THE PHYSIOLOGIST

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EDITORIAL

Plans for the Future

As the APS prepares for its Centennial Celebration, the Council has begun preparations to provide the Society with a birthday present that will not be a surprise. The gift is a revised governance package that, based on the responses received from the membership, has been long overdue. According to one member the proposed changes "wisely and effectively address substantive problems which have plagued us in the past." Another member writes "it represents a major forward-step in recognizing the diversity of the 'community of physiologists' and affords these diverse interests due representation in the decision making apparatus of the Society."

These comments are representative of the membership's response to the "100th birthday present" set forth in Franklyn Knox's letter to the membership. In brief, the combined work of the Long Range Planning Committee, Section Advisory Committee, and Council has yielded a proposal designed to increase sectional input to the governance of the Society as a whole. To accomplish these ends, the proposal recommends *1)* an increase in the size of the Council to six Councillors and three Presidents; *2)* a strengthening of the Sections by identification of membership and formalization of representation on the Section Advisory Committee; *3)* the selection of a Nominating Committee in order to accomplish a balanced representation over time for the various Sections of the Society; and *4)* the simplification of the voting process in order to eliminate the preferential ballot.

The recommendations represent sweeping changes resulting from exten-

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Problems of Teaching Physiology in Developing Countries

George G. Somjen
Department of Physiology, Duke University Medical Center

A series of workshops on the teaching of physiology were held at the IUPS Congress. The initiative for these came from Ann Sefton, Hugh McLennan (chairman of the Congress Program Committee), and Keith Cooper (chairman of the IUPS Commission on Teaching). Considering that the sessions were scheduled for the lunch hour of successive days of the Congress, attendance was remarkably good and discussions lively and useful. The last in this series was the workshop on Teaching Physiology in Developing Countries, chaired by George Somjen.

There were four short scheduled papers, followed by general discussion. Ken Lukowiak of the University of Calgary talked on "Starting a new program: experiences in Katmandu." The first and only medical school in Nepal opened seven years ago and has graduated two classes so far. A unique feature is the requirement that students applying for admission must first have completed three years service as nurse, health technician, or in another job in health care somewhere "in the field." Although some pressure is being exerted by certain circles to relax this rule, so far it has succeeded in ensuring the selection of those truly dedicated to the healing profession. Besides shortage of staff, equipment, materials, and books, the greatest problem Lukowiak encountered while teaching in Katmandu was the inclination of the students to take every word uttered by the lecturer as the absolute truth and their reluctance ever to question or argue. Lukowiak's presentation was livened not only by slides of the Katmandu campus but also stunning pictures of the Himalayas. Climbers who also happen to be physiologists should seriously consider spending a sabbatical in Katmandu.

The second speaker was Clifford Obih of the University of Ibadan in Nigeria, currently spending a year's leave at Duke University. The department in Ibadan that, having been opened shortly after the Second World War, is the oldest in West Africa and has 12 staff members. The medical school in Lagos also has a relatively well-established Physiology Department. But even in Ibadan the teaching load is very heavy since, besides a large medical class, there are students in dentistry, nursing, and science (B.Sc. as well as postgraduate) to be taught. Interruptions of power and water have become less frequent in recent years, but shortage of manpower, equipment, and books persist. Nevertheless the Department in Ibadan and some of the others manage to give a full medical physiology lecture course of three semesters (1.5 years) supplemented by laboratory exercises, which is not always possible at some of the newer Nigerian universities with even sparser resources. Dr. Obih made a plea for urgent help in the form of books, all types of teaching aids, and research equipment, including computer software and long-term assistance in staff-exchange programs and training.

The next report was by R. Albertini of the Catholic University of Chile, president of the Latin American Association of Phys-

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Report of a workshop held in Vancouver at the XXX Congress of the International Union of Physiological Sciences, July 18, 1986.

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sive discussion with Society members over the last several years. To accomplish the goal of a new governance plan for our second century, it will be necessary for the membership to approve the Bylaw changes recommended by the Council at its meeting in New Orleans. The proposed Bylaws can be found on page 208 for your consideration at the APS Business Meeting scheduled for Wednesday, April 1, 1987, during the Centennial Meeting.

The revised governance package is just one of several initiatives undertaken by the Council to prepare the Society for its second century. Over the last several years, the Society as well as departments of physiology have been dealing with a changing perception of physiology as a discipline. Should physiology be defined by its integrative nature or by a reductionist view based on evolving cellular and molecular approaches? This discussion will ultimately affect the future of departments of physiology and the teaching of physiology.

To assist the Society and membership to deal with modern biology, the APS Council unanimously approved a "Plan to Foster the Integration of Molecular and Cellular Biology with Systems Physiology." The plan, as set forth on page 220 of this issue, is designed to facilitate a unification of molecular and integrative physiology. The plan set forth by Council should be viewed as a long-range plan involving a number of Society committees as well as the Association of Chairmen of Departments of Physiology. The plan is forward looking and should contribute to an enhanced perception of physiology and APS.

One aspect of the plan involves the strengthening of our scientific meetings by providing opportunities for symposia and workshops that emphasize new methods and paradigms. To accomplish this, the program will require increased resources derived from the Second Century Corporate Founders Program Endowment Fund initiated earlier this year. Through corporate and Society contributions, the Council hopes to build a $1 million endowment that will provide an opportunity for dynamic scientific programs into the second century.

In addition to improved funding for the program, the Council is also attempting to strengthen the Fall Meeting through the development of a thematic approach. Building on the model of the Gordon Conferences, the program committee has developed a symposia program encompassing several themes that continue throughout the meeting. The 37th Annual Fall Meeting in New Orleans was the Society's first thematic meeting. While the attendance was lower than expected for the Fall meeting, the scientific content was excellent, providing attendees an opportunity to participate in a full four-day program.

The Society has also been strengthened by the passage of a Bylaw amendment providing Regular Membership to physiologists living throughout the Americas. The Bylaw change, unanimously approved at our recent business meeting, was enthusiastically endorsed by APS members residing in South and Central America. The following comments are indicative of the enthusiastic reception the proposal received among these physiologists. "(T)his important change will ... contribute to bridge a gap with fellow American physiologists, and strengthen the bonds of friendship and mutual cooperation." "If approved ... we scientists will have given the world an example of political integration in an era where disintegration seems to be the rule."

The numerous gifts being packaged and wrapped for the Centennial Celebration are designed to strengthen the Society and the discipline. However, the presents depend on the support of the membership and its active participation to facilitate implementation. It is the Council's hope that you will endorse the changes being proposed.

The meeting scheduled for the week of March 29–April 3, 1987, will provide attendees ample opportunities to celebrate "A Century of Progress in Physiology." Throughout the week, symposia, exhibits, and plenary sessions will focus on the frontiers of physiological sciences. The opening lectures and reception scheduled for Sunday, March 29, at the Washington Hilton will provide an opportunity for the

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iological Sciences. He emphasized the importance of research for the quality of teaching. He also presented statistics carefully compiled from numerous institutions in several countries. From these tabulations the widely varying range of research output in the Latin world became clear. The specific difficulties experienced by teachers in Latin America also vary widely. In some, relatively more affluent, centers the main problem is the overwhelming number of students. Because of the excessive teaching load, time for research is minimal. At these schools the electricity supply is reliable and computers may be available. Software for computer-assisted instruction could relieve some of the excessive burden on the teaching staff of these departments. Also, video-taped laboratory demonstrations would be useful. In other Latin American schools, however, there is a shortage of everything from books to the simplest technical tools.

The last scheduled speaker was R. Stewart, who spoke of "Teaching physiology to Third World students with resources of a developed country." At his school, the University of Stellenbosch in South Africa, the academic staff is small, but appropriate modern equipment is available. Sharing of resources is encouraged and interdepartmental rivalry minimized by integrating the teaching of physiology, biochemistry, and introductory pharmacology in a single course. The 240 students are divided into 12 small groups. Emphasis is on practical exercises, mostly on human subjects. Student groups rotate so that the inventory of specialized equipment required is relatively small. The time spent in laboratories is open ended and tutorial time extensive. Moreover, each teacher is expected to be able to handle the entire course!

During the general discussion several participants emphasized that, in the conditions prevailing in the Third World, experiments on human subjects are often more appropriate, more instructive, cheaper, and easier to handle than traditional animal experiments. Otto Hutter is said to be compiling a laboratory manual describing just such experiments. His volume may be ready later this year.

The main purpose of the general discussion, and indeed of the whole workshop, was to define the best ways to assist the development of physiology teaching in the universities of the less-affluent countries. Warning voices were heard against wasting money on well-meaning but misguided efforts. For example, the benefits may not warrant the expenditure necessary to bring one or more well-known scientists from a Western country to an exotic spot for a brief, two- or three-day event.

While two-day "junkets" are not very useful, there is always need for those who are willing to stay for an extended period, adapt to local conditions, and share the burden of work. For those who sincerely want to help it is vital not to appear arrogant and to approach customs and traditions of the host country with much tact.

Several participants emphasized the importance of building up local cadres of teachers and technicians, of fostering local strengths and talent, and encouraging training of indigenous personnel in home institutions. This point of view is underscored by the waste when young people come to the universities of the developed countries, are trained in research methods that cannot be implemented in their home environment, get used to the lifestyle, and then do not return. It is also true, however, that, certainly in the United States and probably also in Western Europe, we have "surplus training capacity." If some of the old mistakes are avoided, many young people at the pre- and postdoctoral level could be brought in and made ready to return as teacher-scientists. The first problem would be to select the most talented (not necessarily the best connected) candidates. Then a curriculum would have to be designed that should be less narrow and esoteric than the customary Ph.D. or postdoctoral program taken by our own students. The problem of the country of origin would be to ensure employment for the returning candidate. Parenthetically, these days the shrinking job market in the United States and Western Europe will more and more counteract the temptation for foreign scientists not to return home.

The opinion was then voiced that the "twinning" of two institutions fosters two-way traffic among faculties and otherwise opens channels of aid. Aspiring as well as established faculty members from a university in a developing country can then come to work at their "twin" developed institution, and the university in the developed country can loan members of its staff to the developing sister school for extended periods. Duplicate copies of books and journals and redundant equipment can also find a natural conduit for a prolonged useful life. The Calgary-Katmandu cooperation is an example and by no means a unique one. Such a program requires funding, of course, but apparently it is not prohibitively expensive.

In the same vein, the importance of collaborative research was emphasized. Well-designed projects could take advantage of climatic conditions or the availability of certain animal species in a developing country, while data processing requiring advanced technical gear could take place in the partner institution in the "West."

Whether it is cooperation in research or in teaching, building informal networks of friends is at least as important as the formal support of major organizations.

The importance of the training of technicians and other support personnel was repeatedly emphasized. Also, gifts of equipment should match the expertise of available maintenance personnel; otherwise, expensive technical gadgets will stand unrepaired and unused in corners of laboratories.

Finding the funds for assistance is increasingly difficult. The question of the role of private enterprise was raised. It was mentioned that at least one United States publishing firm is selling textbooks cheaper in the developing countries than at home. The idea was voiced that perhaps pharmaceutical companies or publishing houses could donate gift subscriptions of journals to university libraries if the donor's name were printed on the binding and the cost could be written off as advertising expense.

The participants of the workshop received a questionnaire requesting their opinions and comments. From the opinions expressed in writing and those heard at the workshop a report will be derived with practical recommendations to the Council of the IUPS. Such a report can also serve as supporting document in applications for funding involving teaching or research in physiology in a developing country.

A more extended workshop for physiology teachers from the Third World, addressing teaching techniques and other practical aspects, is planned as a satellite meeting preceding the next IUPS Congress that will take place in 1989 in Helsinki. Also to assist teachers, there will be "refresher-course" sessions at the main Congress, aimed at bringing nonspecialists up to date in rapidly moving fields of physiology. The IUPS Commission on Teaching Physiology is exploring ways to bring a larger number of faculty members from universities in Third World countries to the Helsinki meeting.

Persons who need information on these matters or who may wish to comment on topics raised in this report or who feel that they could be helpful in other ways should contact either Keith Cooper, Department of Medical Physiology, University of Calgary, Calgary, Alberta T2N 4N1, Canada, or the author of this report.

Proposed Amendments to the Society Bylaws

As outlined in President Knox's letter to the membership, the following proposal to amend the Society Bylaws was approved by Council at its retreat in New Orleans. These proposed amendments will be presented to the membership for vote at the Spring Business Meeting, Wednesday, April 1, 1987.

ARTICLE IV. *Officers*

SECTION 1. *Council.* The management of the Society shall be vested in a Council consisting of the President, the President-Elect, the immediate Past President, and ~~four~~ six other regular members. The terms of the President and President-Elect shall be one year. The terms of the ~~four~~ six additional Councilors shall be ~~four~~ three years each and they shall not be eligible for immediate reelection except those who have served for two years or less in filling interim vacancies.

A quorum for conducting official business of the Society shall be ~~five~~ six of the ~~seven~~ nine elected members of Council.

The ~~Chairman~~ Chairpersons of the Publications Committee, the ~~Chairman of the~~ Finance Committee, the Program Committee, the Education Committee, the Section Advisory Committee, and the Executive Secretary-Treasurer are ex officio members of the Council without vote. The Council may fill any interim vacancies in its membership. Council shall appoint members to all committees except the Section Advisory Committee.

In the interim between meetings of Council, an executive cabinet consisting of the President, President-Elect, immediate Past President, and the Executive Secretary-Treasurer shall implement the policies of Council.

SECTION 3. a. *President-Elect.* The President-Elect shall serve as Vice-President of the Society and as official secretary of the Council. Should he/she have to function as President prematurely, the Council shall select from among its own members an official secretary.

b. *Past President.* The immediate Past President shall serve as Chairperson of the Nominating Committee and be responsible for the annual review of the Society Bylaws.

SECTION 4. ~~Election~~ a. Nomination of Officers. Nominations for President-Elect and for members of Council will be made by mail ballot, on forms provided by the Executive Secretary-Treasurer before ~~February~~ January 1 of each year. Each member may nominate no more than one candidate for each office. If a member wishes to nominate ~~a certain~~ the same person for President-Elect *and* for Councilor he/she must nominate that individual for *each* position. ~~The four candidates that receive the highest number of nominating votes will appear on the ballot for President-Elect. The eight candidates that receive the highest number of nominating votes will appear on the ballot for Council.~~

b. *Nominating Committee.* The Nominating Committee shall consist of the immediate Past President, who will serve as Chairperson, and six members selected from the Section Advisory Committee according to a rotation plan. The Chairpersons of the Program Committee and Publications Committee shall serve as ex officio members. The Nominating Committee shall select a slate from candidates nominated by the Society membership. The slate presented for vote shall be such that no more than one of the six Councilors shall be from a single institution and no more than two of the six shall have a primary affiliation from the same section. The Nominating Committee shall make two nominations for President-Elect and five for Councilor.

c. Election of Officers. Election of the President-Elect and members of Council ~~will~~ shall be made by mail ballot, on forms provided by the Executive Secretary-Treasurer, prior to ~~April 1 of each year~~ the Spring Business Meeting. Each voting member must indicate on the ballot his ~~rank preference of *all* of the candidates on each ballot~~/her choice of the candidates for office. The candidate(s) receiving the most votes shall be elected. In case of a tie vote, the decision shall be made by lot. Ballots will be counted according to the Election Plan. Two ballots, one for President-Elect and one for Council, will be mailed together. The results of the election will be announced at the Spring Meeting of the Society and the newly elected officers ~~will~~ shall take office ~~on July 1 following their election~~ at the close of the Spring Meeting of Council.

ARTICLE V. *Standing Committees*

SECTION 5. *Program Committee.* A Program Committee composed of four regular members of the Society appointed by Council shall be responsible for scientific programs of the Society with assistance of the Program Advisory Committee. The term of each member shall be for three years; a member may not serve more than two consecutive terms. The Council shall designate the Chairperson of the Committee who shall be an ex officio member of the Council, without vote. The President-Elect and Executive Secretary-Treasurer shall be ex officio members, without vote.

SECTION 6. *Section Advisory Committee.* A Section Advisory Committee shall be composed of one regular member elected by each Section of the Society. Each member shall serve a term of three years; consecutive terms are prohibited. The Committee shall elect a chairperson from its membership to serve a three-year term. The Chairperson shall serve on Council as an ex officio member, without vote.

SECTION 5 to be renumbered SECTION 7.

SECTION 6 to be renumbered SECTION 8.

ARTICLE X. *Society Section and Affiliations*

SECTION 1. *Society Sections.* Upon acceptance of a Statement of Organization and Procedures and approval by Council, ~~any~~ an appropriate group of Regular members of the Society may form a section which encompasses an area of physiology. Such sections shall: a. participate in the governance of the Society by electing a representative to the Section Advisory Committee. ~~a.~~ b. advise the Society on matters of interest to the specialty group represented in the section. ~~b.~~ c. assist the Society in organization of scientific meetings. ~~c.~~ d. nominate individuals for membership on Society committees. ~~d.~~ e. be open to all members of the Society expressing an interest in section membership.

The Executive Secretary-Treasurer shall provide assistance to sections in the carrying out of section business.

Nothing in a section's Statement of Organization and Procedures may be construed as contradictory to the Constitution and Bylaws or Operational Guide of the Society.

PAST PRESIDENT'S ADDRESS

The American Physiological Society As It Approaches Its Centenary Year

Howard E. Morgan, M.D.
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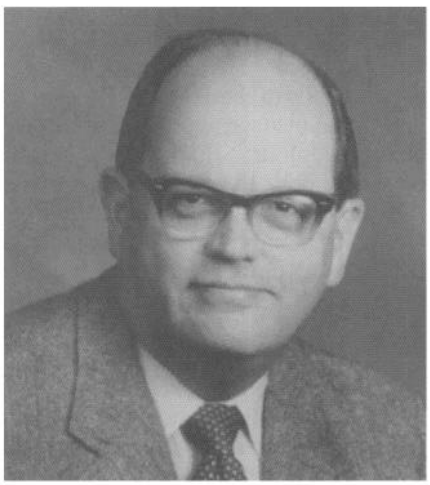
The American Physiological Society will celebrate its Centennial in 1987. As a result, this is an appropriate time to take stock of recent changes and challenges facing our discipline and the response of the Society to them. In my view, the American Physiological Society is strong, vital, and innovative and well prepared to continue a leadership role in biomedical science.

Nature of Physiology and Physiologists

Physiology is an integrative science that has as its goal discovering the mechanisms of overall bodily function and its regulation. The types of data to be integrated are wide ranging and include studies at the following levels: cellular and molecular, whole organ and tissue, and whole animal. In contrast to the common practice of many physiologists, no distinction should be made based on the technology used to collect the data or the level of organization at which the problem is attacked. All of these pieces of information are needed to provide a comprehensive understanding of basic mechanisms and their regulation. As an extension of this view, the research approach that is taken should not impact on the ability of the physiologist to teach a broad-based course in human physiology to medical students. Those physiologists who work at the systems level must be fully aware of advances at the cellular and molecular level, while those who work on molecular mechanisms must be able to integrate their data into a model of systemic function. In fact, the theme of our Centennial Celebration, "A Century of Progress in Physiology," should be regarded as a challenge for our second century that will result in a unified attack on physiological problems that involves the newest approaches and techniques.

In a similar vein, a physiologist should take an integrative as compared with a reductionist view, regardless of the technology or level of organization at which a



problem is approached. Techniques drawn from disciplines such as molecular genetics, cell biology, and immunology should be adopted widely and integrated into physiological research. These techniques have been shown to provide a new understanding of bodily function at the molecular level, which contributes to improved knowledge of function of the whole organism. For example, control of cardiac contractility by virtue of the myosin isoenzyme that is contained within cardiac muscle cells has been shown to depend on differential splicing of the initial transcript of the myosin gene, a process that is modulated by thyroid hormones.

In regard to the training of graduate students and recruitment of scientists to physiological research, are we making physiology as attractive to potential graduate students, postdoctoral fellows, and faculty members as it was to us? New scientists of the highest caliber will be attracted to physiology only if they perceive that a comprehensive attack using the most modern techniques and approaches is underway to understand integrative function. This course of action also will continue the high esteem with which clinical scientists regard physiologists, namely a basic science group using the most advanced technology to understand normal function of living systems and mechanisms of disease. Second, to what extent will scientists with degrees in related disciplines such as biochemistry, molecular genetics, cell biology, and immunology be welcomed into the community of physiologists? As we are aware, some of the most distinguished physiology departments in this country have been placed under the leadership of scientists from these related disciplines. In my view, introduction of new approaches and techniques can be expedited by welcoming those trained in related disciplines into physiological research and physiology departments. Their responsibility to the physiology community is to take an integrative rather than reductionist approach that was characteristic of their original discipline.

The Position of the American Physiological Society in Responding to the Challenge of Its Second Century

In our first century, a major challenge that faced the Society was retention of emerging disciplines within the physiology community and the Society. This challenge was not met successfully, and biochemists, general physiologists, biophysicists, and neuroscientists formed professional societies of their own. In my opinion, the important challenge of the second century will be to attract persons and to adopt approaches from fields that were never part of physiology, including cell and molecular biology and immunology, rather than to prevent additional groups from abandoning Society activities.

The Society activities that aid physiologists to adopt new techniques and approaches to research are its governance, publication activities, and scientific meeting programs. In recent years, the officers and Council of the Society have been deeply involved in considering changes in each of these Society functions.

A common theme that runs through each of these areas of activity is sectionalization. Sectionalization was a logical response to retention of special interest groups that might have left the Society to form new professional societies or journals. As a result, special interest groups were given visibility and have assumed increasingly important roles in governance, planning of the scientific meetings, and in operation of the journals. Although sectionalization has achieved the goals of retention of special interest groups and strengthening of Society activities through greater member participation, sectionalization must be recognized as contrary to the ultimate goal of an integrated understanding of bodily functions. In the long run, the "giblet" approach must fade because an understanding of physiological problems at the cellular and molecular

Presented at the American Physiological Society Fall Meeting, New Orleans, LA, October 7, 1986.

level will reveal that many basic mechanisms of operation and regulation are the same in various organ systems of the body.

In regard to governance, the Council will present to the membership a new plan that will strengthen the Sections by defining their short- and long-term goals, assuring participation of section members in section activities and governance, and encouraging greater involvement of sections in plans for scientific meetings and Society publications. Greater input to nominations of persons for President-elect and members of Council has the goal of representation of segments of the Society that may be small in numbers of members but of great importance for the Society's future, because these segments contain persons expert in new techniques and approaches to physiological research. All segments of physiology and types of physiologists from the molecular to whole-animal levels must be represented in the governance structure. In any branch of science, those persons in more applied areas outnumber those in more fundamental research; however, groups with larger numbers cannot be allowed to dominate the Society and discourage participation from new and less populous sections. The proposed governance structure strikes a balance between representation across the continuum of research activities and representation of Sections with different numbers of members.

Sectionalization of the *American Journal of Physiology* 10 years ago has been a major success for the Society. The number of manuscripts received has more than doubled, new journals representing regulatory, integrative, and comparative physiology and cell physiology were established, and the publications program has contributed to the fiscal health of itself and of the Society. The *New York Times* approach of "publishing all of the physiological research that is fit to print" that has been taken by the continuum of Publications Committees and championed by Stephen Geiger, Publications Manager, places our publications in a strong position to accept articles using new techniques and approaches for studies of physiological problems. The positive fiscal outcome of the publications program in recent years provides a strong base for future publication activities and also strengthens Society governance and scientific meetings because of increased monies for these activities. As a result, the officers and Council are able to participate more effectively with Martin Frank, Executive Secretary-Treasurer, in the ongoing planning and conduct of Society affairs. As is discussed presently, new opportunities for planning of scientific meetings have merged in the improved financial climate.

The planning of the Spring and Fall meetings has depended on input from Sections and interest groups and overall management by the Program Executive Committee. However, innovations in programming have been restricted by the availability of funds. The Council recently has acted to set aside monies derived from the publication's programs to serve as an endowment, the interest from which can support new approaches to our scientific meetings such as the thematic fall meeting. Martin Frank also has successfully sought major contributions to the Program Endowment Fund from pharmaceutical companies, including UpJohn, Hoffman, La Roche, Merck, Squibb, and Shering. The goal of the Fall thematic meetings is to attract persons using new techniques and approaches by operating one or two research conferences within a broadly based meeting. Our meetings should be equally attractive to physiologists using cellular, molecular, or immunological approaches and to physiologists who employ more traditional techniques and approaches. I believe that the changes in governance, publications, and scientific meetings strengthen the basic operations of the Society and place it in a strong position for entry into its second century.

Finally, I would encourage President Knox and his successors to base the strength of the American Physiological Society on an integrative, aggressive, and forward-looking approach to physiological research that continues to involve emerging technologies and approaches. This course of action must be reflected in governance, publication activities, and scientific programs. In this way, American physiology will attract high-caliber students and scientists and will occupy a unique position in biomedical science.

Edward W. Hawthorne
(1920–1986)

Edward W. Hawthorne, Dean of Howard University's Graduate School of Arts and Sciences, pioneered the use of electronically instrumented large animals for investigations in cardiovascular physiology. Elected to membership in 1955, he was very active in the Society as Cochairman of the Porter Physiology Development Committee and encouraged many young minority students to pursue a career in physiology. Contributions to a memorial fund may be made payable to Howard University for Cardiovascular Research Laboratory Fund, Washington, DC. Attention: Eleanor I. Franklin.

ANNOUNCEMENTS

Applications Sought for Senior and Postdoctoral Research Associateships

The National Research Council announces the 1987 Resident, Cooperative, and Postdoctoral Research Associateship Programs for research in the sciences and engineering to be conducted on behalf of 26 federal agencies or research institutions whose laboratories are located throughout the United States. Approximately 450 new full-time Associateships will be awarded on a competitive basis in 1987 for research in chemistry, earth and atmospheric sciences; engineering and applied sciences; biological, health, behavioral sciences and biotechnology; mathematics; space and planetary sciences; and physics. Most of the programs are open to both US and non-US nationals and to both recent Ph.D. degree recipients and senior investigators. Applications to the National Research Council must be postmarked no later than January 15 (December 15 for NASA), April 15, and August 15, 1987. Initial awards will be announced in March and April (July and November for the two later competitions) followed by awards to alternates later. Information: Associateship Programs, Office of Scientific and Engineering Personnel, JH 608-D2, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418. Phone: (202) 334-2760.

Recent Doctoral Graduates Eligible for New DOE Fellowship

The US Department of Energy's Office of Health and Environmental Research has established the new Alexander Hollaender Distinguished Postdoctoral Fellowship Program to provide support for outstanding recent recipients of doctoral degrees in conducting OHER-supported energy-related research in the life, biomedical, and environmental sciences.

Fellows will receive a stipend of $35,000, and appointments will be made at participating DOE laboratories and approved university laboratories.

The first appointments are scheduled to begin in the spring of 1987. The application deadline is January 20, 1987. Information: Hollander Postdoctoral Fellowships, University Programs Division, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117. Phone: (615) 576-3190.

NIH Appoints Deputy Director

William Raub has been appointed NIH Deputy Director, following the recent retirement of Thomas Malone. The appointment was approved by HHS Secretary Bowen on August 24. Malone had held the number-two spot at NIH since 1977. He retired August 1.

(Continued on p. 219)

Centennial Symposia Preview
March 29–April 3, 1987
Washington, DC

A Century of Progress in Physiology

Lung Development: Cells, Matrix, and Interactions

Chairman: J.S. Brody. *Speakers:* P. Ekblom, J.S. Lwebuga-Mukasa, M.J. Bissell, J.S. Brody, and D.J. Massaro.

This symposium will cover the topic of lung development from the cell biologic point of view, focusing on cell and tissue differentiation, matrix production, and the interaction of cells with matrix. Two speakers will discuss matrix control of differentiation in nonlung systems focusing on basement membrane and collagen effects on tissues or cells. Lung-related topics will concentrate on late fetal and early postnatal events associated with cell and matrix differentiation. Included will be discussions of basement membrane effects on alveolar epithelial cell differentiation, markers of epithelial and interstitial cell differentiation during perinatal lung, and modulation of developmentally regulated proteins, including an endogenous lung lectin, during postnatal alveolarization. Attempts will be made to draw analogies between lung and nonlung systems and to emphasize basic principles of cell differentiation and matrix interaction.

Physiology of Skeletal Muscle: History and Mysteries

Organizer: R.S. Eisenberg. *Speakers:* C.F. Armstrong, W. Almers, E. Rios, H.E. Huxley, and A.F. Huxley.

The voluntary motion of animals has intrigued scientists forever, i.e., for a longer time than the word "scientist" has existed. Voluntary motion is such a distinguishing attribute of animal life that its mechanism has been studied with the most advanced technology available for centuries. Our time is no exception. The progress of work in the last decades has been amazing. The subcellular structure of skeletal muscle fibers was revealed (to most scientists) in the 1960s. The symposium talk on structure will address issues concerning the location of functionally significant molecular structures. Skeletal muscle is an electrical organ of the most vivid kind, studied as such from the beginnings of electrical science. This symposium will describe the electrical properties of skeletal muscle and show how they arise from the membrane and protein structure of the cell. The role of the electrical properties of muscle—to coordinate and control contraction—was only realized some 40 years ago. Today, the membranes of most (if not all) cells are known to control their inner functions, serving as the link between the extracellular environment (and thus other cells and tissues) and the internal milieu. The internal and external membrane systems responsible for these functions have been best studied in skeletal muscle, and one of the talks will discuss the still frustrating gaps in our knowledge of how these membrane systems work. The final aspects of this symposium will deal with functional aspects of muscle, namely contraction. Thanks to the two final speakers, we learned in the 1950s where to look for the molecular basis of contraction, namely in the crossbridge of the myosin molecule and its receptor on the actin molecule. Since then, the molecular basis of muscle movement has been within our reach but not our grasp. Now that the community of physicists have built sufficiently bright sources of X-rays, we are nearly ready to watch the crossbridges in action. One of our talks will tell just how close we are. More traditional physiological approaches—improving preparations and instrumentation—have been applied with great energy and success in the last decades, seeking to measure the shortening and tension of a single crossbridge.

The Nerve Impulse: From Conduction to Channels via Conductance

Organizer: R.S. Eisenberg. *Speakers:* R. Frank, J. Rinzel, C. Armstrong, R. Stroud, and R. Eisenberg.

This symposium will review the history and thereby describe the present status of the neurobiology of membranes. The last 50 years has seen the most remarkable progress in the understanding of the nerve impulse, the fundamental signal that carries all long distance communication in the nervous system. Fifty years ago physiologists tried to study conduction, the process by which the impulse moves along nerve fibers. They failed, to be followed several decades later by successful mathematical theories. Rather, physiologists succeeded in understanding the electrical currents that produce the nerve impulse, by studying the systems—the conductances—that conduct ions across the nerve membrane. These systems have eventually been shown to be protein molecules called channels, which now can be studied by the powerful techniques of protein chemistry, channels as proteins, even enzymes.

Body Fluid and Electrolyte Distribution During Thermal Stress

Chairman: R.S. Elizondo. *Speakers:* V.A. Convertino, M.N. Sawka, S.M. Fortney, and R.S. Elizondo.

Regulation of body fluids and electrolytes during thermal stress continues to be a subject of great interest. An effort will be made in this symposium to review the current information relevant to this topic. The symposium will consider the present state of knowledge of the fluid and electrolyte responses of humans and other primates to both heat and cold stress. The specific effects of variables such as age, sex, and exercise training will also be considered in detail. The physiologists invited to participate in the symposium were chosen because of their recent significant contributions to this interesting dynamic physiological topic.

Control of the Pulmonary Circulation

Chairman: A.P. Fishman. *Speakers:* K. Johansen, E. Weibel, I. McMurtry, K. Brigham, M. Peach, and S. Cassin.

Recent advances in cell biology and integrative physiology have broad implications for those interested in the control of the pulmonary circulation. This symposium is organized to provide a broad perspective of current understanding and to depict the leading edges of contemporary research. Against a background of the comparative biology and functional anatomy of the pulmonary circulation, mechanisms underlying vasomotor activity will be considered. The applicability of the fresh concepts will be illustrated with respect to the transition from fetal to neonatal life.

The Founding Fathers of the American Physiological Society

Chairman: D.L. Gilbert. *Speakers:* T. Appel, A.C. Barger, W.B. Fye, S. Ochs, J. Hoffman, and G.L. Geison.

Since this is the Centennial Celebration of the American Physiological Society, it seems appropriate to understand the reasons why the Society was founded. A necessary prerequisite for the formation of any lasting group is the presence of a critical mass of individuals who share a common interest. Toward the end of the nineteenth century, American science had progressed sufficiently to provide such a critical mass of scientists in many scientific disciplines. The conditions were ripe for the founding of the various scientific societies at that time. The specific reasons for originating this Society a century ago will be presented. The five founders were Drs. Bowditch, Martin, Mitchell, Chittenden, and Curtis. These five founders will be discussed by five distinguished physiologists or historians of physiology.

Cardiovascular Response to Chronic Portal Hypertension

Chairman: D. Neil Granger. *Speakers:* R.J. Groszmann, A. Blei, J.N. Benoit, R.J. Korthuis, and M. Levy.

The objective of this symposium is to summarize the available data and to identify areas of

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controversy and uncertainty regarding the influence of chronic portal hypertension (CPH) on the cardiovascular system. The cardiovascular response to CPH is often characterized by an increased cardiac output, decreased total peripheral resistance, portosystemic shunting, and hepatic ischemia. The cardiovascular alterations in human cirrhosis will be described and, in this context, relevant animal models of CPH will be discussed. The roles of circulating vasodilators and an altered vascular sensitivity to endogenous vasoconstrictors in producing the hyperdynamic circulation of CPH will be critically analyzed. Finally, the importance of the kidney in the overall circulatory response and the alterations of water and electrolyte balance in CPH will be discussed.

The Basis of Micromechanical Behavior of Lung
Chairman: Fred Hoppin. *Speakers:* J. Crapo, E.H. Oldmixon, S. Schürch, H. Bachofen, R. Skalak, T. Wilson, and E. Weibel.

The highly elastic structure of the mammalian lung manages appropriately to support position and lengthen its airway and vascular trees, to spread and maintain the enormous alveolar surface area for gas exchange, and to distend the airspace with enough uniformity for effective gas turnover. This is all accomplished, while undergoing large changes of volume while maintaining mechanical stability, without jeopardizing lung fluid balance and without requiring substantial work for breathing. The structures responsible for this remarkable performance are a fibrous connective tissue framework and an alveolar lining layer. How the stresses are distributed in the connective tissue framework and alveolar surface lining; what the nature of their interactions are; how the elastic and collagen relate to each other, automatically and mechanically; and how their locations determine stability at a fine level and determine the distensibility of the lung are not fully understood. This symposium brings together anatomists, physiologists, and engineers to address the anatomies and properties of these stress-bearing components. It reviews evidence regarding their mechanical interactions, and it reviews some of the current concepts of the mechanics of this system. The selected participants bring different disciplines, but they are in current active communication, of which this symposium will be a way station.

Control Strategies of Physiological Systems
Chairman: J.C. Houk. *Speakers:* A.C. Guyton, F.C. Grodins, W.F. Ganong, and J.C. Houk.

The speakers will review progress made during the last quarter century in understanding the control strategies that are apparent in the operation of several major physiological systems. Examples will be given of negative feedback, feedforward, and adaptive strategies; these mechanistic strategies will be related to the underlying physiological processes. Common themes present across different physiological systems will be highlighted.

Central Mechanism Controlling Body Fluid Balance
Chairman: Alan Kim Johnson. *Speakers:* A.K. Johnson, R.R. Miselis, L.P. Renaud, A. Sved, and G.L. Robertson.

The maintenance of overall body fluid balance and the distribution of salt and water within the body depends on behavioral, hormonal, and neural mechanisms. The coordination of the various systems involved in hydromineral homeostasis relies on the integrative control exercised by the central nervous system. Over the past decade remarkable progress has been made in identifying the stimuli and afferent pathways by which the brain is "informed" of the hydration status of the body. Similarly, recent years have seen progress in the identification of central nervous system structures and pathways involved in the processing and integration of information derived from systemically generated, hydration-related input. This symposium reflects the efforts of multidisciplinary researchers in the fields of behavior, physiology, electrophysiology, and clinical sciences who are involved in studies using multiple techniques to learn how the brain receives and manages the information related to body fluid balance. Also investigated are the mechanisms that allow appropriate effector systems to be mobilized so that animals acquire water (and salt), minimize undue fluid loss through the action of vasopressin, and to optimize available resources by mobilization of appropriate cardiovascular responses. Of particular interest will be a discussion of human pathological conditions in which body fluid homeostasis has been disrupted (e.g., essential hypernatremia) and what is known about brain regions involved in such pathology.

Role of Oxygen Free Radicals in Myocardial Ischemia and Infarction
Chairman: Robert A. Kloner. *Speakers:* R.A. Kloner, J.M. McCord, K.P. Burton, J.M. Downey, S.W. Werns, K. Przyklenk, and T.J. Gardner.

There is now a host of studies implicating oxygen free radicals as mediators of ischemic damage, especially so-called "reperfusion injury," in several organ systems. About 1.5 million people develop myocardial infarction per year in this country and millions suffer from angina pectoris. Therapy of infarction now includes coronary reperfusion by thrombolytic agents, but such therapy potentially could cause "reperfusion injury" mediated by oxygen free radicals. The purpose of this symposium will be to gather some of the major investigators who work in the field of oxygen free radicals as they relate to myocardial infarction and ischemia. Topics for discussion include *1)* studies that have shown that oxygen free radicals have a direct toxic effect on myocardial structure and function, *2)* that free radical scavengers can reduce myocardial infarct size in some but not all models, *3)* the role of the white blood cell in mediating "reperfusion injury," *4)* the role that free radicals might have in mediating the phenomenon of prolonged postischemic myocardial dysfunction ("stunned myocardium"), and *5)* the role of free radicals in cardiac surgery.

Endogenous Antipyretics
Chairman: M.J. Kluger. *Speakers:* M.J. Kluger, W.L. Veale, J.M. Lipton, S.L. Kunkel, and N.J. Roberts, Jr.

Fever is a host-defense response that occurs in response to most infection, inflammation, and trauma. It has long been known that the height of most fevers is limited (see, for example, DuBois, E.F. Why are fever temperatures over 106°F rare? *Am. J. Med. Sci.* 217: 361–368, 1949), presumably an adaptation to protect the host. Within the past few years several laboratories have discovered endogenously produced substances that may serve as naturally occurring regulators of the magnitude of the febrile response. Some of these endogenous antipyretics may work by direct action on the central nervous system; others may function to inhibit the production or secretion of the protein responsible for fever, endogenous pyrogen, or interleukin 1. The purpose of this symposium is to present an overview of the current status of these endogenous antipyretics.

Sleep-Dependent Changes in Homeostasis: A Systems View
Organizers: Ralph Lydic and Julien F. Biebuyck. *Speakers:* R. Lydic, I. Tobler, R. Verrier, O. Smith, R. Harper, J. Orem, E. Phillipson, C.W. Zwillich, E. Satinoff, C. Heller, R. Berger, P. Parmeggiani, A. Borbely, and A. Hobson.

The goal of this symposium is to create a unique diadactic forum that will demonstrate, from a basic and clinical data base, how the behavioral state of the organism (arousal and sleep) relates to the physiological concept of homeostasis. To achieve this goal, the speakers will describe recent work documenting the significant interactive relationships between the mammalian sleep cycle and the cardiovascular, respiratory, and thermoregulatory systems. There are numerous examples of causal interactions between these three systems. For example, the daily rhythm of core body temperature influences the temporal organization of sleep, but normal temperature regulation is disrupted during rapid eye movement sleep. Specific disruptions of the normal sleep cycle also accompany certain affective disorders. Levels of behavioral arousal and sleep are known to influence cardiac arrhythmias and sudden cardiac death. Finally, there are numerous disorders of breathing that occur specifically during sleep. Considerable evidence, therefore, suggests that these three systems are causally interactive. This symposium will explore these interactions and emphasize the importance of intact, unanesthetized models for studying homeostatic control and specific pathophysiologies.

Satiety and the Stomach
Organizer: Paul R. McHugh. *Speakers:* P.R. McHugh, T.F. Burks, W.G. Hall, T.H. Moran, and E.M. Stricker.

This program intends to focus the attention of physiologists on the dynamic physiological actions of the stomach that are related to food intake and its control. These physiological issues demonstrate the remarkable ability of this peripheral organism to play a role in caloric homeostasis now being defined. The participants all have demonstrated new findings in this area, specifically *1)* how distension of the gastric fundus is registered in the brain stem as an integrated event that provides information to the organism; *2)* the development of the stomach's control on satiety demonstrating its influences and when in development other new influences are added; *3)* the control of gastric emptying in

relationship to the stomach's nutrient contents; *4*) the role of cholecystokinin in both the emptying of the stomach and satiety; and *5*) the control of gastric emptying as well as the response of the hypothalamus to gastric distension such as the secretion of oxytocin.

Approaches to the Teaching of Problem-Solving in Physiology

Chairmen: J.A. Michael and H. Modell. *Speakers:* J.A. Michael, W. Randall, J. Larkin, I. Deyrup-Olsen, R. Meyers, and H. Barrows.

Mastery of physiology by students (whether undergraduate, graduate, or professional) requires the acquisition of a data base of facts and the ability to use these facts to solve problems. A variety of approaches to assist students to become proficient at problem solving have been developed over the years. Many of these have centered on experiences in the laboratory or in small group discussion settings. More recently computer-simulated exercises have been adopted as another teaching tool. Participants in this symposium have been drawn from all three levels of physiology teaching, and each will describe a particular approach to teaching problem solving. In addition, a cognitive psychologist will review recent advances in our understanding of problem solving as a cognitive process and what these advances have to offer the classroom teacher.

Vasopressin and Fluid Balance

Chairman: David J. Ramsay. *Speakers:* P. Bie, A.W. Cowley, B.J. Rolls, P.H. Baylis, J. Verbalis, and D.J. Ramsay.

The purpose of this symposium is to cover the actions of vasopressin in the periphery related to fluid balance. As radioimmunoassays for this peptide have improved, a better understanding of the physiology of vasopressin has been obtained. As the actions of circulating vasopressin in the kidney under physiological conditions occur at low plasma concentrations, this area of investigation is quite new and has resulted in some rather surprising findings. It is becoming clear that the inputs that inhibit vasopressin secretion are often different from those that stimulate it, and an understanding of the integration between these inputs is proving to be of importance in the control of fluid balance. With the rapid evolution of knowledge of the participation of other biological peptide systems, the roles of angiotensin II and atrial natriuretic peptide in the regulation of vasopressin secretion are proving to be of great significance.

Macromolecular Uptake and Transport in Epithelia

Chairman: M. Neutra. *Speakers:* K. Matlin, K. Mostov, R. Rodewald, and M. Neutra.

Epithelial cells conduct endocytosis from two biochemically distinct major plasma membrane domains, apical (luminal) or basolateral, and deliver endocytosed molecules to one of several destinations including the opposite cell surface. This symposium begins by examining the targeting of newly synthesized membrane proteins toward appropriate membrane domains and the maintenance of these domains during transepithelial vesicular transport in a model in vitro system. Next the symposium will consider the molecular signals that may determine the complex itinerary of the specific epithelial receptor for polymeric immunoglobulins that undergoes polarized insertion, uptake, and transepithelial transport. Finally, uptake, sorting, and transport of exogenous molecules will be considered in complex in vivo epithelial systems, the jejunum and ileum of neonatal rodents. Together, these presentations will illustrate physiological, ultrastructural, immunologic, and molecular approaches to elucidating macromolecular transport in epithelia.

Cardiopulmonary-Neuroendocrine Interactions

Chairmen: L. Share and H. Raff. *Speakers:* L. Share, D.S. Gann, S.F. Vatner, H. Raff, L.D. Longo, and R.J. Traystman.

This symposium will cover various aspects of the interactions of neuroendocrine and cardiopulmonary control systems, a relatively new field. The program planned will draw individuals with expertise in cardiovascular, pulmonary, neuroendocrine, renal, and fluid balance fields and allow them to interact. Topics to be covered are as follows. A historical perspective will describe how the cardiovascular and neuroendocrine physiologists first began to interact. It will use the neuroendocrine responses to hemorrhage as a model for this historical perspective. A primarily cardiovascular physiologist will then present new data on the neuroendocrine responses to hemorrhage/hypotension. The neuroendocrine responses to hypoxia/hypercapnia will then be discussed especially as it pertains to common clinical sequellae of chronic lung disease. Neuroendocrine-cardiopulmonary control in the fetus will be the topic of the next section. A potentially perplexing topic that has remained studied for too long is the control of blood flow to neuroendocrine organs; it will be covered in the next section. Finally, there will be a general discussion that will hopefully highlight future areas of controversy and research.

Automatic Control of the Peripheral Circulation in Humans

Organizer: L. Rowell. *Speakers:* J. Halter, G. Wallin, P. Vanhoutte, A. Mark, F. Abboud, L. Rowell, and C.J. Mathias.

The symposium provides a timely review of current research on autonomic control of the peripheral circulation in humans, pointing to some essential regulatory features that are unique to humans. The symposium will discuss circulating levels of norepinephrine (NE) and regional NE turnover rates as a means of assessing overall sympathetic nervous activity (SNA). Recent direct electrical recordings of SNA in humans with spinal cord injuries, for example, teach about central organization of SNA, and these examples are later extended to cover consequences of disturbed autonomic function in orthostasis. Rapidly expanding knowledge on nonadrenergic mechanisms (e.g., peptidergic, purinergic, etc.), role of cotransmitters, and so on is reviewed. A synthesis of autonomic control is provided by examining unique features of major homeostatic reflexes in humans, including interactions between arterial and cardiopulmonary baroreflexes, the role of arterial chemoreflexes in health and disease, and cardiovascular control during exercise with analysis of importance of baroreflexes versus peripheral chemoreflexes. Finally, a uniquely human stress—orthostasis—is viewed in those with and without intact autonomic control.

New Roles for Oxytocin

Chairman: Willis K. Samson. *Speakers:* C.A. Pedersen, J.G. Verbalis, D.M. Gibbs, W.K. Samson, and C.P. Fawcett.

Other than its effects in the breast and reproductive tract, little is known about the biological activity of oxytocin. Indeed, although present in both the male and female, its hormonal actions are remarkably poorly understood. Recent technical advances have enabled researchers to identify possible sites of action of oxytocin and to quantitate its effects, and it is now clear that oxytocin can exert potent effects on behavioral and endocrine events. Convincing evidence that oxytocin plays important roles in maternal and reproductive behaviors and in the control of appetite and food intake indicate potent brain actions of the hormone. Elucidation of its ability to modulate anterior pituitary and endocrine pancreatic secretion has provided promising new insights as well in the biological activity of oxytocin. The purpose of this symposium is to reawaken interest in this seemingly lost hormone, to attempt to integrate its actions within the central nervous system, anterior pituitary, and periphery, and to discuss its potential for experimental and therapeutic usage.

Smooth Muscle: From Membranes to Crossbridges

Organizers: Marion J. Siegman and Avril V. Somlyo. *Speakers:* A.V. Somlyo, D. Warshaw, T. Butler, D. Hartshorne, J. Stull, R. Murphy, H. Kuriyama, J. Singer, C.Y. Kao, R. Casteels, F. Fay, and A.P. Somlyo.

This symposium will address the major milestones of recent progress that have been made toward an understanding of the physiology of smooth muscles. As integral parts of organs whose function is to maintain homeostasis, smooth muscles are essential to processes as important and diverse as the control of blood flow and pressure, gastrointestinal and genitourinary functions. The topics included in this symposium focus on properties of the plasma membrane of smooth muscle cells that are responsible for the maintenance of ion gradients and the generation electrical signals, mechanisms by which the contractile process may be initiated by electrical signals at the plasma membrane as well as through intracellular messengers, the contractile process itself in terms of its biochemistry and control, factors involved in the transduction of energy derived from chemical reactions into mechanical output, and mechanical behavior. With a knowledge of the chemical and physical foundation of normal smooth muscle cell functions, the pathophysiological basis of disease can be better understood. Further, the way will be open for the development of pharmacological tools for manipulating these functions, which can ultimately impact on approaches to the treatment of disease states. The speakers are generally acknowledged to be the major protagonists in their fields of expertise and are uniquely qualified to provide, through their presentations and interactions, a perspec-

tive on our current knowledge and, importantly, new directions of inquiry and research.

Frontiers of Technology for Physiologists
Chairman: Andrew P. Somlyo. *Speakers:* N. Unwin, A.P. Somlyo, D. Thomas, D. Trentham, W. Webb, and B. Chance.

The purpose of this symposium is to acquaint biologists with novel biophysical methods and their potential for physiological research. Topics to be covered include cryoelectronmicroscopy of membrane proteins, electron probe analytic studies of subcellular transport in muscle and other cells, digital light microscopy of calcium transients, laser flash photolysis or photolabile precursors of biologically active molecules for studying rapid kinetics of physiological reactions, paramagnetic and optical probe spectroscopies for determining protein orientation, and the use of in vivo nuclear magnetic resonance for following physiological and pathological processes in situ.

The Capillary Function: Historical Perspectives and Future Directions
Chairman: Aubrey E. Taylor. *Speakers:* A.E. Taylor, J.R. Pappenheimer, D.N. Granger, B. Folkow, H. Granger, and C. Crone.

This symposium on capillary function is designed to present both a broad historical review and projections of research techniques and ideas into the twenty-first century laboratory. Three speakers are pioneers in microcirculatory fluid and solute exchange and local oxygen delivery who, along with two outstanding microcirculatory physiologists of the past decade, will present their historical viewpoints, state-of-the-art and future research directions in microcirculatory functional studies.

Regulation of Renal Function
Chairman: David G. Warnock. *Speakers:* P.G. Pauw, A McDonough, F.G. Toback, V. Schuster, and D. Warnock.

This session is intended to review recent advances in the regulation of renal function at the cellular and subcellular level. Special emphasis will be placed on the use of molecular and cellular biologic techniques for the study of regulation of sodium pump activity (Na^+-K^+-ATPase) and of bicarbonate absorptive and secretory processes in both the proximal and distal tubule. In addition, autocrine factors that control cell growth and differentiation in response to changes in the ambient milieu will also be discussed.

Molecular Biology in Physiology
Chairmen: S. Chien and J. Gargus. *Speakers:* S. Chien, J. Gargus, R.R. Kopito, C.W. Flayman, J. Baxter, R.J. Lefkowitz, S. Numa, and E.R. Kandel.

The aim of this symposium is to introduce the modern exciting developments in molecular biology to physiologists working at cellular and organ system levels, so that these new approaches can be applied to physiological research. In the first session the basic concepts and the commonly used terminology in molecular biology are discussed, thus providing individuals with little or no prior knowledge the fundamental information that would allow them to follow the symposium; this session will end with a presentation that illustrates how such background information is applied to elucidate the molecular basis of physiological function in an example system (proton ATPase). The second session consists of four talks on molecular biological research in areas that would interest a broad spectrum of physiologists; there are some degrees of diversity and yet considerable interrelationships. The speakers are selected on the basis of their excellent work in molecular biology as related to physiology and their superb ability as lecturers and teachers; they have depths of insights and knowledge in physiology as well as molecular biology. These speakers understand what the average physiologist's needs to learn from such sessions. It is expected that this symposium will provide the physiologists with an introduction to molecular biology in relation to physiology, thus giving them the impetus to overcome the initial barrier for learning this new subject. Once the physiologist has gained some degree of familiarity with the concepts and terminology that were foreign, it will then be possible to pursue the topic further after returning to one's own institution. The holding of this symposium at the Centennial celebration promises to open up new areas of physiological research by making use of the rapid advances in molecular biology, as we enter into the second hundred years of APS history.

Cellular Mechanisms of Mesangial Cell Contraction
Chairman: D. Schlondorff. *Speakers:* P. Singhal, P. Mene, A. Hassid, J.I. Kreisberg, H. Abboud, D. Schlondorff, and B. Sterzel.

The goal of this symposium is to relate the role of the mesangial cell to the control of glomerular function. To do this, methods for evaluation contractility of cultured cells in response to vasoactive agents will be discussed and correlated with physiology. Specifically, mechanism of action of vasoactive hormones via changes in membrane polyphosphoinositides, intracellular calcium, cyclic AMP, and myosin light chain kinase will be discussed. Interactions of hormones with locally generated autocoids, such as eicosanoids and platelet activating factor, will be stressed. Also, potential effects of interleukins on mesangial cells will be evaluated, as interleukins may also be generated by these cells. Overall, this symposium should provide an overview on the use of modern techniques for cell biology and biochemistry in evaluating the physiology of mesangial cells. This information can then be integrated into the in vivo physiology of glomerular function.

APS Centennial Meeting, Washington, DC
March 29–April 3, 1987

An evening at the Kennedy Center is being planned as part of the APS Centennial program during the FASEB Spring Meeting in Washington, DC.

A block of tickets for Wednesday, April 1, 1987, has been set aside for APS members wishing to attend the performance by the National Ballet of Canada of the *Merry Widow* or the New Orleans Preservation Hall Jazz Band.

To reserve tickets, indicate the performance you wish to attend and return the form with your check by January 15, 1987, to the APS Centennial Office, 9650 Rockville Pike, Bethesda, MD 20814.

An Evening At The Kennedy Center

Name _____
Address _____
City _____ State _____ Zip _____

National Ballet of Canada
8 PM, Opera House
_____ $30.00 each
(No. of tickets)

Preservation Hall Jazz Band
8:30 PM, Concert Hall
_____ $17.50 each
(No. of tickets)

Amount enclosed $_____

PUBLIC AFFAIRS

APS Voices Concern Over AVMA Revision Of Procedures for Animal Decapitation

The American Physiological Society has asked the American Veterinary Medical Association's Panel on Euthanasia to reconsider its recommendation that decapitation by guillotine should be preceded by sedation or light anesthesia or by freezing the animal's head in liquid nitrogen immediately subsequent to severing.

The panel's revision this year of its 1978 guidelines for animal euthanasia alters the procedures for decapitation by guillotine, which was described previously as being rapid and producing instantaneous death and was a recommended procedure for rodents and small rabbits. The guidelines now imply that the guillotine is not humane, as evidence based largely on a 1975 paper suggests that an unanesthetized animal may not lose consciousness for 13–14 seconds after decapitation.

Besides the change in the procedures for decapitation, which the Society believes to be scientifically unsound, there is an additional concern in that the panel's guidelines are also used by the US Public Health Service as its policy for euthanasia of laboratory animals. Thus, small animal experiments where blood and tissue collection is required without prior exposure to sedatives or anesthetic agents may now be halted should institutional animal care committees overseeing federally supported research programs enforce the revised procedures.

Charles R. McCarthy, director of the Office for Protection from Research Risks at the National Institutes of Health, acknowledged that the Public Health Service's policy requires institutional animal care committees to assure that methods of euthanasia are consistent with the current recommendations of the panel. However, deviation from the panel's recommendations is possible if the investigator can justify it for scientific reasons. If a deviation is to be employed only rarely, then the institutional committee may approve such a deviation. A waiver must be secured from McCarthy's office if the deviation is to be frequent or routine.

The Society's Animal Care and Experimentation Committee, which is headed by David J. Ramsay, reviewed the revised guidelines for euthanasia and took its concerns to the APS Council in October. The Council agreed with the committee's findings and unanimously endorsed the recommendation to urge the AVMA panel's immediate reconsideration of its revised requirements for using the guillotine on small animals.

The AVMA panel is composed of six university-based veterinarians, an AVMA staff member, and the executive director of the American Humane Association.

In addition to the Society's letter of concern to the panel chairman, other organizations, including the Society for Neuroscience, American Society for Pharmacology and Experimental Therapeutics, and Association of American Medical Colleges, have voiced concerns about the revised guidelines for decapitation procedures.

Animal Welfare Act Regulations Not Expected Until 1987

Proposed regulations to implement last December's amendments to the Animal Welfare Act are not expected to be published until early 1987. The US Department of Agriculture was to have the new regulations promulgated within 12 months of enactment of the amendments.

The proposed regulations expected to be announced by the Department's Animal and Plant Health Inspection Service will include all changes in the Animal Welfare Act except the provision for exercise of dogs and the environmental requirements for nonhuman primates. Those regulations are expected to be announced at a later time.

Once the proposed regulations are published, a 60-day period will be granted for public comment.

Animal Rights Activists Petition for Rehearing Denied by Court

A federal appeals court has rejected a petition from three animal rights organizations and seven activists who sought a rehearing of the court's decision denying them recognition of having standing in the court.

The animal rights advocates were denied standing in September when the 4th Circuit US Court of Appeals in Richmond upheld a Federal District Court decision that neither animal rights organizations nor animal rights activists have the right to file civil suits on behalf of laboratory animals. Standing is granted by the court to organizations and/or individuals who can show that they have a stake in litigation as plaintiffs.

The petition objected to the opinions of the court and requested a rehearing of the issues by the same three-judge panel that rendered the appeals court decision. With the appeals court rejection, the last remaining avenue to gain standing lies with the US Supreme Court.

The organizations seeking standing are the International Primate Protection League, People for the Ethical Treatment of Animals, and Animal Law Enforcement Association. These organizations and the seven individuals are seeking standing so that they can sue for custody of the 15 monkeys confiscated by police in September 1981 in a raid on the laboratory of Edward Taub at the Institute for Behavioral Research in Silver Spring, MD.

The monkeys, property of the Silver Spring institution, were maintained by the National Institutes of Health under an order by a Maryland court until last summer, when they were transfered to the Delta Regional Primate Center in Louisiana.

APS was one of six scientific societies that led in the submission to the appeals court an amicus curiae (friend of the court) brief stating the issues involving the granting of standing to animal rights activists. A total of 69 scientific and educational associations signed in support of the brief.

One of the corners of the scientific and educational communities in this case is that the granting of standing would give the animal rights advocates a guardianship status over laboratory animals wherein the advocates could file civil suits against university and commercial laboratories for any alleged animal abuse.

William M. Samuels, CAE

EDITORIAL

(*Continued from p. 206*)

Society to reflect on physiology's origins in England, France, and Germany. The closing lecture by Sir Andrew Huxley is scheduled for Thursday, April 2, at the National Academy of Sciences. However, the celebration will not be a celebration without the membership's approval of the above proposals. Then, the week of March 29 will truly become a celebration of physiology's productive past and its exciting future.

Martin Frank

APS NEWS

Bowditch Lectureship Nominations Requested

The annual Bowditch Lectureship in honor of the first elected President of the American Physiological Society, Henry Pickering Bowditch, was established in 1956. The lecturer is selected from among the members who have done outstanding work and are under 40 years of age. Funds for an honorarium are given by the Society. The lecture is given as a formal presentation at the Fall meeting of the Society. The first Bowditch Lecture, titled "Role of the red blood corpuscles in the regulation of renal blood flow and glomerular filtration rate" was given in 1956 by John R. Pappenheimer of Harvard Medical School. A prize of $1,000 is awarded, plus expenses.

The purpose of the award is to stimulate physiological research by young investigators by recognizing those who are outstanding.

There are no restrictions on institutional affiliation; however, a candidate must be a member (any category) of the Society. The Lectureship shall be awarded for original and outstanding work in the field of physiology. Originality of approach, clarity of data presentation, and the general significance of the results are important criteria. The nominators should clearly state the contributions of candidates to any jointly authored manuscripts and papers, documenting the independence of the nominee's work.

Deadline for receipt of nominations is July 1. Nominations should be accompanied by two copies of letters from two nominators that describe the importance of the candidate's work, the evidence for independent thought, the general significance of the work, and a brief sketch of the candidate's professional history; two copies of each of the papers or manuscripts that documents the excellence of the candidate; and two copies of the candidate's curriculum vitae.

The President will select and notify the lecturer and announce the selection in *The Physiologist*.

The lecturer would be encouraged to publish the lecture as a short review in the appropriate section of the appropriate Society journal.

Howard E. Morgan, Past President, presenting the 32nd Bowditch Lecture Award to Yale E. Goldman at the APS Fall Meeting, New Orleans, LA.

Bowditch Lecturers

1956	John R. Pappenheimer	1972	Felix Strumwasser
1957	Bodil Schmidt-Nielsen	1973	Rodolfo R. Llinas
1958	Arthur B. DuBois	1974	Clay M. Armstrong
1959	Lloyd M. Beidler	1975	Thomas G. Coleman
1960	Carl W. Gottschalk	1976	Jared M. Diamond
1961	John A. Clements	1977	Franklyn G. Knox
1962	T. Hastings Wilson	1978	Joseph B. Martin
1963	Eugene M. Renkin	1979	Joseph H. Szurszewski
1964	Daniel L. Gilbert	1980	Fred J. Karsch
1965	Ernst Knobil	1981	Barry K. Gilbert
1966	David H. Hubel	1982	Kent Hermsmeyer
1967	Peter F. Curran	1983	David R. Kostreva
1968	Eugene Braunwald	1984	William W. Chin
1969	John Urquhart III	1985	Martin C. Moore-Ede
1970	Donald Kennedy	1986	Yale E. Goldman
1971	J. Alan Herd		

37th Annual APS Fall Meeting

The 37th Annual Fall Meeting of the American Physiological Society, held October 5–9, 1986, marked the first step in the revitalization of the meeting through the initiation of a thematic approach. For the meeting in New Orleans, two main themes were developed by the members of the Program Advisory Committee. The first theme, cosponsored by seven APS sections, consisted of four half-day sessions devoted to "Neural Humoral Regulation of Water and Electrolyte Balance." The second theme for the meeting was devoted to "Physiological Limitations to Performance" and consisted of two sessions on "A Comparative Approach" and two sessions on "Operation Everest." An additional symposium consisting of two sessions was also organized on "NMR Spectroscopy as an Investigative Technique in Physiology." David Randall coordinated a workshop on the topic "Integrative Study in Physiology and Medicine" that was based on a medical case history appearing in the *New England Journal of Medicine*.

The APS was joined by the Society for Experimental Biology and Medicine (SEBM) for our Fall Meeting. The SEBM cosponsored with the Muscle Group a symposium consisting of two half-day sessions entitled "Endothelium-Dependent Modulation of Vascular Reactivity." In addition, SEBM members contributed 61 abstracts to the meeting (22 abstracts from scientists belonging to both Societies).

The APS Local Committee, chaired by Judy Spitzer, actively participated in the planning for the meeting, contributing two symposia entitled "Perspectives in Immunophysiology" dedicated to Nicholas R. DiLuzio and "Pathophysiology of Infection and Trauma." The Local Committee also hosted an open house and reception in the Departments of Physiology at Tulane University and Louisiana State University.

The scientific program for this 1986 Meeting consisted of 1 workshop (3 sessions), 3 tutorial lectures, 14 symposium sessions, and 523 volunteered papers. Including the invited papers delivered in the tutorial lectures (3) and symposium sessions (89), the number of presentations totaled more than 615 scientific reports.

Yale E. Goldman was the 1986 Bowditch Lecturer, speaking on "Probing the Mechanochemistry of Muscle Contraction." On Tuesday, October 7th, Howard E. Morgan presented the Past President's Address on the topic of "The APS As It Approaches Its Centenary Year."

The volunteered papers for the Fall Meeting were contributed predominantly

TABLE 1 **Programming of Volunteered Abstracts**

Section/Group	Slide	Poster	Poster-Discussion	Total
Cardiovascular	28	100		128
Cell & General		21		21
Comparative	12	16		28
Endocrine & Metabolism		56		56
Environmental, Thermal, & Exercise	22	31		53
Epithelial Transport	8			8
Gastrointestinal		15		15
History				0
Muscle		34		34
Nervous System	11	8		19
Neural Control & Autonomic Regulation	12	7		19
Renal	8	15		23
Respiration	32	38	35	105
Teaching				0
Water & Electrolyte Homeostasis		14		14
Total	133	355	35	523

TABLE 2 **Volunteered Papers by Physiological Category**

Category	1985 Papers		1986 Papers	
	No.	%	No.	%
Aging	3	0.44	3	0.57
Cell & General	5	0.74	16	3.06
Comparative	56	8.30	28	5.35
Endocrine & Reproduction	20	2.96	37	7.07
Environmental, Temperature, & Exercise	51	7.56	48	9.18
Gravitational	133	19.70	4	0.76
Gastrointestinal & Liver	21	3.11	15	2.86
Heart & Circulation	100	14.81	126	24.09
Membranes & Transport	22	3.26	14	2.68
Metabolism	10	1.48	12	2.29
Muscle	41	6.07	33	6.30
Neurobiology & Neural Biophysics	35	5.19	19	3.63
Regulatory & Integrative	20	2.96	19	3.63
Renal & Electrolyte	18	2.67	25	4.78
Respiratory	121	17.93	103	19.69
Water & Electrolyte	15	2.22	14	2.68
History	2	0.30	2	0.38
Teaching Materials	2	0.30	0	
Other			6	1.14
Total	675	100.00	523	100.00

from APS members in the United States. In addition, 33 abstracts were received from Canadian members and 8 abstracts from European members. Industrial scientists accounted for 5 volunteered papers, and female scientists "first-authored" 105 papers, or 20% of the papers.

Physiology departments (including physiology/biophysics, physiology/pharmacology, medical physiology, physiology/anatomy) were responsible for contributing 162 papers. Other departments contributing significant numbers of papers include biological sciences (28), medicine (31), surgery (24), pharmacology (17), pediatrics (13), zoology (11), and anesthesiology (9). The remaining volunteered papers (45.6%) originated in 20 other types of departments. Of the volunteered papers, 48 came from scientists in US Government laboratories, predominantly the Veterans Administration. Of the abstracts acknowledging research support, 184 received support from NIH, 28 from the American Heart Association or affiliates, 19 from NSF, 17 from Canadian MRC, and 12 from VA. In addition, research support was acknowledged from 32 other organizations, foundations, and/or companies.

Table 1 shows the programming of volunteered papers into slide and poster sessions based on the various APS sections and groups. The Cardiovascular and Respiration Sections of the Society programmed 128 and 105 papers, respectively, accounting for 44.6% of the volunteered papers programmed. As can be seen, 355 papers or 67.8% were scheduled in Poster sessions and 6.7% in Poster-Discussion sessions.

For comparison with the 1985 Fall Meeting in Niagara Falls, Table 2 shows that the 1986 meeting received 152 fewer volunteered papers. The decrease in volunteered papers probably can be ascribed to two factors: *1)* the July 1986 IUPS Congress in Vancouver and *2)* the participation of the IUPS/Commission of Gravitational Physiology at the Fall 1985 Meeting. Considering these two factors, the 1986 Fall Meeting still provided an excellent opportunity for the exchange of physiological research.

Committee Reports

Education

The Committee convened on December 2, 1985, at Society Headquarters in Bethesda and on April 14, 1986, in St. Louis, in conjunction with the FASEB meeting held there.

In general, in the last two years positive achievements by the Committee have been curtailed by various factors, e.g., awaiting resolution of our association with AV/MD (Audio Visual Medical Marketing, Inc.) and lack of available funding and sufficient interest in pursuing strategies for faculty development in computer literacy.

The Committee's concerns have been focused on the following issues.

1. *Cataloguing computer software.* In 1984, an appeal by APS for contributions of computer software yielded 32 programs. At that time, a subcommittee consisting of H. Hempling, H. Modell, and C. Rothe was appointed to seek further responses. A new questionnaire published in the June 1985 *Physiologist* generated 27 responses—about half from people who authored software and half from people interested in using it. It became obvious that APS does not have sufficient data to set up its own data base through FASEB. Instead, it was advisable to put respondents to the APS questionnaire in touch with associations that have amassed large data bases. In 1986 the National Resource for Computers in Life Science Education was established by H. Modell, a former member of the Education Committee. This nonprofit organization lists as one of its goals promotion of the development of software, thus potentially fulfilling existing needs.

2. *Marketing of slide/tape programs and development of new products.* Negotiations between Martin Frank on behalf of APS and Jan Robinson of AV/MD were not encouraging for further development and marketing of more "state of-the-art" products, e.g., cassettes for educational use. In view of this and other disappointing past experiences with AV/MD, e.g., reneging on contractual arrangements, the Committee urges the exploration of other avenues for such needs. In fact, Dr. Frank has been negotiating with another outfit for bringing out the cassette series on Aging that Paola

1986 APS Fall Meeting Support

The Society gratefully acknowledges the contributions received in support of the Fall Meeting, New Orleans, LA, from the following:

- Jo Ellen Smith Baromedical Research Institute and the Clinical Department of Emergency and Hyperbaric Medicine/Jo Ellen Smith Medical Center, New Orleans, LA
- Ayerst Laboratories Research, Inc.
- CIBA-GEIGY
- International Business Machines Corporation
- McNeil Pharmaceutical
- Pfizer, Inc.
- U.S. Army Medical Research and Development Command

Timiras produced and that already has been through a rigorous editorial review by members of the Education Committee and Dr. E. J. Masoro.

With respect to the sale of slide/tape programs, Orr E. Reynolds indicated in the past that Spain and Holland might be possible markets; the Committee urged Dr. Frank to explore the possibility of developing markets in these and other European countries.

3. *Faculty development in the use of computer simulation and interfacing "wet labs" with computer-based education.* Potential fund-raising mechanisms for developing faculty and student workshops in this area were discussed. H. Hempling considered writing a grant proposal; however, he lacked seed money to organize a workshop to demonstrate feasibility and serve as a preliminary accomplishment. H. Hempling and F. Abel investigated the potential for developing such workshops and found very little interest or enthusiasm in this regard. The project was dropped.

The Committee recommended that Martin Frank explore the feasibility of Dr. Rhoades (Indiana) or Dr. J. Michael (Chicago) holding workshops at APS meetings for computer-literate faculty in the use and development of computer software.

With respect to combining "wet-lab" experience with computer simulation in teaching, there seems to be no readily available solution at this time.

4. *The future of graduate training in physiology. Systems physiology vs. molecular biology.* Members of the Education Committee share a deep concern about this issue and considered various ways in which we could help in showing the viability and importance of physiology by incorporating cellular and molecular information integratively with organ-level approaches. J. Spitzer suggested developing symposia on themes with the levels of approach going successively from the subcellular to the clinical (or vice versa). W. Spielman suggested refresher courses on topics such as the use of recombinant DNA or monoclonal antibodies in attacking problems in physiology.

5. *Publication of educational articles.* The Committee members uniformly deplore the loss of *The Physiology Teacher.* Paul Johnson, chairman of the Publications Committee, attended our meeting in St. Louis in April to discuss alternative ways of publishing articles of educational content. All Committee members present agreed that the articles should be peer reviewed. A supplement to the August issue of *The Physiologist* was suggested by Dr. Johnson and previously also by Steve Geiger as a suitable place for publication. This seems appropriate, since the projected number of peer-reviewed publications is about half dozen. The mechanism of the necessary peer-review process is currently under discussion with the Publications Committee.

Judy A. Spitzer, Chairperson

Liaison With Industry

At a meeting on April 16, 1986, in St. Louis, MO, the Committee considered the following items.

1. *Committee objectives 1986–1987.* A. Career opportunities. At the Council meeting held in October 1985, Committee Chairman Norman Marshall reported that the Liaison With Industry Committee (LWIC) expressed interest in developing a program to make visible career opportunities for physiologists in industry. In continuation of this effort, Stephen Flaim and Alan Lefer were appointed cochairmen to determine what opportunities exist in industry for regular employment, summer employment, minority physiologists, and physiologists seeking fellowships.

The information gathered will, hopefully, be publicized in a career opportunity folder. Drs. Flaim and Leffer were also asked to consider organizing and recommending to the Program Advisory Committee a program for a Spring Meeting that would elaborate on careers for physiologists in industry.

B. Speakers bureau. On previous occasions, the LWIC discussed the possibility of organizing a speakers bureau to provide speakers from industry "to present the results of their current scientific efforts to local universities with relatively active training programs." Although discussed frequently, there appears to be less than enthusiastic support from industry. Scientists in industry apparently have other opportunities for presenting their research, e.g., at scientific meetings or by invitation from colleagues in academe. Nevertheless, we will solicit the interest of APS members employed by industry in conducting a seminar, by invitation from their colleagues in academe. If such a program were initiated, we would need to determine the source of financial support for speakers' expenses.

C. Information source. A third suggestion concerned identifying individuals in industry who could serve as an information source for physiologists in academe. The purpose would be to be certain that requests to industry about career opportunities, collaborative research projects, and sharing of equipment are forwarded to appropriate individuals. The LWIC agreed to elicit this information from our Sustaining Associates and from other corporations. The device to disseminate this information is an unresolved matter at this juncture.

2. *Program advisory committee.* During discussion of the function of the Program Advisory Committee, Dr. Gisolfi reminded the LWIC that it was encouraged to send a representative to make proposals and to comment on section proposals as well. He expressed his viewpoint that an industrial perspective would be valuable as the program is developed. Stephen Flaim was appointed the LWIC representative to the 1987 Program Advisory Committee and was asked (vide supra) to propose a program that would provide detailed information about careers for physiologists in industry. Although the Program Advisory Committee has already met to select the 1987 Spring Program, we hope that there may be some mechanism to include a LWIC-sponsored career opportunity session for the Centennial Meeting. Incidentally, we intend to communicate our intentions to Dr. Richard Traystman, chairman of the Career Opportunity Committee, in order to interdigitate the LWIC effort with his committee.

3. *Centennial endowment fund.* The last subject discussed was the Centennial Endowment Fund. We have achieved encouraging progress to provide an endowment of $250,000 to support APS Spring and Fall meetings in perpetuity.

Although initiated by the LWIC, the Endowment Fund has been spearheaded by Martin Frank.

Norman B. Marshall, Chairman

POSITIONS AVAILABLE

Cardiopulmonary Sciences/Respiratory Therapy Faculty Position. The University of South Alabama is seeking a Ph.D. physiologist with an emphasis in the cardiovascular area to assist in the development of its cardiopulmonary/respiratory therapy baccalaureate degree program. The faculty member will be expected to teach and to develop and to maintain an active research program. Interested persons should send curriculum vitae and names of three references to William Wojciechowski, Chair, Cardiopulmonary Sciences, Allied Health, USA Medical Center Campus, 2451 Fillingim Street, Mobile, AL 36617. Deadline: January 31, 1987 or until filled. [EOAEE]

Research Associate Awards. The advent of the Shuttle Program has produced a new era for space biology that offers exceptional opportunities for research. NASA is offering several Research Associate Awards for scientists to work in laboratories capable of providing scientific advice and facilities relevant to space biology. The awards vary from $18,000 to $22,000 based on experience. They are for a 12-month period with the possibility of renewal. *Proposals are due February 1.* The funding will begin any time from June 1 to October 1. Eligible are postdoctoral U.S. citizens. For information and application forms contact Dr. X. J. Musacchia, Chairman, NASA Award Committee, Graduate Programs & Research, University of Louisville, Louisville, KY 40292; or Dr. Thora W. Halstead, Research Associates Program, Life Sciences Division, NASA Headquarters, Washington, DC 20546.

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.

Cell and Developmental Biology Predoctoral Fellowships. Arizona State University has predoctoral fellowships available on a competitive basis for applicants interested in Cell Biology and/or Developmental Biology. The fellowships include a 12-month stipend and a waiver of out-of-state tuition. In-state tuition may be compensated depending on applicant qualifications. Research and Teaching Assistantship accompanied by waiver of out-of-state tuition are also available on a competitive basis. The Cell and Developmental Biology Group includes 19 faculty with a wide range of research interests and substantial grant support. For further information about the faculty and fellowship application contact the Department of Zoology, Attention Graduate Secretary, Arizona State University, Tempe, AZ, 85287. [EOAEE]

PEOPLE AND PLACES . . .

Claude Desjardins, Ph.D., Professor of Physiology, Institute of Reproductive Biology, University of Texas, Austin, has been appointed Professor of Physiology, University of Virginia, Charlottesville. Dr. Desjardins has been a member since 1970.

Robert E. Taylor, Jr., Ph.D., Professor of Physiology and Biophysics and APS member since 1967, has been named Assistant Vice-Chancellor for Academic Affairs, University of Tennessee, Memphis.

James T. Stull, Ph.D., has been appointed Chairman and Professor, Department of Physiology, University of Texas Health Science Center at Dallas. Dr. Stull, formerly Professor in the Department of Pharmacology, has been a member of the Society since 1982.

APS member **Mi Ja Kim**, Ph.D., Professor of Nursing at the University of Illinois at Chicago, has been appointed Associate Dean for Research and Director of the Office of Graduate Studies in the College of Nursing.

Peter J. Wilkin, Ph.D., has been moved to Purdue University, Calumet, as Chairman of Biological Sciences. Formerly from South Dakota State University, Dr. Wilkin was elected to APS membership in 1980.

APS member **M. Michael Eisenberg**, M.D., has been named Director of Surgery at Lenox Hill Hospital, New York City, effective Oct. 1, 1986. He has been Director of Surgery at the Long Island College Hospital since April 1981. He is also currently Professor and Vice Chairman of the Department of Surgery, Downstate Medical Center, State University of New York.

ANNOUNCEMENTS

(*Continued from p. 210*)

Raub has served as NIH Deputy Director for extramural research and training since 1983 and as Associate Director for five years before that. In his new post, Raub is expected to oversee the allocation of NIH sources and set agency program priorities.

Raub began his career service at NIH in 1966 at the then Division of Research Facilities and Resources, where he served as a health scientist administrator. He received a PhD in physiology from the University of Pennsylvania in 1965. In 1968, Raub became Acting Chief of the special research resources branch within the Division of Research Resources and from 1969 to 1975 headed the division's biotechnology resources branch. He moved to the National Eye Institute in 1975, where he became Associate Director for extramural and collaborative programs, a position he held until 1978.

New AAP Executive Officer

The American Association of Pathologists announces the appointment of Harold Waters as Executive Officer effective October 1, 1986. Kenneth M. Endicott will continue as Executive Officer of UAREP. Both organizations will continue to share staff, facilities, and space.

Dr. Waters comes from NIH, where he was Deputy Chief of the Referral and Review Branch of the Division of Research Grants. He received a PhD in immunology and experimental pathology from UCLA in 1971, served as Associate Scientist of Allegheny General Hospital in 1972–1976, Project Coordinator at the Smithsonian Institution in 1976–1978, and came to NIH as Executive Secretary of the Pathology A Study Section in 1978. In addition to his other duties, he served as Managing Editor of the *Handbook of Cancer Immunology*.

Hypoxia Symposium 1987

The fifth symposium on hypoxia will consider "The Tolerable Limits of Hypoxia." The program will include the following areas: oxygenation at a cellular level, hypoxia in pregnancy, hypoxia in neonates and infants, oxygen transport systems at extreme altitude, central versus peripheral control of fatigue, and tolerable limits of hypoxia in selected animals. Registration information: $275 (Canadian) or $225 (U.S.) if paid by December 1, 1986; $375 (Canadian) or $300 (U.S.) after December 1, 1986 (half refundable if you cancel before January 15, 1987) (50% reduction for non-physician spouses; 50% reduction for special cases on request). Information: Ingrid Ellis, Hypoxia Symposium Registration Coordinator, 1M10, McMaster University Medical Centre, Box 2000, Station A, Hamilton, Ontario, Canada. L8N 3Z5.

APS Plan to Foster the Integration of Molecular and Cellular Biology With Systems Physiology

Rationale

The American Physiological Society is the undisputed leader in the study of integrative physiology. Physiology is the discipline most concerned with the integrative, as compared to the reductionist, view of biology, regardless of the technology used or the level of organization at which a problem is approached. The special challenge for physiologists in the 1980s is the application of techniques drawn from disciplines such as molecular genetics, cell biology, and immunology to the development of new knowledge at the systems level. This requires that physiologists identify and work on major unanswered questions at the systems level while being aware of and making use of the techniques and paradigms of modern biology.

Because of the important role that new research tools will take in understanding function, the American Physiological Society should take the leadership in fostering the integration of molecular and cellular biology with systems physiology. New strategies for the education of graduate students who are knowledgeable of both systems physiology and new biological techniques should be identified and widely dispersed. While the physiology faculty has a major responsibility for the teaching of systems biology essential for medical education, it is also important to interface such teachings with the knowledge on molecular and cell biology the student learns in other courses. Tutorials and workshops should provide physiologists the opportunity to be introduced to new approaches and equipment. This fresh approach to integrative biology should be communicated to funding agencies so that the work of physiologists applying the newest technology will receive adequate peer review. Accomplishing these and other related goals should have a high *priority* for the American Physiological Society during the coming five years. This will require a specific plan of action, some elements of which are listed below.

Plan of Action

1. *The Sections* should be strengthened so that each one can take a leadership role in defining the specific needs of the subdiscipline. Initially, Sections should develop new Bylaws that will allow them to participate more fully in the governance of the Society. The Steering Committee of each Section should work to improve communication among the members by means of newsletters and annual business meetings. The Sections should take increasing responsibility for planning Fall and Spring Meetings, which provide the most outstanding symposia, tutorial workshops, and other activities that will keep physiologists at the cutting edge of their fields. As the strength of the sections increase, they should develop plans to positively influence funding agencies by *1)* creating position papers in needed Requests for Applications and Proposals, Workshops, and other programs (this involves all disciplines, not just molecular and cellular biological areas), and *2)* influencing the selection of study section members to include individuals who will be able to give adequate peer review of grant applications applying the techniques of modern biology to integrative problems.

2. The *Program Committee* should work closely with the Sections and the Education Committee to provide opportunities for Symposia and Workshops that emphasize new methods and paradigms.

3. The *Education Committee* should be given the charge to *1)* develop and disseminate new approaches to graduate education that take into account these goals and the influence that these changes will have on current departments, and *2)* develop tutorials, sessions, and workshops designed to introduce investigators to the use of new technology.

4. The *Long-Range Planning Committee* should be given the charge to refine the plans and develop other strategies to accomplish the overall goals of fostering integration of molecular and cellular biology with systems physiology. This group should work closely with the Association of Chairmen of Departments of Physiology (ACDP) as well as the Council.

5. The *Publications Committee* (or the journal editors) should be encouraged to publish minireviews on subjects that involve integration of molecular and cellular biology with systems physiology.