servers want to turn their eyes from the problem. Research conducted and supported by NIDA legitimizes our hope and optimism that the problem eventually can be solved. Research is providing a better foundation on which the institutions cited above can base targeted interventions and general education efforts.

In fiscal year 1989, NIDA's investment of $240 million in research—less than 0.5% of what drug abuse costs the nation—will be a small salvo in a large war. Yet the knowledge we will gain is a potent weapon, one that will enhance the nation's concurrent investments in services and preventive outreach.

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Ecological Physiology

F. Harvey Pough's review (3 June, p. 1349) of the recent book *New Directions in Ecological Physiology* (*1*) clearly and accurately describes the views of the contributors to the book with respect to the importance of evolutionary considerations in future research activities in that field. Pough also notes that there is a "perception of stagnation" in the minds of many concerned active players. Over the past several years this perception has been the subject of much discussion. My impression is that an atmosphere of negativity has developed that is adversely affecting both the professional activities of many of the discussants and career decisions of graduate students.

Considerations not mentioned either in the book or in the review make me believe that gloomy forecasts for ecological physiology are unjustified. New developments of many kinds are injecting vigor and significance into the effort to understand the biochemical, physiological, and behavioral bases for the functioning of animals in their environments, whether these environments are natural or modified by human activities. The suggestions of both the book's authors and of Pough are on target, but the territory is larger. There are also a number of other, equally interesting, options.

An important part of the problem of negativism seems to be overly narrow definitions of the scope of ecological physiology. The core is certainly basic research, but applied research is also essential. Animal physiology as a discipline originated in human medicine and remains dominated by biomedical concerns. Ecological animal physiology ignores the problems of biomedicine, veterinary medicine, and environmental management and protection at its political and fiscal peril. There are a series of new and growing industries that are largely based on applied ecological physiology (for example, environmental toxicology; bioassays for pollution detection and monitoring; and environmental and endocrinological modifications of animal breeding).

Beyond this, the field is being revolutionized by new techniques that permit both study of important questions not previously accessible to controlled measurement or experimentation and study of much investigated questions at new levels of structural complexity. Four selected examples follow.

1) Direct studies of unrestrained animals in nature have begun to permit separation of ecological physiological realities from laboratory artifacts. New detectors, miniaturization, and computerization of electronics and telemetry techniques are combining to give us real world pictures of thermoregulation, activity, bioenergetics, circulatory adaptations, and so forth. One important set of such studies has been carried out on diving animals (*2*).

2) Applications of modern methods in neurobiology to classical questions relating to orientation and object location in vertebrates are producing sophisticated and elegant pictures of central nervous system organization and function, including striking demonstrations of close correlations between such different sensory modalities as sight and hearing (*3*).

3) Genetic engineering and other molecular biological techniques are permitting the elucidation of underlying mechanisms and controls for a wide array of physiological processes. One of the more promising approaches to the classic questions of genetic versus environmental influences derives from the ability to produce clones of readily available teleost fishes. This technique is also being applied on a large scale in the selective breeding of desired strains of several species of commercially important salmonid fishes (*4*).

4) An array of modern biochemical and biophysical techniques is permitting the clarification and understanding of the processes and controls involved at levels ranging from the submolecular to the organismic, thus making possible for the first time essentially complete descriptions of the mechanisms underlying ecologically significant physiological phenomena occurring at the organismic level. A striking set of examples may be found in studies of freezing resistance and freezing tolerance in Antarctic and Arctic fishes (*5*).

This list can be made much longer. In my view, ecological physiology is not in any way stagnating. It is, rather, at the threshold of a renaissance that will take it in many new directions.

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Sex Survey

Readers may be interested in further information about the two surveys conducted by Paul Cameron, cited by him in his letter of 13 May (p. 867), in which he stated that he has "better estimates of the true numbers of homosexuals" than those obtained elsewhere.

His first-cited study (*1*) refers to an earlier study of 4340 respondents (*2*). This paper did not say that "about 2% of U.S. males claimed to be homosexual and about another 2% claimed to be bisexual in 1983 . . . ." In that study, 5.8% of the male respondents reported themselves as "bi- or homosexual" (*2*, p. 293).

Making a mountain out of a molehill? Not at all. This 4% figure was applied to the denominator of a fraction expressing the incidence of AIDS among homosexuals (*1*). If the 5.8% figure is changed to 4%, the estimate of this incidence is increased from 0.0019 to 0.0027, a difference of more than 40%.

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Erratum: Figure 2A on page 1483 in the report "*Nef* protein of HIV-1 is a transcriptional repressor of HIV-1LTR" by N. Ahmad and S. Venkatesan (16 Sept., p. 1481) was incorrectly labeled. The *x* axis should have been "Time after transfection (hours)."