung with a forum for work that is not appropriate of the highly successful *Journal of Applied Physiology*.

## Public Affairs

Another cyclical event over the past century is the battle between those who believe in the rational use of animals to better humankind and their opponents, the antivivisectionists. The current upswell of antagonism to the use of animals is manifested by a combination of the civil disobedience tactics of terrorists and sophisticated media campaigns. In this age of mass communication, we must be able and willing to state our case clearly and effectively so that the public and its representatives will be well informed when they must make decisions on this issue. APS works closely with a number of other organizations but is one of the clearest and most consistent voices for the biomedical researcher. We have recently stepped up our efforts to educate the public, and Council hopes that each member will take part in this effort. Over the coming months we will be asking for your help in informing lawmakers and in educating the students,

faculty members, and administrators of our universities and colleges.

## Education

Our Society has taken the leadership in aiding minority group members who wish to pursue a career in physiology through the efforts of the Porter Development Committee. We can all take pride in the increasing numbers of minority physiologists who have taken their places in our departments. Last year we increased our efforts to attract minorities to physiology with a grant from the NIDDK to support their travel to our meetings. Our first experience with this program was at the Fall Meeting in San Diego and everyone who participated was impressed with its usefulness.

Council has recognized the challenge that our members face in providing their graduate students with an adequate grasp of the integrative or systems approach to biology, which is our unique strength, and also a strong background in modern biology. It has asked the Education Committee to consider this problem and to devise some potential approaches to meeting the challenge. These approaches will be widely circulated with the hope that they will help individuals to come up with specific solutions that meet local needs.

## International Physiology

No man is an island. Our members have expressed an increasing awareness of our interrelatedness with our fellow scientists in other countries. Ties with scientists in other Western countries have been in place for many years. We have strengthened our relationship with British physiologists through a joint meeting with the Physiological Society in Cambridge in 1985, which will be reciprocated by a visit of British physiologists to our Fall Meeting in 1992.

More recently, we have begun to build our relationships with physiologists in the Eastern block and in developing countries. We have had an exchange of visits between the APS and the Pavlov's All Union Physiological Society and hope that there will be increased interchange in future years.

We lived up to our name when in 1987 we opened regular membership in the Society to any qualified physiologist living in the Americas, North, Central, or South. Representatives of the Latin American Association of Physiological Sciences and of APS have also exchanged visits, with the plan that this will lead to increased linkages in the future.

We hope that Corresponding Member-

ship will be a mechanism by which foreign scientists who have trained in our laboratories can continue to be associated with our programs and publications after they leave the Americas. Of course we also welcome other qualified scientists who do not live in the Americas to become Corresponding Members.

In 1986, we joined with the IUPS to initiate the new international journal *News in Physiological Sciences (NIPS)*. The IUPS has arranged special funding to allow physiologists in developing countries to subscribe to *NIPS* at a reduced rate. We think that this is an excellent way for these individuals to stay current at a small cost (\$10 US).

A couple of years ago our new, energetic Executive Director Martin Frank asked in a *Physiologist* editorial whether physiology was dying. I think the clear answer to that is no. Physiologists are entering a new golden age. The revolution in biotechnology has opened vast opportunities for the study of the differentiated cells that are of particular interest to physiologists. Other new technology, for example, nuclear magnetic resonance and high speed computers, is already providing answers to previously unapproachable questions. Our systems orientation provides us with a unique approach to the problems of human health. The generally parallel arrangement of our Sections and the Institutes of NIH is not an accident. It is evidence that we have the correct orientation for the study of human disease. A better question might be, "Is APS doing all it can to foster the intellectual growth of physiologists and to promote the spread of physiological knowledge?" In my opinion the answer to that question is not yet. However, our Society is financially healthy and in a position to be responsive to the energy our members bring to it. The events of the last few years suggest that our members have just begun the process of refashioning the Society to fit their needs.

Harvey V. Sparks, Jr.

### 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

**Postdoctoral Research Associate** position for a (extracellular) single unit investigation of visual memory in the awake, behaving macaque. Experience in any of the following areas is desirable: electrophysiology, mathematical/statistical data analysis, visual or mnemonic physiology. Training will accrue in these same areas. Enthusiasm and general ability are as important as specific experience. The stipend is at NIH levels, with the position available as early as July 1988. Send vitae and the names and addresses of three references to Dr. James Ringo, Department of Physiology, Box 642, University of Rochester Medical Center, Rochester, NY 14642. [EOAEE]

**Faculty Position, School of Human Biology.** The School of Human Biology at the University of Guelph invites applications for a tenure-track position at the Assistant Professor level in human biomechanics. In particular we are seeking a person whose research interests and background intersect with physiology, ergonomics, or any of the School's current interests, including neurophysiology of motor control; skeletal muscle physiology, biochemistry, and metabolism; cardiovascular and pulmonary physiology; quantitative biomechanics; er-

gonomics; skeletal aging and gerontology; auxological genetics and craniofacial development; morphology; human and medical genetics; biological basis of behavior. Applicants should have a Ph.D. or equivalent and an active research program. The successful candidate's responsibilities will include teaching of undergraduate and graduate courses in human biomechanics and/or related areas of human biology, supervision of graduate students, and pursuance of an independent research program. Applications for this position (which is subject to budgetary approval) should include a curriculum vitae and names of three referees. Applications, which will be accepted until the position is filled, should be sent to Dr. Stan R. Blecher, MD, FCCMG, Professor and Director, School of Human Biology, University of Guelph, Guelph, Ontario, N1G 2W1. In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. [EOAEE]

**Chairperson, Department of Physiology and Biophysics.** The University of Puerto Rico School of Medicine invites applications for the position of chairperson of the Department of Physiology and Biophysics.

### 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.

Candidates must have an outstanding record of research, a strong commitment to medical and graduate education, and the capability to direct the service missions of the department. Applicants must provide CV, name of three references, and a statement of research interests to Dr. José L. Cangiano, Chairman, Search Committee for Physiology and Biophysics, Department of Medicine, Veterans Administration Hospital, G.P.O. Box 5800, San Juan, P.R. 00927-5800. Phone: (809) 758-7575, ext. 5000.

## ANNOUNCEMENTS

### *World Directory of Physiologists*

The *World Directory of Physiologists* is now available. The 1988 edition of this unique and invaluable *Directory* reflects intense dedication to the ideals of scientific communication. The enormous task of collecting, verifying, organizing, inputting, and publishing these data about the individual physiologists and other scientists who are members of 56 IUPS societies has resulted in a completely up-to-date record of over 24,000 scientists from 49 countries.

Entries in the *Directory* include the following information organized by national society: Member's Name, Address and Telephone Number; Professional and Graduate Degrees; Physiology Speciality; Professional Title/Position. The *Directory* is fully indexed. The editor is Jean Scherrer. The executive director is Orr E. Reynolds. The publisher is International Union of Physiological Sciences.

The *Directory* is also available as a mailing list. Labels can be supplied for specific countries, specialties, or societies. For mailing label

information contact World Directory of Physiologists, c/o FASEB, 9650 Rockville Pike, Bethesda, MD 20814, USA.

### *Annual Review of Physiology Celebrates Golden Anniversary*

Annual Reviews Inc. is proud to announce the publication of Volume 50 of the *Annual Review of Physiology* in March 1988. The *Annual Review of Physiology*, second oldest of the 27 series published by Annual Reviews Inc., was initiated in 1939. In its early years the series was jointly published by Annual Reviews and the American Physiological Society. Although joint sponsorship was discontinued in 1962, the series has continued to flourish and remains a preeminent reference in its field.

Dr. J. Murray Luck, the founder of Annual Reviews Inc., was the first editor of both the *Annual Review of Biochemistry* and the *Annual Review of Physiology*.

The *Annual Review of Physiology* is divided into 8-10 sections, each of which has its own section editor and deals with an important aspect of physiology. Carefully chosen authors are invited to critically review current research. The volume always begins with a special prefatory

chapter by a distinguished physiologist. (In Volume 50, Sir Andrew Huxley of Trinity College, Cambridge, England, discusses muscle contraction). The 40-50 chapters contained within these sections every year summarize the work of the best researchers in these fields. Dr. Robert M. Berne, of the University of Virginia Medical School, is the latest distinguished scientist who has served as editor of the *Annual Review of Physiology*. Dr. Joseph F. Hoffman, of Yale University Medical School, will guide the series into its second half century as he becomes Editor beginning with Volume 51.

The per copy price of the *Annual Review of Physiology*, Volume 50 is \$36.00 USA & Canada, and \$40.00 elsewhere, postpaid. The volume is casebound, contains 741 pages with indexes, and is available through bookstores and subscription agents, or direct from Annual Reviews Inc., 4139 El Camino Way, P. O. Box 10139, Palo Alto, CA 94303-0897, USA. Phone: 1-800-523-8635 (except in California). California customers use 415-493-4400. (not toll free).

### ASCB/EMBO Conference

A conference, Sorting in Eukaryotic Cells, jointly sponsored by the American Society for Cell Biology (ASCB) and the European Molec-

# 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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ular Biology Organization (EMBO), will be held September 11-15, 1988, at the Atholl Palace Hotel, in Pitlochry, Scotland, UK. A poster session will be included. **Organizers:** William E. Balch, Yale University, New Haven; Alan Colman, Birmingham University, England; Suzanne R. Pfeffer, Stanford University, Stanford; Graham B. Warren, University of Dundee, Scotland. **Information:** ASCB/EMBO Conference, ASCB National Office, 9650 Rockville Pike, Bethesda, Maryland 20814. Phone: (301) 530-7153.

## NIH Reviewers Reserve Established

The National Institutes of Health is establishing the NIH Reviewers Reserve (NRR), which is expected to become operational in July. Selected as needed, members of this Reserve will be able to participate fully in meetings of NIH's chartered scientific review committees that evaluate grant and cooperative agreement applications and research and development contract proposals.

The Division of Research Grants (DRG) will manage the Reserve for trans-NIH use. Nominations to the Reserve will be made by the various NIH components, primarily from among the pool of retired members of chartered NIH review committees. On behalf of the Director of NIH, the DRG Director will select, invite, and appoint highly qualified scientists and other technical experts to serve on the Reserve. Appointment to the Reserve may be for up to four years, as long as members file and maintain current Form HHS 474 (Statement of Employment and Financial Interest) and do not accept appointment to any chartered Department of Health and Human Services public advisory committee. During any one grant review cycle, Reserve members may each participate with up to two chartered scientific review committees,

at the request of the committee's Executive Secretary. The number of Reserve members that may participate in this capacity at a given chartered review committee meeting is limited to no more than one-half of the committee's quorum.

As in the past, Committee Executive Secretaries may also ask ad hoc special individual reviewers to provide advice and counsel to chartered review committees; ad hoc special reviewers do not have the rights, privileges, nor obligations of appointed committee or Reserve members and do not offer or vote on motions nor assign priority ratings.

The roster of reviewers provided as part of the summary statement (pink sheet) will list and specify appointed committee and NRR members and ad hoc consultants.

## AIDS Prevention and Service Projects

The Robert Wood Johnson Foundation announces the availability of grant support for creative projects to prevent the spread of AIDS and/or to improve services for people with AIDS and AIDS-related illnesses. Applications for AIDS prevention and service projects will be considered from community groups, organizations, or agencies that are tax-exempt under Section 501(c)(3) of the Internal Revenue Code. Government agencies are also eligible. Private foundations, as defined under Section 509(a), are not eligible.

Applicants should state the elements and goals of the proposed project briefly and concisely; include a preliminary budget with justification and letters of support. Questions concerning proposal preparation should be directed to Paul S. Jellinek, Ph.D., Senior Program Officer. Proposals should be addressed to Proposal Manager, The Robert Wood Johnson Founda-

tion, College Road and U.S. Route 1, P.O. Box 2316, Princeton, NJ 08543-2316. Phone: (609) 452-8710. Proposals must be received by July 1, 1988.

## Artois-Baillet Latour Health Prize

The biennial Artois-Baillet Latour Health Prize of a value of five million Belgian francs (5,000,000 BEF) will be awarded in 1989. This prize will reward "an important contribution to the knowledge of the role of viruses and oncogenes in cellular pathology, leading to novel therapeutic approaches in human medicine." Candidatures shall be sent to The Secretary General, National Fund for Scientific Research, rue d'Egmont 5, B-1050 BRUSSELS (BELGIUM) before July 1, 1988. An account of the candidate's work, of at least three pages written in English, shall be sent by the proposer. The 1988-1989 prize will be awarded in the spring of 1989.

## OSU Receives ERIC Clearinghouse Contract

A contract for ERIC Clearinghouse for Science, Mathematics, and Environmental Education has been awarded to The Ohio State University for a five-year period (1988-1992). ERIC/SMEAC will continue to process materials for *Resources in Education (RIE)* and *Current Index to Journals in Education (CIJE)*, produce 12 digests and an annual bulletin in 1988, produce eight monographs, and to provide assistance to users to help them locate information. People, organizations, and institutions that desire to receive the free annual bulletin can write to ERIC/SMEAC, 1200 Chambers Road, Room 310, Columbus, OH 43212. Phone: (614) 292-6717.