zero" or the index case in a CDC epidemiology study. We are told that researchers "would retrace the airline steward's travel during that [1980] summer, fingering through his fabric-covered address book to try and fathom the bizarre coincidences and the unique role the handsome young steward performed in the coming epidemic." In the ensuing 400-odd pages Shilts argues (as has been widely reported in television and newspaper accounts of this book) that Dugas seemed to "introduce" the disease to the New World and that, as the establishment knew so much about Dugas, it is inconceivable that they could not have stopped the spread of the disease. Anyone knowledgeable knows that to pin a global epidemic on the actions of single individual is absurd. No epidemiologist would claim that without Dugas there would have been no AIDS epidemic. Even Shilts knows this, for on p. 439 he writes: "Whether Gaetan Dugas actually was the person who brought AIDS to North America remains a question of debate and is ultimately unanswerable." So patient zero is only a convenient device to engage the reader.

I doubt that many will read to p. 439 or catch the caveat. Perhaps some will argue that literary license excuses such misinformation. Other examples include calling interleukin-2 "a culture" rather than a regulatory factor made by cells in culture (p. 270), or depicting the AIDS virus as a member of "a small subgroup of viruses, retroviruses," that in 1981 were "at best an obscure microbe" (p. 73). Retrovirology had been a thriving field for a decade prior to the appearance of AIDS, and many attribute to the richness and maturity of that field the ability to learn so much so quickly about AIDS. Contrary to the image of "obscurity," the contribution of pre-1981 retrovirology to understanding AIDS is a powerful argument for the support of non-targeted, basic biomedical research.

Shilts's inaccuracies may make good copy, but concerning an epidemic where rampant misinformation has caused serious problems inattention to detail is unforgivable. The tactics Shilts uses for making a point often have the same fault he attempts to expose. A reading by a technical consultant could well have eliminated these problems. Yet the errors are frustrating and raise the question whether similar misstatements characterize the political analysis.

As a political statement *And the Band Played On* again mirrors its subject. For example, Shilts traces the role of New York writer Larry Kramer from his correct assessment that the "establishment" would be slow to respond, the founding of the Gay Men's Health Crisis, and the writing of *The Normal Heart*—a play that galvanized New York City theatergoers into awareness of the city's abysmal response to AIDS. Like Kramer's play, *And the Band Played On* is a personal and selective view of the first years of the AIDS epidemic. It is a moving portrait of a community laid waste by a deadly disease and an indictment of society's failure to recognize and address a health emergency. It is also an impressionistic tableau that calls in question the organization and responsibility of the biomedical community.

In sum, this angry book raises legitimate and serious questions but leaves the answers to the reader. *And the Band Played On* is a flawed but important addition to the literature of AIDS.

SANDRA PANEM
Alfred P. Sloan Foundation, New York, NY 10111-0242

Smooth Muscle Function

Regulation and Contraction of Smooth Muscle. MARION J. SIEGMAN, ANDREW P. SOMLYO, and NEWMAN L. STEPHENS, Eds. Liss, New York, 1987. xxii, 507 pp., illus. $96. Progress in Clinical and Biological Research, vol. 245. From a conference, Minaki, Ontario, July 1986.

In recent years there has been considerable interest in the contraction and regulation of smooth muscle. For years researchers on smooth muscle function have relied heavily on the large amount of knowledge obtained from the study of skeletal muscle proteins and fibers. Smooth muscle differs from the striated muscles that clothe the skeleton in two primary respects. Whereas striated muscle fibers have a highly ordered arrangement of thin and thick filaments that makes the muscle amenable to study by electron microscopy, x-ray diffraction, and sophisticated mechanical techniques, smooth muscle has a far less ordered arrangement of filaments, which drastically complicates its study and has been the greatest impediment to a detailed understanding of the contractile events. The second major difference between the two types of muscle lies in their regulation by calcium. Striated muscle is regulated by a complex of proteins, troponin and tropomyosin, located on the actin-containing filaments. In smooth muscle calcium regulation is thought to be primarily due to phosphorylation of a particular subunit of the myosin molecule by means of a calcium- and calmodulin-dependent kinase.

The study of smooth muscle contractility now integrates researchers from physiology, biochemistry, pharmacology, and anatomy. This volume reflects the diversity of disciplines and provides a useful reference for understanding the current state of knowledge in this progressing field.

The papers are divided into six sections, each consisting of five to ten contributions. In addition, 19 poster presentations are included at the end of the volume. The only major area of smooth muscle research that is not well represented is the study of ion channels and electrophysiology. This, in part, reflects the fact that enough information on the contractile proteins and the contraction of fibers has been obtained in recent years to warrant a full symposium on just these aspects of smooth muscle function.

The first section details the ultrastructure of smooth muscle, specifically the arrangement of contractile units within the muscle. There are excellent electron micrographs of isolated native thick filaments and of the interdigitating thin and thick filaments present in skinned smooth muscle cells. Furthermore, several papers provide convincing evidence that smooth muscle, like the better-studied striated muscle, contracts by means of a relative sliding of thin and thick filaments due to cycling crossbridges composed of the "heads" of myosin molecules. Data that support this model come from both transient kinetic analysis of purified actin and myosin and caged ATP experiments with skinned smooth muscle.

The next two sections deal with the biochemistry of the purified contractile proteins. The contributions here include studies of the effect of phosphorylation on the conformation of myosin, the mode of action of caldesmon, and the biochemistry of the kinases and phosphatases that are involved in the phosphorylation and dephosphorylation of myosin.

There is a section on the pharmacology of smooth muscle that, in general, concentrates on trying to explain the effects of various drugs on the function of smooth muscle by integrating what is known about the contractile mechanism and biochemistry of the purified proteins.

The final two sections deal with the physiology and energetics of either intact or chemically skinned smooth muscle fibers. This is perhaps the most interesting area of smooth muscle research, for it is quite clear that our knowledge about the function of the purified smooth muscle contractile proteins is not sufficient to explain the complexity of a smooth muscle fiber contraction. This complexity is primarily manifest in the so-called "latch phenomenon" that occurs during stress maintenance in a sustained smooth muscle contraction. During the latch state, tension is maintained by presumably slowly cycling and sometimes dephosphorylated

crossbridges. Many of these papers deal with this issue, and a computer model is proposed that attempts to explain latch in terms of the properties of cycling crossbridges. This model proposes that crossbridges that are dephosphorylated while attached to myosin cycle more slowly than phosphorylated crossbridges, presumably because of a slower detachment-rate constant from actin.

The book has a few irritating features. There is a mixture of typefaces among the individual chapters, and in some cases it is difficult to determine where figure legends end and text begins. In addition, a few of the halftone figures are poorly reproduced.

Aside from these minor problems, the book is a valuable resource for investigators in this field and for researchers or students who wish to learn the current state of affairs in smooth muscle research. Perhaps its most valuable contribution lies in showing that there is still much to be learned about the regulation and mechanism of contraction of smooth muscle.

JAMES R. SELLERS
National Heart, Lung and Blood Institute, Bethesda, MD 20892

Comparative Endocrinology

Hormones and Reproduction in Fishes, Amphibians, and Reptiles. DAVID O. NORRIS and RICHARD E. JONES, Eds. Plenum, New York, 1987. xxvi, 613 pp., illus. $95.

As the editors of this volume indicate in their preface, there are five primary reasons for examining the reproductive endocrinology of species that most endocrinologists would regard as "exotics." These include the obvious advantages of understanding the endogenous mechanisms controlling reproduction in economically important or endangered species and the potential use of endocrine manipulation to enhance production or manage natural populations. Though these are primary incentives for much of the work currently under way in comparative reproductive endocrinology, it is basic rather than applied reproductive endocrinology that is the primary focus of this volume. The editors point out that the examination of homologous and analogous hormonal systems in diverse species can provide a clearer understanding of the evolution of reproductive control mechanisms, and the book is organized in such a way as to facilitate such analysis; the 19 chapters, all reviews written by leading researchers in the field, concentrate on major research topics rather than on any one phylogenetic group.

These topics, chosen to represent the primary areas of investigation, range from hormonal control of sexual differentiation to aging of neuroendocrine systems and include hypothalamic, pituitary, ovarian, and testicular function. Summaries are provided for rapidly emerging areas of research (structure and function of gonadotropin-releasing hormones, characterization of steroid receptors), as well as for topics of long-standing interest (hormonal control of oocyte growth, maturation, and ovulation, vitellogenesis, pineal function, sexual differentiation, reproductive behavior, seasonality, and viviparity). Some topics (male accessory ducts, stress, thyroid function, and aging) are comprehensively reviewed here for the first time in a comparative reproductive context.

Within each chapter, separate consideration is given to fishes (usually taken to include Agnatha, Chondrichthyes, and Osteichthyes), reptiles, and amphibians, with summaries of mammalian and avian findings often included as background. Consequently, the species index includes over 400 entries representing all the vertebrate classes. The danger that chapters become little more than lists of research findings by class is occasionally apparent. A major strength of the book, however, is that it reviews a broad and vigorous field of research comprehensively and coherently. Most of the chapters conclude with summaries meant to provide an evolutionary context for the assembled facts and identify the important areas of research progress.

A final rationale the editors give for comparative reproductive research is that ectotherms may in some circumstances serve as model systems for the identification and investigation of fundamental physiological processes with applications to mammals and birds. Unfortunately, an ectothermic model system that has been embraced by the endothermic research establishment is about as rare as a mammalian endocrinologist who closely follows the comparative literature. A successful example, the African clawed frog *Xenopus laevis*, which is now used extensively to study the molecular mechanisms of oocyte development, is discussed frequently throughout the book, although no more frequently than other dominant ectothermic model systems, such as salmonid and cyprinid fishes, ranid frogs, and the lizard *Anolis*. This book serves well to identify the areas of research where studies of poikilotherms are making significant contributions to our basic understanding of the endocrinology of reproduction, including neuropeptide structure-function relationships, environmental and hormonal interactions in the control of reproductive seasonality, and cellular and molecular mechanisms of hormone action. It also identifies many gaps in our knowledge of ectotherm reproduction. Its thorough treatment of the most active area of comparative vertebrate endocrinology makes it essential to the library of any comparative endocrinologist, but it should also be valuable to any endocrinologist or reproductive biologist interested in obtaining a new perspective on a particular research problem or a broader context for interpretation of results.

DUNCAN S. MACKENZIE
Department of Biology, Texas A&M University, College Station, TX 77843

Secularization and Technology

The Restoration of Perfection. Labor and Technology in Medieval Culture. GEORGE OVITT, JR. Rutgers University Press, New Brunswick, NJ, 1987. xiv, 272 pp. $32.

This book is not a history of labor or of technology during the Middle Ages. It is, rather, a study of the cultural context of these during the medieval period, with culture being construed in terms of dominant intellectual (that is, theological) ideas and attitudes. George Ovitt's analysis, aimed at the formulation of a perspective on the Middle Ages that permits an accurate assessment of their place in the history of Western labor and technology, confronts repeatedly some celebrated (although variously conflicting) understandings of the medieval achievement.

One of these relates to the modern idea of progress, which Ovitt traces from its 17th-century origins, beginning with Francis Bacon, to the present. Progress, within this perspective, was triggered by the repudiation of the intellectually stultifying culture of the Middle Ages (stultified by religion) and has been sustained ever since by the commitments of reason, science, and technology to the study and exploitation of nature for the benefit of man. Ovitt's reservations concerning the virtuousness of that enterprise resound throughout the book. With respect to the representation of medieval religion as necessarily inimical to progress, technological or otherwise, Ovitt suggests that the notion of progress is relative and that medieval theology did itself embrace an idea of progress. This did, to be sure, enjoin and subordinate human ingenuity and society to the workings of Providence, but that need not and did not prove a complete barrier to the development of efficient labor or of technology or to the major