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EDITORIAL

Effective March 1st

Due to a tightening of the budget, we are forced to curtail our overtime and weekend schedule, and request that all major breakthroughs be achieved as early in the week as possible.

Thanks to Gramm, Rudman, Hollings, and all their congressional cronies, the above caption from a Sid Harris cartoon might become the standard operating procedure for research laboratories throughout the United States. In their infinite wisdom, our elected representatives, many of whom have never seen a pork-barrel project they did not like, have taken the easy way out of the deficit quandary. Effective March 1st, the impact of the Gramm-Rudman-Hollings (G-R-H) law will start taking hold. The cuts mandated by the law will result in $11.7 billion in 1986 spending cuts.

For APS and members of the biomedical community, a major question relates to the potential impact on the research budget. The combined reduction in the NIH, NSF, and ADAMHA budgets is approximately $312 million from the 1986 budget. For these agencies, the problem is whether to reduce the size or the number of new and competing awards. For NIH the answer is easy, since it must comply with a separate statutory requirement mandating at least 6,100 new grants this year. At present NIH is planning to negotiate the size of the awards downward by as much as 16%.

The real crunch will come in 1987, when a cut of more than $50 billion is possible if the Congress and the White House do not reduce the deficit as required by law.

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Ethics of Animal Welfare in Research: The Institution's Attempt to Achieve Appropriate Social Balance

Ernest D. Prentice, Irving H. Zucker, and Andrew Jameton

Introduction

The long-standing conflict between the research community and animal rights groups has intensified over the last several years. In 1981 the animal welfare movement was galvanized by a court-ordered seizure of experimental animals housed at the Institute for Behavioral Research (IBR), Silver Spring, Maryland (3). This action was based on the testimony of an undercover worker representing the animal activist group People for Ethical Treatment of Animals (PETA). It resulted in the arrest of the chief psychologist on charges of animal cruelty and a precedent-setting suspension of grant funds by the National Institutes of Health (NIH) because of questions relating to animal welfare (1). Since the Silver Spring incident, animal rights activists have been involved in an increasing number of legal and illegal activities designed to support their position, which varies from a morally vehement desire to totally abolish the use of animals in research to a more moderate view that the number of animals used in research should be reduced significantly and more stringent animal welfare regulations established.

During the last few years strong lobbying efforts by the animal welfare movement have led to the introduction of over 80 bills in state legislatures. At the federal level several bills were introduced into Congress, which if passed would have significantly limited and controlled the use of animals in research. Two of the most important of these proposals were H.R. 556 and H.R. 6245, which included provisions calling for the reallocation of NIH animal research funds for the development of nonanimal models. In addition, H.R. 556 required the establishment of a federal agency empowered to mandate which methods of research could be employed in federally funded projects.

From 1984 to 1985 many scientific conferences experienced animal welfare protests, and over 20 research centers reported illegal break-ins, vandalism, and theft. Two incidents in particular achieved a great deal of publicity and accordingly generated significant congressional concern. In May of 1984 the Animal Liberation Front (ALF) achieved a "victory" of great significance to the movement when they broke into the University of Pennsylvania's Head Injury Research Center, where they destroyed research records, damaged equipment, and stole videotapes that allegedly document animal abuse (2). After strong protest by members of PETA, the urging of 16 members of Congress, and an NIH investigation, the Secretary of the Department of Health and Human Services (DHHS) suspended funding to the center (4). In April of 1985 the Animal Liberation Front (ALF) claimed responsibility for "the largest animal raid in history" at the Uni-

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According to Reagan's budget, he has solved the deficit problem by cutting the R & D budget. For NIH the 1987 budget only obligates $4.7 billion, which will allow for 5,100 new and competing renewal awards. However, additional resources will be made available to support high-priority, high-quality research by initiating a "Fair Share Allocated Overhead Policy," which will reimburse research institutions for their administrative expenses at reasonable and fair rates.

Gramm-Rudman-Hollings will force a new reality on the research community. Investigators will have to make do with reduced direct costs. Corporations will be forced to become a major source of support if the biomedical research community is to remain viable. Reductions in direct cost allocations of 16% will force many principal investigators back into the laboratory as funds for support staff are cut. The loss of research technicians, etc., under G-R-H will only mirror the situation in NIH laboratories, resulting from reductions in personnel mandated under previous administrations. If biomedical discoveries are to continue, investigators must rouse themselves out of their Rip Van Winkle sleep and communicate with their congressional representatives.

A major consequence of the G-R-H law will be increased pressure on a weakened peer-review system. As paylines have moved from 270 in 1978 to 140 in 1985, cries of cronyism, favoritism, and conservatism have been heard from the unfunded masses. What is the cause of the dramatic shift in the payline? In some eyes, the answer is grade inflation caused by tinkering with the system. However, my 7 years of experience as Executive Secretary of the Physiology Study Sections suggests that there are other causes.

To use another Sid Harris caption, "What do you expect, since 90% of all scientists who ever lived are alive today?" To put it bluntly, the competition is stiff. The '60s and '70s saw our academic institutions churn out large number of PhDs all looking for their first research grant. As it became more difficult to gain support, Darwinian selection took hold and only the strong survived. Instead of looking at the excellent cadre of scientists bred by the competition, the resultant cry has focused on "grade inflation."

While competition has played a role in the receding payline, the release of summary statements to applicants starting in 1978 has also had a major impact. Proposals are no longer revised in the absence of "constructive" criticism but are now revised with the assistance of a complete summary of the review. The quality of the resubmission almost surely improved as did the priority score. With a resubmission rate of 35% or more, scores can go only one way and that is up.

The time has come to look beyond grade inflation and Darwinian selection. If the problem is not the peer-review system, then the problem must be the NIH support mechanism. The G-R-H law is likely to force the issue of whether or not NIH should indeed support the full cost of research.

The argument is often made that NIH funds projects, not people. However, with approximately 70% of direct cost dollars allocated to personnel, it is obvious that people are a major part of the equation. That factor raises a number of significant questions. Should principal investigators, who are often full professors, receive 100% salary support from a grant? Should universities operate as motels, renting space to investigators with grant support and indirect costs? Are universities obliged to provide only token salary support to biomedical faculty while providing 9–10 months of salary in other academic departments? Should principal investigators be reimbursed at salary levels in excess of the level NIH scientists are reimbursed?

While the answers are not easy, the questions will undoubtedly be asked as a result of the G-R-H law. NIH and the other R & D agencies should truly be funding projects, and universities should provide a greater share of the principal investigators' salary support. If the biomedical community is to survive the G-R-H law, we must be willing to answer the hard questions.

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

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versity of California's Riverside campus. Subsequently, PETA displayed stolen laboratory animals on local television and accused University of California researchers of treating animals inhumanely.

Approximately 13 months after the University of Pennsylvania incident, DHHS published the new Public Health Service *PHS Policy on Humane Care and Use of Laboratory Animals* (6). The new policy, drafted over the last 3 years, holds institutions that operate research laboratories funded by the PHS accountable for animal welfare. The policy specifically requires the establishment of Institutional Animal Care and Use Committees (IACUC) responsible for approving the animal experimentation sections of grant applications to the PHS. Although the PHS policy only requires review of proposals seeking PHS funding, it is generally anticipated that most institutions will apply the policy universally without regard to the funding source.

Since the PHS policy was published, hundreds of institutions have begun the task of formulating animal welfare guidelines for their investigators based on the PHS policy and the most recent edition of the *NIH Guide for the Care and Use of Laboratory Animals* (5). This task is formidable, since the PHS policy lacks specificity with regard to protocol review criteria and there is considerable disparity of opinion concerning exactly what constitutes appropriate animal welfare in the research context. This lack of agreement, which extends to scientists, animal activists, and the public at large, is not surprising since the animal use in research issue is fraught with emotionality. It is difficult to remain objective when laboratory animals, often equated with anthropomorphized household pets, are exposed to lethal doses of radiation, operated on, infected with disease, given drugs, and subjected to many other potentially painful experiments carried out in the name of medical research and the benefit of humankind. Questions of moral legitimacy are predictably precipitated by the thought that millions of animals have had cancer induced in them when we know that cancer can be very painful, at least in humans. Pain resarch on animals constitutes an even greater ethical dilemma, since in order to carry out the research the animal must purposefully be subjected to painful stimuli.

On a purely emotional level no scientist or any other reasonably humane individual wants to subject an animal to pain and/or discomfort. Conversely, it is generally recognized that virtually every major advance in health care that we enjoy today stemmed in whole or in part from research involving animals and that in many research protocols there is simply no alternative to the use of live animals. Given our present state of knowledge the continued improvement of human health and well-being is likely to remain dependent on animal experimentation for years to come. Thus, the question of what constitutes the appropriate social balance between the needs of science and animal welfare is an issue that is likely to continue to generate considerable concern and debate. How much, if any, pain can a human ethically inflict on an animal in the name of science? Is there a moral limitation to experimentally induced animal pain and suffering? These questions are at the center of the animal experimentation vortex.

The lack of consensus regarding what constitutes scientifically and socially appropriate laboratory animal welfare will undoubtedly be reflected in the federally mandated IACUC meetings, where committee members will be required to make difficult ethical decisions concerning the use of laboratory animals in the pursuit of knowledge. Ultimately, the advancement of science and the fulfillment of a moral responsibility to animals do not merely depend on the existence of a federal policy but on the decisions of investigators and review committees in response to that policy. It is therefore incumbent on each institution to establish a series of reasonable ethical principles based as much as possible on the needs of both people and animals. These principles should serve as a humanitarian dictum for all investigators, and the IACUC should apply these principles to the protocol review process in a fair, sensitive, and reliable manner. The purpose of this paper is to describe the ethical principles governing research involving animals adopted by the University of Nebraska Medical Center (UNMC).

UNMC Ethics for Animal Welfare

The following are the ethical principles concerned with animal welfare that have been adopted by the UNMC. These principles provide guidance to investigators and serve as the protocol review criteria employed by the IACUC.

1. When live animals are used in reseach or biological testing, there must be a reasonable expectation that such utilization will contribute to the enhancement of human or animal health, the advancement of knowledge, or the good of society. The relative value of the study is a particularly important consideration in potentially painful experiments where there is an ethical imperative that the benefits of the research clearly outweigh any pain, discomfort, and distress experienced by the animals.

2. It is recognized that in many research protocols there is simply no alternative to the use of live animals. Despite this social imperative for animal experimentation, all investigators have an ethical obligation to explore ways in which animals can be partially or totally replaced by other biological or mathematical/computer systems. When a research question can be pursued using reasonably available nonanimal or in vitro models and still result in sound scientific conclusions, the investigator should choose these alternatives.

3. Selection of an appropriate animal model is an important consideration, particularly at a time when alternative models for animal research are being emphasized. It is the investigator's responsibility therefore to select the optimal species for a particular project. In addition, the number of animals utilized in a protocol should be minimized consistent with sound scientific and statistical standards. It is also the investigator's responsibility to consider the source of the animal and ensure that all animals used for experimental purposes are lawfully acquired.

4. When animals are used in a research project the investigator has an ethical obligation to seek the least painful techniques feasible that will allow the protocol objective(s) to be pursued adequately. If a procedure has associated pain, discomfort, or distress, it is imperative that the investigator estimate the probable occurrence, magnitude, and duration of the pain, discomfort, or distress. The investigator should distinguish between acute and chronic pain as well as pain that will be alleviated versus pain that cannot or will not be reduced or alleviated.

5. In potentially painful procedures the investigator must take all necessary steps to assess and monitor pain as well as discomfort and distress. In assessing pain the investigator should use behavioral signs based on the normal behavior pattern of the species under study. In some circumstances physiological parameters may be used (e.g., plasma cortisol, catecholamines, white blood cell counts, and cardiovascular parameters).

6. If a procedure will cause more than momentary slight pain or distress to the animal, the pain must be minimized both in intensity and duration through the administration of appropriate anesthetics, analgesics, and tranquilizers consistent with acceptable standards of veterinary medicine. It should be emphasized that

the requirement for the alleviation/reduction of pain applies not only at the time the procedure is being conducted but also following the procedure until such time when the pain is either alleviated or reduced to an acceptable tolerance level.

7. In no case should potentially painful experiments be conducted on an awake animal while under the influence of a paralytic or curarizing drug without the concomitant use of an appropriate anesthetic.

8. Research in which painful stimuli are used should be so designed as to provide a means of escape from that pain by the animal.

9. It is recognized that in certain research protocols the administration of appropriate anesthetics and/or analgesics will compromise the scientific validity of the experiment. Such experiments must be justifiable in terms of scientific design and value, and the deletion of these drugs should be based on referenceable scientific fact or experimental data and not intuition. In addition, pain, discomfort, and distress levels should be carefully monitored. There is a limitation on the pain to which an experimental animal may be exposed. An animal that is observed to be in a state of severe pain that cannot be alleviated or reduced to an acceptable tolerance level should be immediately euthanized.

10. No animal should be subjected to multiple survival surgeries, except when they are interrelated and essential to the primary research objective.

11. Whenever possible, alternatives to the ID_{50} test should be utilized.

12. Physical restraint procedures should be used on awake animals only after alternative procedures have been considered and found to be inadequate. If a restraint will be utilized the animal should be trained or conditioned to the restraining device, using positive reinforcement, prior to the beginning of the experiment. The restraining device should provide the minimum restraint consistent with the maximum security and comfort of the animal. In addition, the restraining device should provide the animal with the greatest possible opportunity to assume its normal postural and adjustments. Awake animals should not be subjected to prolonged physical restraint.

13. It is the responsibility of the investigator to ensure that adequate postsurgical/procedural care is provided to all animals. This care must meet acceptable standards in veterinary medicine and be provided as long as necessary, including during nonduty hours.

14. Euthanasia is the act of inducing painless death. The proposed method of euthanasia must be consistent with recommendations of the American Veterinary Medical Association (AVMA) Panel on Euthanasia. Accordingly, the following criteria should be employed in choosing a method of euthanasia: its ability to produce death without causing pain; the shortness of time required to produce loss of consciousness; the time required to produce death; its reliability; hazardness to personnel; its potential for minimizing psychological stress; its compatibility with the requirements and purpose of the research; its emotional effect on observers or operators; its economic feasibility; its compatibility with histopathological evaluation; and drug availability and abuse potential. If an animal will not be subjected to euthanasia at the completion of a research protocol, it is the responsibility of the investigator to ensure that the final disposition of the animal is both humane and acceptable.

15. Procedures involving the use of animals should be performed by or under the immediate supervision of an individual with the appropriate qualifications and experience relative to the procedures to be carried out on live animals.

Discussion

At this point in time it is not known whether the new PHS policy will ultimately prove satisfactory to both the research community and, at least, the more moderate animal activists. Undoubtedly, some scientists will resent the mandated IACUC review of protocols, and a number of animal activist groups have already charged that the policy is essentially no more than federal "window dressing." Top officials at NIH and the Office for Protection from Research Risks (OPRR), however, have declared their commitment to laboratory animal welfare and their intention to monitor institutional compliance with the new policy. Certainly, the policy is far less restrictive than a number of pending congressional bills concerned with animal welfare, and the research community has a timely opportunity to both demonstrate and document their efforts to ensure humane use of animals for research purposes.

It is difficult to predict what direction the debate on laboratory animal welfare will take. It may prove impossible to develop a consistent, agreed upon, moderate position that balances the care owed to animals against the need for them in research. Indeed, the ethical debate is loaded with ironies. First, the term "humane use" etymologically anthropomorphizes the care of animals, but if we were to speak of the "beastly care" of animals we would lose in ethics what we gain in ethymological consistency. Second, undertaking the humane care of animals presupposes some notion of the unity of all life. However, the "speciesism" of regarding humans as the only beings worthy of humanity had the advantage of moderate clarity: it was easy to identify and to identify with the objects of care. Indeed, committees may seem to some to be arbitrary in providing protection, as they do, only for vertebrates and not invertebrates. Third, humans consume animals in vast numbers for food, clothing, and other products. Although precautions are often taken for their relatively painless euthanasia, the industralization of their lives has increasingly led to confined and limited environments for their growth and development. This phenomenon takes place on a much larger scale than animal research and could also warrant more thorough ethical inquiry. Fourth, we are assuming tender regard for a limited number of animals in a world context where humans expose themselves to warfare, crime, torture, exploitation, and the ultimate Armageddon of nuclear war.

These ironies will doubtless come into play when committees consider odd and borderline cases in the care of animals. For instance, should animal fetuses be included under the care of the committees? If so, do ethical requirements and considerations vary according to gestational age? What is the difference between inducing a cancer in an animal as distinguished from permitting one to develop and then not treating it? What responsibility do we have for the sufferings of animals bred with particular characteristics that limit their life span or increase their rate of disease? Although we assume a clear responsibility for animals under our direct care, what is our responsibility to animals in the wild? If merely observing animals in the wild is not an intervention in their lives, and tagging animals is an involvement requiring review, might there be borderline cases, such as changing environmental conditions, that raise hard questions?

Concern for the welfare of animals has not been universal in history. There have been times when they have simply been regarded as existing for our use and exploitation. Some philosophers have denied that animals have any feelings or experiences worthy of consideration. Adopting a moderate position on the review of animal care presupposes certain principles. First, we accept that there is a unity in nature and that animals are similar to humans in many ways. Indeed, if we do not presuppose similarity between humans and animals, scientific research on animals for

Academy Committee Hears Public Views on Animal Rights vs. Need

The issue of the rights of animals versus the need to use animals in the laboratory was the focus of an all-day public forum at the National Academy of Sciences.

The forum was the first effort by the Committee on the Use of Animals in Biomedical and Behavioral Research for gathering public input about the use of animals in laboratory research. The committee, sponsored by the Academy's Commission on Life Sciences and Institute of Medicine, is starting a 2-year study to examine public concerns about laboratory animal use and treatment; benefits derived by humans and animals from research with animals; scientific and technical developments that may affect the use of animals for experimental purposes; and effectiveness of current regulatory and self-regulatory or voluntary guidelines for animal care and use.

The committee heard testimony from 55 organizations and individuals of which 37 of the statements were from animal rights groups and humane societies. Included in the 18 organizations speaking for the need to use animals in the laboratory was Francis J. Haddy, who presented a statement on behalf of both the American Physiological Society and the Association of Chairmen of Departments of Physiology.

To ensure that all aspects of laboratory animal needs were included in the presentations by the users of animals, several of the Washington-based organizations divided the areas of concern for presenting testimony. The joint APS/ACDP statement explored the need and current use of animals for educational purposes.

The joint statement examined the recent survey on the use of animals in physiology laboratories. (Survey results were published in the December 1985 issue of *The Physiologist.*) The survey was conducted by Gilbert S. Greenwald following a request to ACDP president George A. Hedge from the Congress's Office of Technology Assessment for such data for use in its publication *Alternatives to Animal Use in Research, Testing, and Education.*

The 14-member committee conducting the 2-year study includes two APS members, Carl W. Gottschalk and Arthur C. Guyton.

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medical purposes altogether lacks any point. Second, this similarity is assumed to extend to expressions of pain and pleasure. For instance, committees reasonably presume that the shrieking and scrabbling of a dog to escape what would be for us a painful stimulus also reflects pain in the dog. Third, we assume that this pain and discomfort matters. Animal pain and pleasure have weight in our moral calculus. This view is found in the British Utilitarians and reflects a general assumption that pain and pleasure, whether human or animal, are basic to ethical reasoning. Fourth, we recognize that we have a responsibility for creatures that we have brought into being or which are under our care. This principle is symbolized by the Eden story. More than wild animals, and like domesticated animals, laboratory animals are creatures of human enterprise. They are experiencing creatures bred and shaped to our will, and we owe them some consideration as products of our invention. Only if at least one of these four major assumptions is overturned, can we expect the need and difficulty of a moderate position to be obviated.

The debate could also be affected by unexpected developments in technology or social values. For instance, we may discover areas of research that do not require animal models, or there might be a move to foster research on humans as a substitute for animal research. Although the best protected of the animals in research, humans have the greatest vested interest and are the least innocent. One could argue with justice that humans should be most often exposed to research directed to human interests, or there could be a falling away of interest in "high-tech" medicine and a switch to emphasis on measures for disease prevention.

The *UNMC Ethics for Animal Welfare* reflects the requirements of the new PHS policy, the needs of the research enterprise, and the institution's perception of what constitutes adequate laboratory animal welfare. As UNMC and other universities gain experience in the interpretation and implementation of the PHS policy and the field of animal welfare expands its knowledge base, the present code of ethics may change. The institution's animal welfare goal should, however, not change until viable nonanimal alternatives exist. A medical research institution has a scientific and social obligation to ensure that meaningful research is carried out, and at least for the present this requires the use of laboratory animals in accordance with the most humane standards possible. It should also be remembered that the use of animals is a privilege granted by society to the experimenter rather than a right.

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"Standing" Issue Brings Unified Effort by Research Community

It appears that a legal action by animal rights groups has accomplished what militant actions have failed to do: to coalesce the research community on an issue concerning laboratory animals.

Since 1979 animal rights groups have conducted 15 raids on research institutions with 7 of the raids taking place within the last 28 months. Other than some voices of concern, the research community, by and large, shrugged off the incidents as nothing more than unfortunate acts of vandalism.

Now a long simmering civil suit that stems from the September 1981 raid and confiscation of 17 monkeys from a Silver Spring, MD research facility has brought the research community together.

At issue is the appeal filed in federal court by animal rights groups seeking standing. In general terms, standing is the recognition granted by a court to private citizens and organizations as plaintiffs with legally protectable and tangible interests at stake in litigation.

The particular case in point is the appeal by the International Primate Protection League, Animal Law Enforcement Association, People for the Ethical Treatment of Animals, and six individuals who are seeking to gain the legal right to sue for the

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custody of the monkeys taken in the Silver Spring raid.

Under a 1981 order from a Maryland court, the monkeys are being maintained at the National Institutes of Health's animal facility at Poolesville, MD.

The animal rights advocates filed a suit in 1982 to gain custody of the animals on the grounds that they (advocates) have a bonding with the monkeys by virtue of weekly visits and by providing fresh fruits, toys, and a television to improve the primates' environment and well-being.

A federal magistrate in reviewing the suit recommended that it be dismissed because animal rights advocates do not have standing in federal court. The recommendation was upheld by a federal district court judge.

The appeal of the magistrate's recommendation has brought together more than a dozen scientific societies and educational associations for the purpose of filing an amicus (friend of the court) brief with the federal court of appeals. Although the animal rights advocates cite 10 reasons as to why their right to sue has been violated by the magistrate, the amicus brief is concerned only with the issue of standing.

The issue is most significant because the granting of standing to animal rights advocates would open the courts to more suits, inasmuch as there would be a legal recognition that animal advocates have a guardian relationship with laboratory animals.

The consequence for academic institutions and other animal laboratories would be in terms of the numbers of suits that could be filed against individual institutions and the adverse public relations institutions would encounter by the filing of such suits.

The federal appeals court is expected to hear the appeal in June. A steering committee to assist in the preparation and filing of the amicus brief has been selected. The committee is composed of the American Physiological Society, the American Psychological Association, the Association of American Medical Colleges, the National Association for Biomedical Research, the National Association of State Universities & Land Grant Colleges, and the Pharmaceutical Manufacturers Association.

Activists in UK Set Bombs at Four Homes

A group in England called the Animal Rights Militia has taken credit for placing bombs outside of the homes of four people who are involved with the use of laboratory animals.

A time bomb was found under the car of a West Sussex salesman who represents a firm that imports and breeds monkeys for sale to laboratories. A similar bomb was found under the car of a London researcher who uses baboons.

A third bomb was found on the front porch of a director of a research laboratory in Harrogate, and the fourth bomb was placed on the doorstep of a university professor in Staffordshire.

No one was injured because police dismantled the bombs before they could be detonated.

Columbia University's Research Funds Suspended

Columbia University has become the first institution to be charged with failing to meet the requirements of the new National Institutes of Health guidelines for laboratory animal care. The result of this failure has led to the suspension of all federal funds for laboratory animal research above the level of rodents.

The suspension of funds has halted research on a variety of projects including research concerned with heart disease, cancer, AIDS, arthritis, infertility, organ transplant surgery, and birth defects.

The suspension of funds followed an on-site inspection by federal inspectors in January. The new guidelines were put into effect last December 31.

The university was cited for deficiencies in four general areas: the number of veterinarians available; the sterility of areas where animals recover from surgery; the housing of dogs under quarantine; and the techniques used to minimize health risks to laboratory personnel.

The suspension will be lifted after the university certifies the deficiencies have been corrected and are approved by federal inspectors.

Tax Reform Bill to Limit Retirement Deductions

The House-approved version of the congressional tax reform bill includes a section that could have severe consequences for many individuals who participate in tax-deferred retirement plans sponsored by nonprofit organizations.

Title XI of H.R. 3838 would limit tax-deferred salary reductions to a maximum of $7,000 annually for retirement plans authorized by IRS codes 401(k) and 403(b). TIAA-CREF retirement program is included in this section.

For individuals who also have an IRA program in addition to a 401(k) or 403(b) retirement plan, the $2,000 maximum contribution to the IRA would reduce the maximum contribution allowed to the other plan by that same amount, providing the $5,000 maximum was contributed prior to any contribution to an IRA plan. However, should a maximum contribution be made to an IRA plan first, then nothing could be contributed to any other tax-deferred retirement plan, thus reducing the annual contribution for all plans to a total of $2,000.

Individuals who are in the $50,000-plus income range are expected to feel the full impact of this section, should it be enacted. Additionally, the tax reform bill, if enacted, is to be retroactive to January 1, 1986, regardless of when it is passed by the Congress.

Persons concerned as to the effects this section may have on their retirement programs should write to their senators.

APHIS Could Be Victim of Gramm-Rudman

The role of the US Department of Agriculture's Animal and Plant Health Inspection Service as the enforcers of the Animal Welfare Act may be nearing an end.

In recent years the Reagan administration has attempted to give this role to states and nonprofit organizations such as humane societies, but the Congress has always blocked such moves.

This year, as in past years, the administration has requested zero funding for federal inspections of animal laboratories.

With the enactment last year of the Gramm-Rudman-Hollings law, a legislative formula devised to reduce the federal deficit, the Congress may not be able to restore funds for this program. The current appropriation for this activity is $4.8 million.

As in past years, APS has joined with other organizations in encouraging the Congress to maintain this federal inspection program instead of giving Animal Welfare Act enforcement powers to states and nonprofit organizations.

W. M. Samuels, CAE

Association of Chairmen of Departments of Physiology Annual Questionnaire Results

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Each year department chairpersons are asked to fill out a questionnaire concerning various aspects of departmental activities. This past year 160 departments received surveys, with 91 responding. Most of the respondents were from the United States, with a few from Canada, Puerto Rico, and Mexico. All averages relating to salaries, stipends, and budgets are in whole American dollars.

Out of curiosity, the amount of extramural research funds has been compared with faculty size and research space. Although there was some correlation between the amount of funding and the amount of space, it was not as dramatic as one might expect.

Results of questionnaires collected over the last 8 years concerning graduate programs has also been included. If one assumes that the number of departments responding has remained fairly constant, it would appear that the number of Ph.D.s granted per enrollment has gradually decreased. As expected, stipends have increased annually, with the institutions sharing more and more in the funding of students.

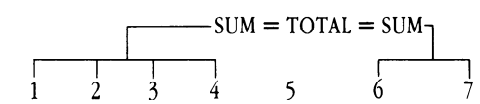
The statistics and tables that follow should be self-explanatory. The bar graphs show the distribution of faculty salaries in thousands of dollars for each of the faculty ranks at the various types of institutions. "Nonmedical" refers to public nonmedical schools (i.e., veterinary, osteopathic, education and research, etc.).

Type of Institution

Physiology department primarily in a medical (83) or nonmedical (8) school. If nonmedical, specify type of school: veterinary, osteopathic, education and research, etc.
Primary affiliation: public (68) or private (23).

Numbers of Faculty with Academic Appointments (Regular or Joint) in Your Department

Numbers in parentheses are average per department. Ninety-one departments responded to the survey. The number of tenured plus nontenured do not add up to the total faculty because these columns were not always filled in completely.



	Degree(s) Held				No. of faculty	Tenured	Not tenured
	Ph.D. only	M.D. only	Both	Other			
Entire salary paid through your department:							
Full time	1,001	82	54	34	1,181 (13)	754	378
Part time	41	11	1	6	58	35	17
Part of salary paid through your department associated with:							
Another basic sci. dept.	33	7	2	0	42	28	10
A clinical dept.	34	15	4	2	55	33	15
No salary paid through your department associated with:							
Another basic sci. dept.	109	3	2	6	120	65	53
A clinical dept.	151	142	31	6	330	142	138
Other (emeritus, volunteers)	137	47	22	16	222	51	96

Unfilled Positions

This represents the total number of positions open in the 91 departments responding:

Professor	9	Associate Professor	18
Assistant Professor	50	Instructor	1

Unfilled positions are due to:

Creation of new FTEs	25	Failure to promote/tenure	8		
Death	7	Retirement	13	Resignation	16	Other	9

Estimated number of junior positions expected to become vacant in the next 5 years due to retirement, new FTEs, etc:

yr 1	39	yr 2	33	yr 3	32	yr 4	27	yr 5	29

Current Graduate Students and Postdoctoral Fellows

Number of graduate students currently enrolled in Ph.D. programs	1,040
Number of postdoctoral fellows currently in all departments	524
Number of vacant postdoctoral positions	59

Training Support

Do you have a training grant that supports predoctoral trainees?	Yes (30)	No (60)
Do you have a training grant that supports postdoctoral trainees?	Yes (31)	No (58)

	Predoctoral	Postdoctoral
Average starting stipend for trainees	$7,244	$16,890
Number of pre- and postdoctoral trainees supported by:		
Training grants?	113	92
Individually federally funded awards?	34	79
Research grants?	229	232
State funds?	285	27
Private foundations?	37	39
Institutional awards?	184	32
Medical Scientist Training Program	23	4
Other? List: Foreign govts.—Mexico, Switzerland, Germany, Australia; NASA; clinical funds; personal funds; military; department endowments.	49	15

Number of Trainees Who Have Finished Doctoral or Postdoctoral Work During Year Ending June 30, 1985

	Doctoral	Postdoctoral
Total number finishing:	113	111
Females	40	19
Blacks	1	2
Other minorities	7	10
Position needed?	1	7
Research area (of those finishing):		
Cardiovascular	19	29
Cell/tissue	14	13
Comparative	1	1
Endocrine	8	8
Environmental	0	0
Gastrointestinal	8	5
General	2	0
Muscle/exercise	9	5
Neural	22	23
Renal	6	3
Reproduction	6	7
Respiration	9	4

Please assess the degree of satisfaction of your graduates in regard to their opportunities in the job market:

Very pleased 6 Pleased 42 Neutral 22 Disappointed 3

Very disappointed 2

How many postdoctoral students are presently taking additional training because they are unable to find a satisfactory position? 47

Average, Maximum, and Minimum Salaries for Each Level

Please note that the maximum and minimum salaries and the maximum and minimum years in position are not related to each other.

Chairmen:	Avg $78,503	Years in position:	Avg 8.6
	Max 122,900		Max 37
	Min 36,000		Min <1

	Professor	Assoc. Prof.	Assist. Prof.	Instructor
Avg	$58,195	$43,336	$33,849	$23,831
Max	128,500	71,283	62,000	33,198
Min	26,600	26,000	18,654	14,386

Average Departmental Budget for Fiscal Year 1985–1986 (Salaries and Operation)

1. Institutional sources	$786,816
2. Outside research grants	1,048,064
3. Training grants	55,507
4. Other budget support	57,728

Identify "other": endowments, private contributions, clinical funds, private practice funds, royalties, MSTPs, RCDAs, private foundations, experimental teaching programs, faculty development funds, VA support, research incentives, indirect cost returns, traineeships, equipment grants, research development grants, computer funds, industrial contracts, and graduate school research funds.

Total $1,960,290

Average Space Assigned to Department (Excluding Lecture Rooms) in Square Feet

Research	12,238	Storage	382
Teaching labs	2,157	Other	1,474
Office space	1,683	Total	19,118

TABLE 1 **Pre- and Postdoctoral Trainees**

	Year							
	85	84	83	82	81	80	79	78
Ph.D.s granted	113	135	153	137	165	190	167	232
Degrees to minorities								
Female	40	42	32	40	41	33	39	13
Black	1	3	2	4	3	7	3	3
Others	7	7	8	9	12	18	10	7
Area of study								
Cardiovascular	19	47	52	25	33	37	31	12
Cell/tissue	14	34	32	26	6	17	10	5
Comparative	1	2	5	2	1	18	1	2
Endocrine	8	50	49	41	38	33	28	13
Environmental	0	8	4	3	1	1	5	1
Gastrointestinal	0	6	5	6	7	3	4	2
General	2	3	29	4	17	11	36	26
Muscle/exercise	9	6	9	6	7	4	6	13
Neural	22	32	31	30	28	45	34	19
Renal	6	9	8	12	11	8	12	6
Respiratory	9	12	8	7	10	7	5	2
Ph.D. students in program	1,040	1,329	991	1,043	1,036	1,060	907	1,040
Postdocs in program	524	534	534	475	493	472	476	482
Vacant postdoc positions	59	64	52	51	53	75	78	59
Postdocs finishing work	111	130	132	147	131	160	109	111
Faculty positions available	78	99	92	84	87	92	97	72
Stipends								
Ph.D. students	$ 7,244	6,600	5,845	5,609				
Postdocs (1st yr)	$16,890	15,634	14,689	14,097				

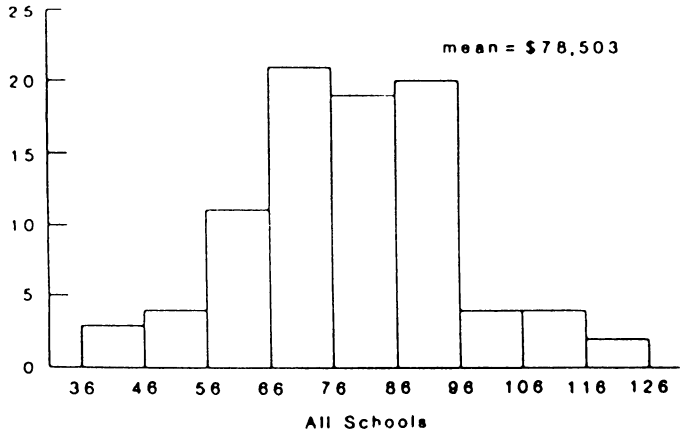
TABLE 2 **Training Support**

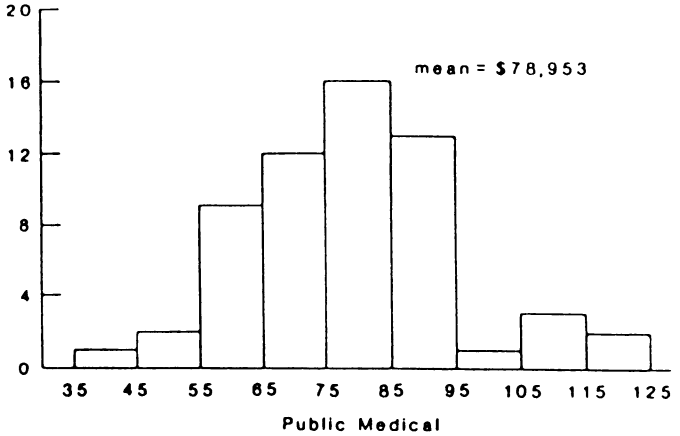
	Total No. of Grants (% total)					
	85	84	83	82	81	80
Predoctoral						
Training grants	113 (12)	177 (16)	189 (20)	149 (16)	159 (19)	177 (19)
Individual federally funded awards	34 (4)	32 (3)	37 (4)	19 (2)	18 (2)	14 (1)
Research grants	229 (24)	248 (22)	223 (23)	241 (26)	206 (24)	237 (26)
State funds	285 (30)	281 (25)	253 (27)	279 (30)	244 (28)	270 (29)
Private foundations	37 (4)	34 (3)	32 (3)	17 (2)	15 (2)	27 (3)
Institutional awards	184 (19)	221 (20)	149 (16)	134 (14)	136 (16)	127 (14)
Medical scientist training programs	23 (2)	46 (4)	22 (2)	33 (3)	28 (3)	29 (3)
Other	49 (5)	75 (7)	46 (5)	63 (7)	52 (6)	43 (5)
Postdoctoral						
Training Grants	92 (18)	89 (22)	100 (20)	110 (24)	98 (22)	112 (25)
Individual federally funded awards	79 (15)	88 (22)	89 (18)	97 (21)	81 (18)	98 (22)
Research grants	232 (45)	130 (32)	197 (40)	174 (38)	185 (41)	155 (35)
State funds	27 (5)	14 (3)	17 (4)	21 (5)	13 (3)	12 (3)
Private foundations	39 (8)	48 (12)	56 (11)	34 (7)	42 (9)	33 (7)
Institutional awards	32 (6)	15 (4)	18 (4)	13 (3)	16 (4)	11 (3)
Medical scientist training programs	4 (<1)	2 (1)	5 (1)	2 (<1)	2 (<1)	4 (1)
Other	15 (3)	18 (4)	12 (2)	11 (2)	9 (2)	16 (4)

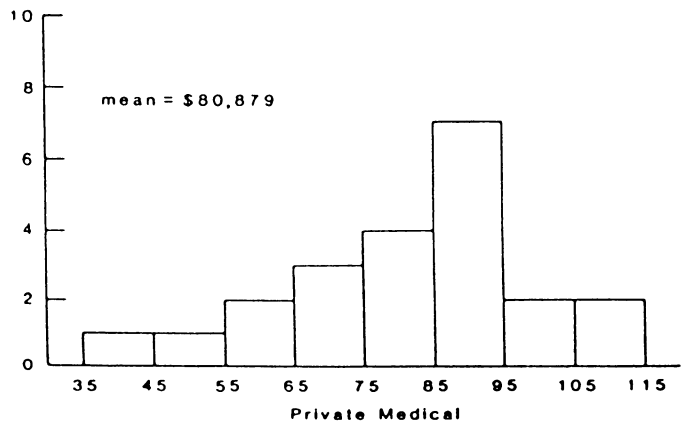
TABLE 3 **Departmental Ranking According to Outside Research Grants**

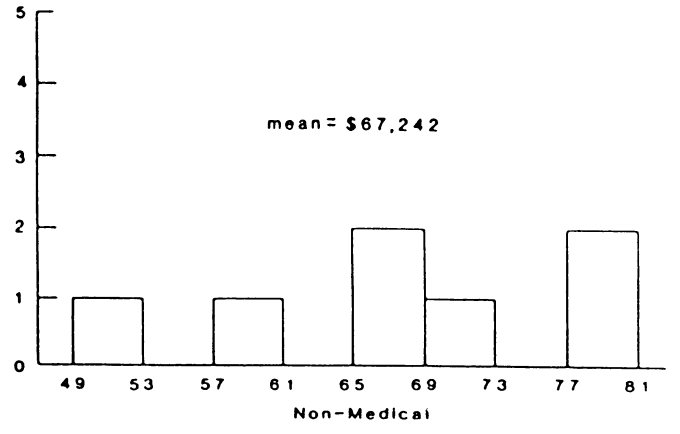
Rank	Grant Income	Grant Income/ Faculty	Research Space, sq ft	Research Space/ Faculty, sq ft	Space Rank	No. of Faculty
Top Ten						
1	$5,011,606	$238,648	19,198	914	14	21
2	3,363,800	168,190	17,481	874	18	20
3	2,748,000	101,779	16,600	615	22	27
4	2,670,532	116,110	18,617	809	16	23
5	2,600,000	162,500	13,961	873	28	16
6	2,450,530	122,526	16,000	800	25	20
7	2,412,635	120,632	19,083	954	15	20
8	2,410,358	141,786	16,732	984	21	17
9	2,404,100	109,277	9,600	436	47	22
10	2,390,606	199,217	16,500	1,375	23	12
Avg	2,846,217	148,067	16,377	864	23	20
Middle Ten						
40	961,410	50,600	11,333	596	37	19
41	961,116	50,855	16,083	846	24	19
42	931,207	93,121	10,000	1,000	44	10
43	907,778	60,518	5,067	338	73	15
44	807,214	62,093	7,770	598	61	13
45	794,947	61,150	10,000	769	45	13
46	794,533	44,141	13,014	723	31	18
47	779,638	59,972	7,676	590	62	13
48	774,400	38,720	12,382	619	34	20
49	770,000	45,294	11,000	647	38	17
Avg	828,224	56,646	10,432	673	45	16
Bottom Ten						
81	112,173	14,022				8
82	105,050	15,007	10,545	1,506	42	7
83	90,000	10,000	3,000	333	83	9
84	72,300	12,050	3,534	589	81	6
85	64,000	12,800	5,121	1,024	51	5
86	61,000	12,200	1,950	390	84	5
87	51,095	6,387				8
88	29,789	5,958	1,755	351	85	5
89	0	0	8,454	939	58	9
90	0	0				3
Avg	58,541	8,842	4,908	733	71	7

Chairmen

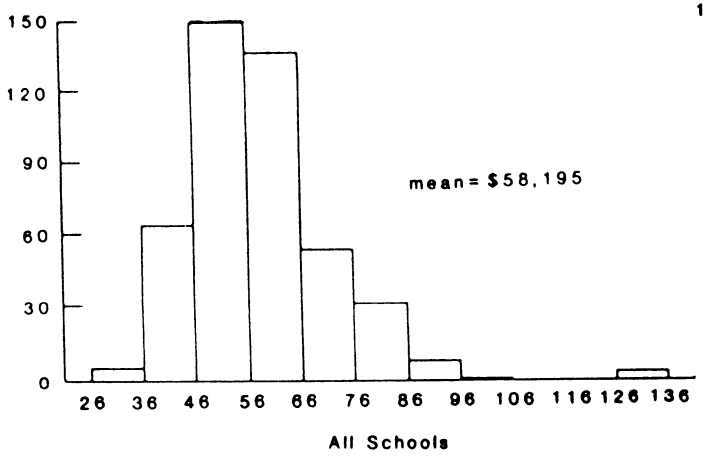


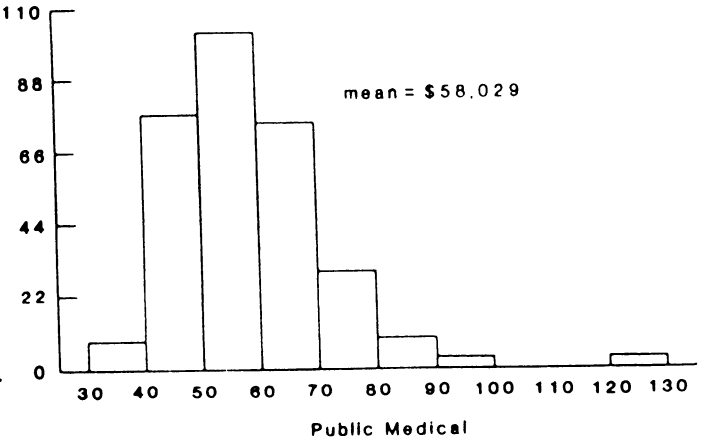


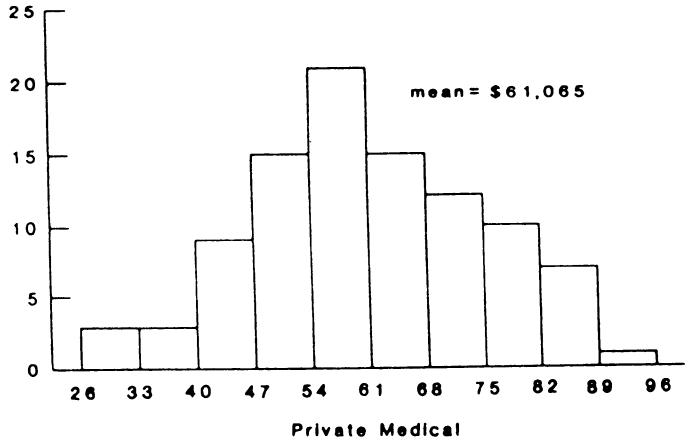


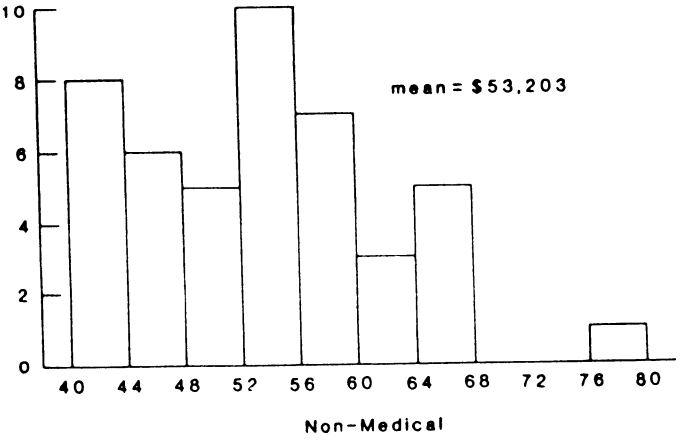


Professors

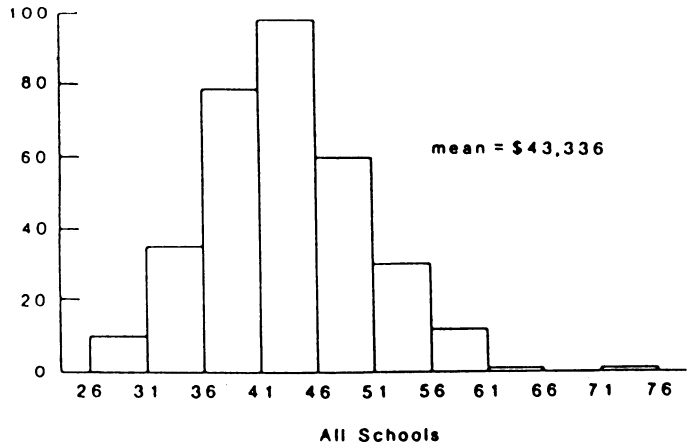


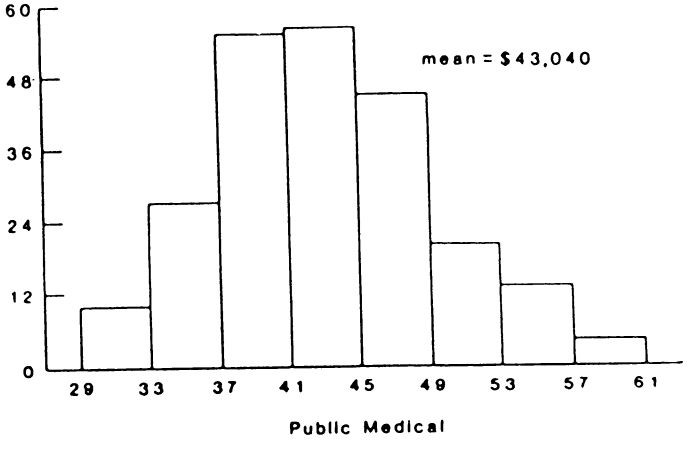


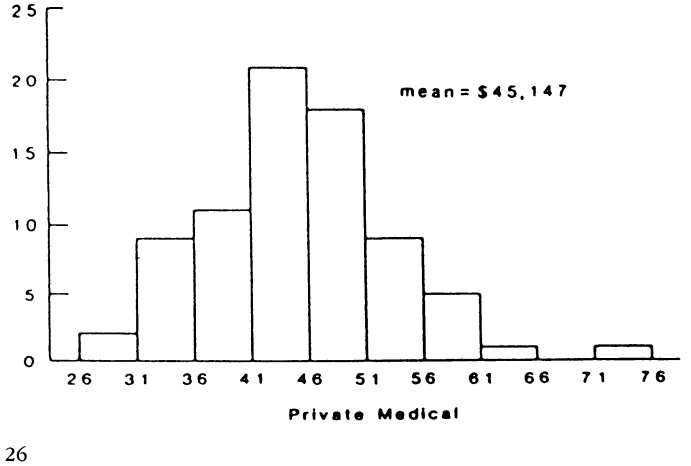


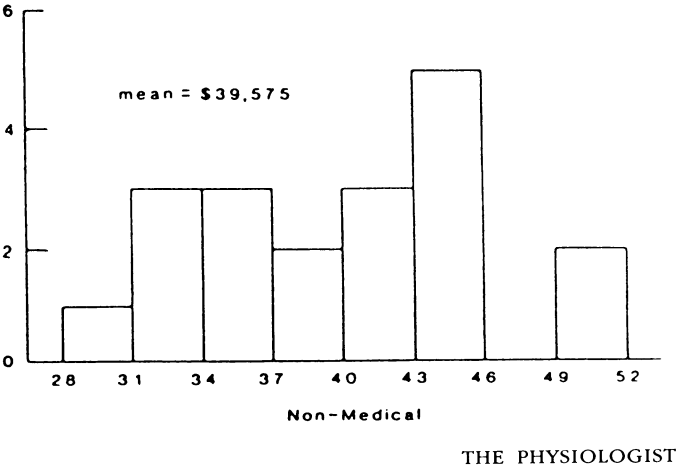


Associate Professors

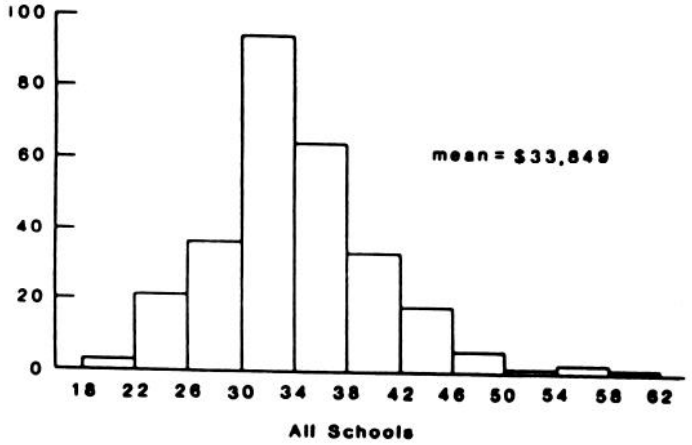


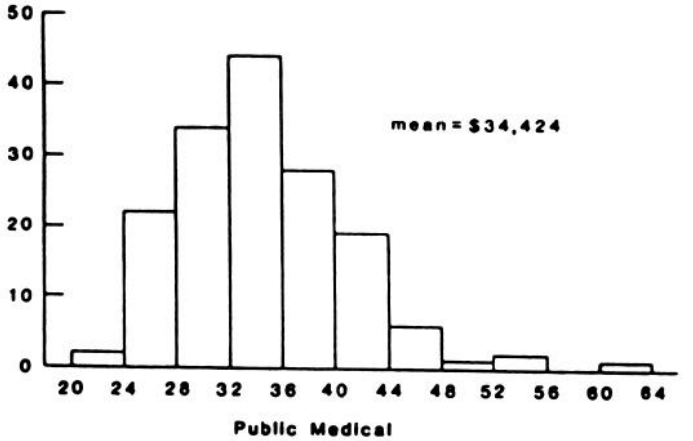


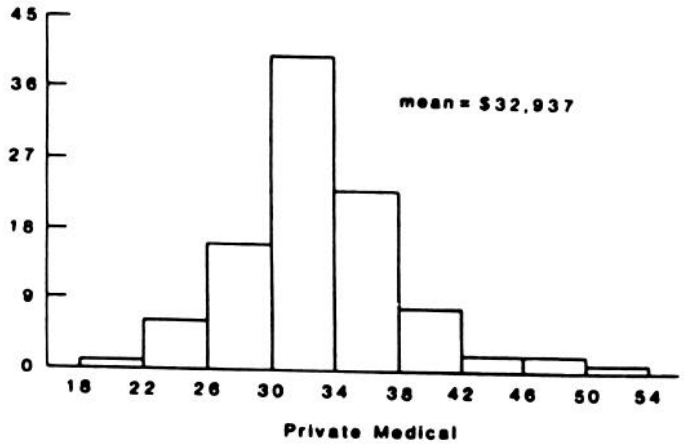


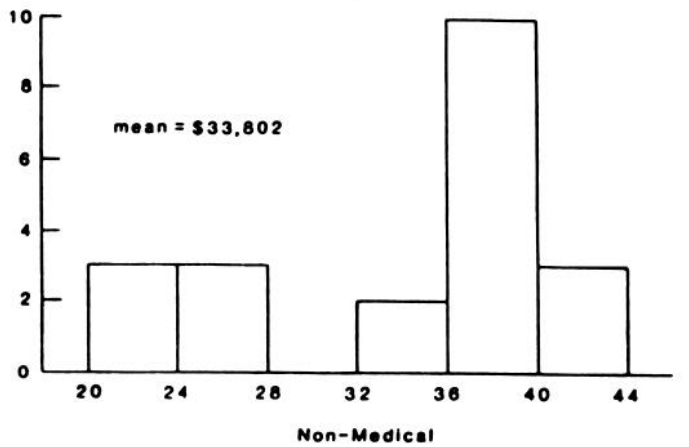


Assistant Professors

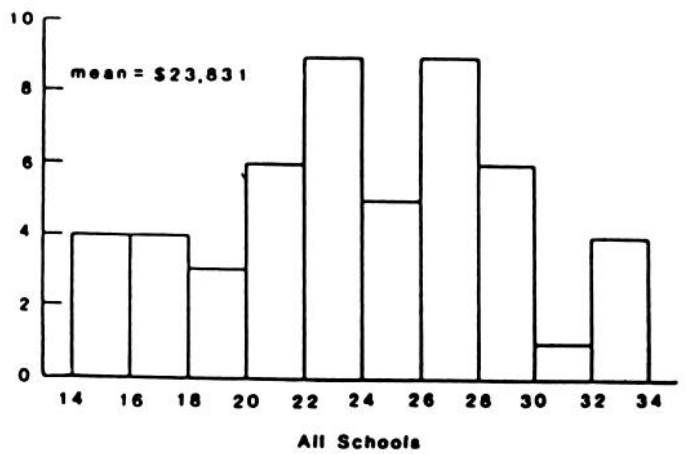


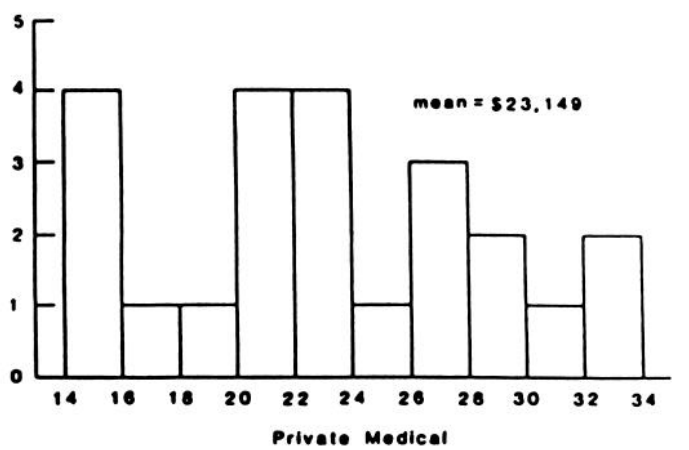


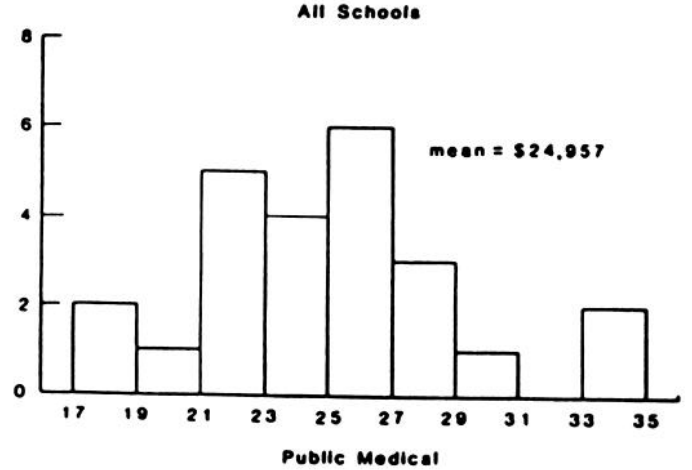




Instructors







APS Membership Applications

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

APS Fall Meeting: New Thematic Approach

The 1986 Fall Meeting of the Society, October 5-9, 1986, holds the promise of being both scientifically and culturally rewarding. APS will be joined in New Orleans by the Society for Experimental Biology and Medicine (SEBM).

This year our meeting will set the stage for the beginning of a new thematic approach to our scientific program. Two theme symposia will pace the scientific sessions.

THEME Symposium I: Neurohumoral Regulation of Water and Electrolyte Balance
Organizer: M. I. Phillips
Session 1: Neuropeptides: Angiotensin and Vasopressin
Chairperson: M. I. Phillips
Session 2: Neural-Humoral Control of Kidney Function
Chairperson: A. C. Guyton
Session 3: Neural and Humoral Mechanisms of Thirst and Salt Appetite
Chairperson: A. Epstein
Session 4: Neurohumoral Regulation of Water and Electrolyte Balance at the Microcirculation
Chairperson: A. E. Taylor

Three tutorial lectures relating to the THEME Symposium I will deal with cellular mechanisms mediating tubuloglomerular feedback control of glomerular filtration rate; cellular and biomechanical mechanisms of renal injury; and cellular mechanisms regulating renin release.

Conforming to the scientific area of THEME I is the workshop "Integrative Study in Physiology and Medicine." The topic of discussion will be a case study of a female patient with diabetic ketoacidosis. R. Alexander, J. Engelberg, D. C. Randall, and R. Vick will focus on the analysis of physiological interactions that are revealed by the course of the disease process.

THEME Symposium II: Physiological Limitations to Performance: A Comparative Approach
Organizers: J. H. Jones and S. L. Lindstedt

The two sessions include discussions on a spectrum of living organisms—from lower forms to human—for comparison of factors involved in their performance during exercise and other physiological functions.

Related to THEME II is a third symposium, organized by J. Sutton on Operation Everest, in which the findings of this research in high-altitude physiology will be reviewed and discussed. Tutorial lectures selected for the THEME II approach include diving physiology; advances in comparative physiology; and current concepts in thermal adaptation.

Two symposium sessions will be "Endothelium-Dependent Modulation of Vascular Reactivity," organized by P. M. Vanhoutte and cosponsored by the SEBM.

"Nuclear Magnetic Resonance Spectroscopy as an Investigative Technique in Physiology" will be the title of two symposium sessions organized by B. M. Hitzing.

Two symposia have been organized by the local committee. N. R. Di Luzio will moderate "Perspectives on Immunophysiology," and J. J. Spitzer will chair "Pathophysiology of Trauma."

In planning for this meeting, the Society has benefited from the diligence and assistance of a local arrangements committee consisting of representatives from Louisiana State University and Tulane University. In addition to organizing two symposia, the committee will host visits to the laboratories and other facilities of the two universities.

Many social events are planned including a riverboat cruise aboard the all-new Bayou Jean Lafitte, featuring an evening of Dixieland jazz.

Member participation in this traditional APS activity will contribute significantly to the enrichment of the meeting and will help pave the way for the Society's second century of progress.

Liakos Named APS Business Manager on Sonnenberg's Retirement

Jim Liakos has been appointed Business Manager of the American Physiological Society, replacing Walter A. Sonnenberg, who retired on March 1 after 20 years of service to the Society.

Liakos has been a member of the APS staff since 1966 and most recently held the post of Assistant Business Manager. Before coming to APS Liakos was an accounting department supervisor for 10 years for the Bakery & Confectionary Union's Welfare & Pension Funds.

He is a native of Washington, DC, and attended Benjamin Franklin University. He is a member of the National Society of Public Accountants.

In making the appointment APS Executive Secretary and Treasurer, Martin Frank, said, "The Society is fortunate, indeed, to have a person who can step in immediately and replace Walter Sonnenberg, who has given APS a stable financial base. Jim Liakos is such a person. His past experiences and his abilities assure the Society of a smooth transition and continued fiscal stability."

Sonnenberg has moved to the Sarasota area of Florida, where he plans to be active in hospital volunteer work.

John F. Perkins, Jr. Memorial Award

The American Physiological Society invites applications for the John F. Perkins, Jr. Memorial Fellowships. The fund is designed to provide supplementary support to the familes of foreign physiologists who have arranged for fellowships or sabbatical leave to carry out scientific work in the United States. Applications by US physiologists who require supplementary assistance to work abroad will also be considered.

It is the interest of the Perkins Fund to develop the full potentialities for cultural benefit associated with scientific exchange. Preference will be given to physiologists working in the fields of respiratory physiology, neurophysiology, and temperature regulation.

Each application should be made by both the visiting scientist and his host. Ordinarily, the joint applicants will have made financial arrangements for the visiting scientist before applying to the Perkins Fund for family support. The application should contain an account of these arrangements with a description of the proposed scientific work and a brief account of how the visitor and his family intend to make use of the cultural benefits.

The amount available for each award will be in the range of $3,000-7,500, depending on the estimated needs of the family over and above the amount already available to the visiting scientist. Ordinarily, two to four awards will be available in any one year.

Application forms for host and visiting scientist may be obtained from Dr. Martin Frank, Executive Secretary, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814.

Future Meetings

1986	
FASEB Annual Meeting	April 13–18, St. Louis
IUPS Congress	July 12–18, Vancouver, Canada
APS Fall Meeting	October 5–10, New Orleans
1987	
* FASEB Annual Meeting	March 29–April 3, Washington, DC
APS Fall Meeting	October 11–16, San Diego
1988	
FASEB Annual Meeting	May 1–6, Las Vegas
Joint APS/ASPET Fall Meeting	October 9–14, Montreal

* APS Centennial Celebration

APS Membership Statistics

Total Membership 6,649

Distribution by Employment (5,593 Respondents)

	No.	%
Medical schools	3,666	65
Physiology departments	1,912	34
Other preclinical departments	464	8
Clinical	1,241	22
Administration	49	1
Hospitals and clinics	243	4
Veterinary schools	112	2
Dental schools	49	1
Public health and graduate schools	189	3
Undergraduate schools	496	9
Commercial companies	123	2
Government	339	6
Institutes and foundations	208	4
Private practice	45	1
Other, emeritus or inactive	123	2

Distribution by Earned Degree (5,548 Respondents)
(Includes 683 individuals with multiple doctorate degrees)

	No.
Ph.D.	3,868
M.D.	2,200
D.V.M.	136
D.D.S. and other	27

Principle Type of Work (5,595 Respondents)

	%
Research	71
Teaching	15
Administration	7
Clinical	6
Other	1

Statistics represent membership as of February 1986.

Distribution by Age
(Optional personal data)

	Total respondents
70+	630
60–69	1,041
50–59	1,619
40–49	1,888
30–39	1,041
20–29	40

Distribution by Primary Specialty (5,489 Respondents)

	%
Cardiovascular	21
Neurophysiology	12
Respiration	11
Endocrine	9
Renal	6
Muscle and exercise	5
Electrolyte and water balance	5
Gastrointestinal, food, and nutrition	4
Cellular and tissue	3
Environmental	3
Comparative	3
Blood	2
Energy metabolism and temperature regulation	2
Pharmacology	2
Reproduction	2
All other categories (none > 1%)	8

Distribution by Racial Background and Heritage
(Optional personal data)

	Total respondents
American Indian or Alaskan	7
Asian or Pacific Islander	261
Black	33
White	4,325
Hispanic	84

US States With More Than 100 Members
(50 States plus Puerto Rico and Virgin Islands)

California	664
New York	613
Texas	366
Maryland	323
Pennsylvania	320
Massachusetts	319
Illinois	292
Ohio	226
Michigan	177
Florida	165
North Carolina	159
New Jersey	157
Virginia	136
Missouri	133
Connecticut	121
Minnesota	116
Wisconsin	107
Tennessee	105
Washington	101

Distribution by Sex
(Optional personal data)

	Total respondents
Female	707
Male	5,645

APS North American Membership

US	5,880
Canada	251
Mexico	7

Canadian Provinces with 5 or More Members

Ontario	101
Quebec	68
Alberta	30
British Columbia	24
Manitoba	21
Nova Scotia	10
Saskatechewan	8

Other provinces represented
New Brunswick
Newfoundland
Yukon Territory
Prince Edward Island

APS Membership Outside North America
Countries with 5 or more members

Japan	34
United Kingdom	31
Federal Republic of Germany	30
Switzerland	24
France	12
Sweden	11
Israel	11
Australia	11
Italy	9
Denmark	8
Netherlands	8
Belgium	7
Norway	7
Spain and Canary Islands	6
Venezuela	6

Other countries represented
Argentina
Austria
Brazil
British West Indies
Chile
Greece
Hong Kong
Hungary
Iceland
India
Kuwait
Lebanon
New Zealand
Nigeria
Panama
Paraguay
Peoples Republic of China
Peru
Poland
Portugal
South Korea
Rhodesia
Saudi Arabia
South Africa
Taiwan
USSR
Yugoslavia

(*Continued on p. 31*)

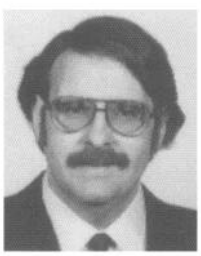
APS member **Norman B. Marshall**, Ph.D., has been appointed Vice President, Products Development, Pharmaceutical Research, from former Executive Director of Support Operations Research at Upjohn Co. Dr. Marshall has been very active in Society affairs as Chairperson of the Liaison with Industry Committee.

Antonio Scarpa, M.D., Ph.D., has moved to Case Western Reserve University School of Medicine as Professor and Chairman of Physiology. Dr. Scarpa, former Professor of Biochemistry and Biophysics and Director of the Biomedical Instrumentation Group at the University of Pennsylvania School of Medicine, has been a member since 1974.

Rosemary S. J. Schraer, Ph.D. former Associate Provost and Professor of Biochemistry at Pennsylvania State University, University Park, has been appointed Executive Vice-Chancellor of the University of California at Riverside. Dr. Schraer has been a member of the Society since 1964.

APS member **Arthur M. Brown**, M.D., Ph.D., Professor and Chairman, Department of Physiology and Biophysics, University of Texas Medical Branch, Galveston, has moved to Baylor College of Medicine, Houston, TX, as Professor and Chairman of Physiology.

Joseph F. Saunders, Ph.D., Manager of Membership Services of the American Physiological Society, has been appointed Executive Officer of the American Association of Immunologists in Bethesda, MD. Dr. Saunders has been an APS member since 1981.



Richard J. Traytsman, Ph.D., of Johns Hopkins Hospital has been appointed to the board of The Scientists Center for Welfare. Dr. Traytsman has been a member of the American Physiological Society since 1976 and chairs the Career Opportunities in Physiology Committee.

Gian C. Salmoiraghi has been named Chairman, Department of Physiology, Hahnemann University, Philadelphia, PA. APS member Salmoiraghi has been Professor of Neurology and Physiology and Assistant Vice President for Research since 1984.

APS member **Joseph E. Rall**, NIH Deputy Director for Intramural Research, received an honorary M.D. on Nov. 11 from the University of Naples, Italy. An expert in endocrinology, thyroid hormones and diseases, and biochemistry, Dr. Rall presented a talk entitled "International Cooperation in Science and the Inevitability of Species Extinction." Dr. Rall has been a member of APS since 1955.

New NIH Director of Division of Research Grants

NIH Director James B. Wyngaarden, M.D., announced the appointment of **Jerome G. Green**, M.D., as Director of the Division of Research Grants (DRG), a component of the National Institutes of Health. In his new position, Dr. Green serves as a principal advisor to the office of the director of NIH in the formulation of grant and award policies and procedures. He also directs the development of the scientific review mission of the DRG; provides advisory and consultative services on Public Health Service (PHS) grant and award programs to PHS components, advisory councils, and grantee institutions; and directs the management of the NIH extramural data system.

Dr. Green, a native of Brooklyn, NY, received his B.S. degree from Brooklyn College (1950), magna cum laude, and his M.D. degree from Albany Medical College (1954), after which he served his internship at the Albany Hospital Medical Center. From 1957 to 1959 he served his residency in internal medicine at the PHS Hospital in San Francisco, receiving clinical training in a university-affiliated residency program with the University of California and Stanford. He was then a special research fellow at the Cardiovascular Research Institute at the University of California. For 5 years he was at the Cleveland Clinic's Research Division as senior research fellow and clinical investigator. Since 1972 Dr. Green has been Director of the Division of Extramural Affairs, National Heart, Lung, and Blood Institute.

Dr. Green's research interests include cardiopulmonary physiology, atherosclerosis, nutrition, and the epidemiology of cardiopulmonary diseases. He is a diplomate of the National Board of Medical Examiners and is licensed to practice in the states of New York, California, Ohio, and Maryland. He is a member or fellow of numerous professional societies, including the American Heart Association and the American College of Cardiology, and has served on many committees, both NIH and non-NIH.

The DRG provides for the central receipt of all PHS applications for research and research training support and makes initial referral to PHS components; assigns NIH applications to the bureaus, institutes, and divisions that provide support and to the DRG initial review groups; provides scientific review for NIH research grants, National Research Service Awards, and Research Career Development applications; collects, stores, retrieves, analyzes, and evaluates management and program data needed to administer extramural programs; and reviews and analyzes the character and direction of research and training supported through NIH grants and the resources necessary for such support.

Philip R. Steinmetz, Homer W. Smith Awardee in Renal Physiology

Philip R. Steinmetz, M.D., Professor of Medicine, is the winner of a select award for distinguished and original contributions to the knowledge of kidney function. He received the Homer W. Smith Award in Renal Physiology at the annual meeting of the American Society of Nephrology, where he also gave an address entitled "Cellular Organization of Urinary Acidification." The award is cosponsored by the Society and the New York Heart Association. Since its creation in 1963 in memory of a noted scientist-philosopher who was Chairman of Physiology at New York University, it has been presented to only 15 American and 5 foreign physiologists and nephrologists. Steinmetz, 58, has devoted more than 20 years to research on kidney physiology, dealing specifically with the mechanisms in cells that enable kidney tubules and similar urinary epithelia to conserve sodium ions and excrete hydrogen ions, thus maintaining the body's crucial acid-alkaline balance. He is the developer of a model system of a urinary epithelium for the study of the membrane transport processes of urinary acidification. Born in The Netherlands and educated at the University of Leiden, Steinmetz was on the faculty at New York University (where he had done a 2-year fellowship with Dr. Smith) and at Harvard before coming here in 1981. He has been a member of APS since 1961.

BOOKS RECEIVED

Alzheimer's Dementia: Dilemmas in Clinical Research. V. L. Melnick and N. N. Dubler (Editors). Clifton, NJ: Humana, 1985, 344 pp., illus., index, $34.50.

The Brain Machine. M. Jeannerod. Cambridge, MA: Harvard Univ. Press, 1985, 171 pp., illus., index, $16.95.

Calcium and Cell Physiology. D. Marme (Editor). New York: Springer-Verlag, 1985, 390 pp., illus., index, $45.00.

Chemical Neurobiology: An Introduction to Neurobiochemistry. H. E. Bradford. New York: Freeman, 1985, 493 pp., illus., index, $36.95.

Contractile Proteins in Muscle and Non-Muscle Cell Systems. E. E. Alia, N. Arena, and M. A. Russo (Editors). New York: Praeger, 1985, 732 pp., illus.

Growth Factors in Biology and Medicine. D. Evered, J. Nugent, and J. Whelan (Editors). London: Pitman, 1985, pp. 283, illus., index, $39.88.

Handbook of Physiology. A. P. Fishman (Editor). Bethesda, MD: Am. Physiol. Soc., 1986, 971 pp., sect. 3, vol. II, parts 1 and 2, illus., index, $275.00.

Lecture Notes on Clinical Medicine. D. Rubenstein and D. Wayne. Oxford: Blackwell, 1985, 373 pp., illus., index.

Neuromethods. Amines and Their Metabolites. Vol. 2. A. A. Boulton, G. B. Baker, and J. M. Baker (Editors). Clifton, NJ: Humana, 1985, 568 pp., illus., index, $64.50.

Neuromethods. Amino Acids. Vol. 3. A. A. Boulton, G. B. Baker, and J. D. Wood (Editors). Clifton, NJ: Humana, 1985, 304 pp., illus., index, $45.00.

Occupational Hazards and Reproduction. K. Hemminki, M. Sorsa, and H. Vainio (Editors). New York: Hemisphere, 1985, 333 pp., illus., index.

Physical Exercise, Nutrition and Stress. M. Asterita. New York: Praeger, 1985, 199 pp., index, $37.97.

Positron Emisson Tomography and Autoradiography: Principles and Applications for the Brain and Heart. M. E. Phelps, J. C. Mazziotta, and H. R. Schelbert (Editors). New York: Raven, 1985, 690 pp., illus., index, $89.50.

Programming Motor and Non-Motor Behaviour: Role of Striatum in Animals. M. Vrijmoed-de Vries. Meppel: Krips Repro, 1985, 262 pp., illus.

Senile Dementia of the Alzheimer Type. J. Traber and W. H. Gispen (Editors). New York: Springer-Verlag, 1985, 376 pp., illus., index, $49.00.

Topics in Gastroenterology. D. P. Jewell and P. R. Gibson (Editors). Oxford: Blackwell, 1985, vol. 12, 317 pp., illus., index.

Toxicity of Nitroaromatic Compounds. D. E. Rickert (Editor). New York: Hemisphere, 1985, 295 pp., illus., index.

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 doubled-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 1986 issue). Mail copy to APS, 9650 Rockville Pike, Bethesda, MD 20814.

Postdoctoral Fellowship. The State University of New York at Buffalo invites applications for a postdoctoral fellowship in the Department of Physiology. The position will entail basic research in the neural and humoral mechanisms that control smooth muscle tone in the pulmonary vasculature. Emphasis will be placed on the effects of peptides and arachidonic acid metabolites on pulmonary vein smooth muscle. Studies will be performed primarily on vessels that have been isolated from the lungs of dogs and sheep and mounted in tissue baths for the measurement of contractile force. Candidates should have a M.D. or Ph.D. degree in physiology or pharmacology; the salary is negotiable and the position is available July 1, 1986. Interested persons should contact Dr. James A. Russell, Dept. of Pediatrics, 166 Acheson Hall, State University of New York at Buffalo, Buffalo, NY 14214.

Chairman of Physiology. The University of Michigan is seeking an academic leader to direct the research, teaching, and service programs of its Department of Physiology. Qualifications include an M.D. degree or a Ph.D. degree in physiology or a related field, national stature as a researcher in an area of physiology, demonstrated commitment to teaching, and administrative ability. An instructional track faculty position would accompany the chairmanship appointment. Please respond to Edward J. McGuire, M.D., Chairman, Physiology Review and Search Committee, c/o Ms. Jeanne M. Kin, Medical Administration Staff Assistant, University of Michigan Medical School, M7330 Medical Sciences I Bldg., Ann Arbor, MI 48109-0010. [EOAEE]

APS NEWS
(*Continued from p. 29*)

News From Senior Physiologists

Letters to Roy Greep:

Jane Sands Robb Johnson writes "Thank you and the APS for the birthday greeting. It is nice to be remembered 30 years after retirement when one is 92." She sends news of her family and stepfamily. She has a nephew in China and a stepgrandson and wife in the Peace Corps in southern Africa. Her son has been supervising a project in Saudi Arabia for Bechtel Power & Engineering Co.

Eszter Kokas thanks the Committee for kind birthday wishes (her 82nd). She attended the 50th jubilee meeting of the Hungarian Physiological Society in Budapest last July. For health reasons she has given up her office and laboratory at the Department of Physiology, University of North Carolina, and has been doing some reading at home in Chapel Hill.

Charles A. Ely reports that since retiring 4 years ago from Columbia he has held interim teaching appointments at City College, Columbia, and New Jersey School of Medicine and Dentistry. "I can say that it has been a pleasure to be able to teach without other distractions and I have had more time to enjoy New York's many diversions."

Letters to Arthur Otis:

C. Herbert Ellis has found the 9 years since his retirement from Burroughs Wellcome full of opportunities to do some of the avocational things that had to be deferred before. He continues his "love affair with computers" begun on the job, although he now finds a word processor and a spread sheet to be about all he needs. He has shifted his research "from physiological to genealogical topics" and has been "trying to put biographical meat on the bones of my granddaughter's ancestors." In 1983 he moved to a Quaker life-care community, Kendal at Longwood, near Philadelphia. His wife of 46 years, Betty, died in 1984, requiring new adjustments, "but with plenty to do and people to love, 1985 has been on the whole a good year."

ANNOUNCEMENTS

IOM Releases Report on Biomedical and Behavioral Research Needs

The Institute of Medicine's (IOM) Committee on National Needs for Biomedical and Behavioral Research Personnel recently released its eighth report. It makes recommendations for desired numbers of National Research Service Awards (NRSA) in fiscal years 1988–1990. Its recommendations are based on findings that the postdoctoral pool of biomedical scientists is beginning to decline and that the need for new biomedical faculty will increase in coming years. The committee thus suggests that the number of full-time NRSA postdoctoral traineeships and fellowships in clinical sciences be increased from the current level of 2,400 to 3,000 by 1990 and that 85% of those awards be allocated to M.D.'s. It recommends that the number of NRSA predoctoral awards in basic biomedical sciences increase from about 3,400 positions in 1984 to 3,750 positions in 1988 and rise to 4,150 slots in 1990. The postdoctoral training awards in basic sciences should be increased from a level of 3,200 in 1984 to 3,800 by 1990 and that a total of 1,090 behavioral science traineeships, including both pre- and postdoctoral, be reached by 1987 and maintained through 1990. Overall, 13,035 NIH/ADAMHA/HRSA trainees are recommended for fiscal year 1988, with this number increasing to 14,195 by 1990. The IOM Report is numbered IOM-85-06 and is available from the National Academy of Sciences, 2101 Constitution Ave. NW, JH-640, Washington, DC 20410. Phone: (202)334-3186.

OTA Releases Report on Alternatives to Animal Use

The Office of Technology Assessment (OTA) recently released its report entitled *Alternatives to Animal Use in Research, Testing, and Education*. According to the report, for most areas of scientific research, fully replacing animal use with nonanimal methods, especially in the short term, is not likely. More likely alternatives, says OTA, are reducing the number of animals used and making procedures more humane.

Alternative technologies to animal use are reviewed in three areas: biomedical and behavioral research, toxicity testing, and education in the life sciences. Alternatives vary according to the different uses of animals in each area.

Research, and to a lesser degree, testing, will continue to require live animals for observing complex interactions of cells, tissues, and organs, says OTA. In testing, some whole-animal methods are being replaced by nonanimal methods, as new tests are validated. Federal regulatory agencies have recently indicated a willingness to accept data from alternative test methods. Chick embryo membranes, for example, are a promising alternative to rabbits' eyes for determining irritancy of chemical substances. Other test methods use cells, tissues, and organs in culture and chemical and physical models. In education, far fewer animals are used than in research or testing, and animal use in the classroom plays an important role in shaping positive attitudes about living animals.

Computer simulations of living systems can replace or complement some animal use, especially in education. However, use of animals is a prerequisite to the development of ever more sophisticated simulations, OTA points out. Computerized dissemination of testing and research results also could reduce some animal use.

Although reduction in numbers of animals used is a principal alternative, data currently available on animal use are very poor, according to OTA. Any estimate of animal use is a rough approximation. The best available data, says OTA, suggest a minimum of 17–22 million animals are used annually in the US. Included in these figures are 12–15 million rats and mice. Current data permit no statement about any trend in animal uses through recent years.

OTA identified seven policy issues Congress might address: encouraging the adoption of currently available alternatives; promoting research and development on more and better alternatives; disseminating information; restricting the use of animals; providing better estimates of the numbers used; establishing a minimum policy for animal use within Federal agencies; and changing implementation of or amending the Animal Welfare Act. OTA discusses several options for action on each of these issues.

Copies of the report *Alternatives to Animal Use in Research, Testing, and Education* are available at the US Government Printing Office, Superintendent of Documents, Washington, DC 20402. The GPO stock number is 052-003-01012-7; the price is $16.

Peter Debye Prize 1987 in Cardiovascular Diseases

The University of Limburg at Maastricht, The Netherlands, has been given the opportunity of awarding the Peter Debye Prize. This prize, in the amount of 20,000 guilders, is an award of appreciation. The funds for the Peter Debye Prize are provided by the Edmond Hustinx Foundation. This institution was founded by the Maastricht's industrialist Mr. E. Hustinx, who was greatly interested in promoting science and culture.

The prize will be presented for the fifth time in January 1987 to a person or group of persons (three persons as a maximum) who may be considered to have made a fundamental contribution to research in the field of cardiovascular diseases. The research that is especially thought of concerns molecular-chemical aspects of cardiovascular diseases and may include arteriosclerotic processes, blood coagulation, ischemia, and reperfusion but also chemical kinetics of substrates, ions, and macromolecules in the heart.

Nominations (in English) should enclose a curriculum vitae, a survey of the scientific achievements of the candidate(s) (not exceeding 4 pages), and a list of publications. To allow the jury to make a selection, the materials should be received before September 1, 1986. Further information about the prize can be obtained from University of Limburg, Dr. E. H. S. Drenthe, Secretary of the Jury, Office of the Rector, PO Box 616, 6200 MD Maastricht, The Netherlands.