level, the nature of the material is such that the book should be used by advanced undergraduate or beginning graduate students. These students should have knowledge in the areas of basic microbiology and biochemistry or cell physiology.

Equal treatment is given to all topics, but the chapters on subcellular structure and microbial genetics are particularly outstanding. The diagrams, charts, and tables, although not presented in elaborate fashion, are informative, pertinent, and easy to follow, i.e., Moat has taken a "no-nonsense" approach to presenting this type of material, and is to be commended. Current information is presented and an extensive literature review is to be found at the end of each chapter for those who wish to read in greater depth and gain additional information. These literature reviews would be of particular value to the graduate students and to a professor teaching a course such as this. The table of contents is descriptive and the index listings are comprehensive and easy to cross reference. These two features facilitate finding various subjects in the book. Possibly the addition of chapter objectives in any future editions would assist the reader in gaining insight into the overall intent of each chapter, but their absence does not take away from the many other positive features of this edition.

Overall, this book is well written, easy to read, and an excellent introduction to the discipline of microbial physiology. Best of all, the author wrote the book with the student foremost in mind.

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Physiology and Anatomy

ANIMAL ANATOMY AND PHYSIOLOGY
by Jesse F. Bone. 1979. Reston Publishing Company (Reston, Virginia 22090). 550 p. $16.95.

Sooner or later every biology teacher is asked how some bit of human anatomy compares with that of pets or other domestic animals. The scanty comparative material included in most high school and college biology texts seldom satisfies these questions.

Bone's book will find frequent use in biology classrooms because it contains the details of comparative anatomy and physiology all of us are curious about from time to time. For example, there is a bone-by-bone description of the skeletal systems of the horse, cow, sheep, pig, dog and cat. Even more fascinating is a comparison of the reproductive patterns (behavioral and anatomical) of these and many other animals. There is a chapter on the anatomy and physiology of the fowl.

This is a college text written to meet the needs of the student of animal science, agriculture, or wildlife. It is not a text for veterinary students, though the author is professor of veterinary medicine at Oregon State University. Bone has carefully pared down the professional vocabulary to an accurate, but not overly technical level. He does not presume a knowledge of advanced chemistry on the part of his readers. He has not included any mathematical models.

Bone's writing is direct, clear, and at times even personal. The author seems to be having a good time describing to his reader the elements of anatomy and physiology as they apply to animals we all know and love. He is interested in word origins and enjoys making practical application of scientific facts. In the section on teeth, Bone takes up the process of determining the age of a horse by its teeth. In the chapter on the skeleton, he describes the differences in behavior that a fused radius and ulna causes. Reading about the respiratory system, we learn that veterinarians have an equivalent to the obstetrician's slap on the baby's buttocks called the anal reflex. Some surgical techniques are described where the technique may help in understanding a physiological process: The pneumothorax helps explain the physical aspect of breathing. Throughout the text there are tables succinctly comparing one or another aspect of domestic animal anatomy or physiology such as blood clotting time, male reproductive accessory glands, and composition of milk.

The diagrams are generally clear. In a few places label lines are confusing. All diagrams are in black and white and there are no photographs. The horse is the animal most used for illustration, but several systems are drawn against outlines of dogs and cows. Readers may wish there were more diagrams, especially in the chapters on the vascular and muscular systems.

A few years ago when a high school class in human anatomy first met the male articulated skeleton, one boy (the son of a veterinarian) asked where "it" was. The teacher and class knew immediately that the boy wanted to see the bone of the penis. The teacher laughed and said that the penis doesn't have a bone in it. The boy insisted that there was such a bone in other animals. The teacher had not heard of it and could find no references to back up the boy's claim. He assumed the boy was wrong. Had Bone's book been at hand, the discrepancy could have been easily settled. The *os penis* exists in dogs, mink, seals, walruses, raccoons, and some rodents. (My apologies, Jeff.)

Let that incident illustrate the usefulness of Bone's *Animal Anatomy and Physiology* in high school. The book's chief usefulness will be as a textbook in certain college zoology classes.

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LABORATORY TEXTBOOK IN ANATOMY AND PHYSIOLOGY
by Philip J. Costa and Richard G. Cotty. 4th ed., 1980. Kendall Hunt Publishing Company (2460 Kerper Boulevard, Dubuque, Iowa 52001). 316 p. $8.95.

This lab manual is for the combined, college anatomy and physiology course of two semesters. The text is directed at the college level introductory anatomy and physiology student who has a basic college preparatory background. This is *not* an allied health textbook but rather a biology lab book that uses some medical references for relevancy and concept reinforcement.

Basic content is divided into chapters that relate to ten specific body systems' anatomy followed by a chapter that exposes the student to that system's physiology through related experiments. Although I do not agree with the sequence of chapters, they are written to be flexibly sequenced into the needs of most any introductory anatomy and physiology lab. Each lab is organized to direct the student through the lab exercise with minimal instructor involvement.

Occasionally, a chapter ends with a "Student Work" section that requires responses to varied questions and statements that include student sketches and reviews of that chapter's information. Chapters that relate to physiology have a "Question" section that provides space for student answers to reinforce basic chapter ideas. All pages are perforated to allow for the collection of a student's work. The format type is crisp and easy to read with key words or statements in capitals. The terminology is direct and serves as a learning experience. Photographs are black-and-white with clear and accurate labeling. Sketches of the articulated skeleton and human muscles are definitely inferior when compared to other lab manuals. Appendix 1 lists common conversions with appendix 2 providing labeled fetal pig musculature photographs as an alternative to cat dissection labs.

This edition is an improvement over the previous edition, especially in revised