Mathematics Textbook

A First Course in Calculus. Serge Lang. Addison-Wesley, Reading, Mass., xii + 258 pp. Illus. $6.75.

In the foreword Lang states that this book "is written for the student, to give him an immediate, and pleasant, access to the subject. I hope that I have struck a proper compromise between dwelling too much on details, and not giving enough technical exercises. . . ." It is readily discernible that the goal of avoiding too many details has been attained.

The author reflects a thorough knowledge of the subject about which he is writing and of related mathematical specialties. Many notions which are basic to the study of calculus are explained in an excellent manner—among these are the treatment of inequalities (in section 1.2) and that of the slope of a curve (in section 3.1). The concept of a derivative and the theorems on derivatives are clearly presented. Chapter 9, "Integration," and chapter 10, "Properties of the integral," are worthy of special commendation.

Informal language is frequently used; some examples are—"We can then make up a right triangle" (p. 26) and "to prove that e^x/x^m becomes very large when x does, it suffices to do it for its log" (p. 131). Some concepts are defined in a fairly precise manner (derivative, p. 40; indefinite integral, p. 134; definite integral, p. 145), but others are rather loosely characterized [the equation $y - b = 1/(x - a)$ is known as a hyperbola (p. 33); an ellipse is a stretched-out circle (p. 31)].

Lang defines a function as a rule (section 1.3), and generally elects not to distinguish between a function f, its defining equation $y = f(x)$, the expression $f(x)$, and the graph of f. A closed interval is denoted by $[a, b]$, but the conventional symbols for other types of intervals are not used. The form in which the mean value theorem for derivatives is given is different from the standard form of this theorem, in that differentiation over a closed interval is required. Consequently the mean value theorem as stated is not applicable to such situations as $f(x) = \sqrt{x}$ over the interval [0,9].

Antiderivatives, inflection points, and differentials are not mentioned, and relatively little attention is given to differentiation of composite functions. Chapters 9 and 10 (on integration) give practically no attention to integration of composite functions, but brief consideration is given to this in chapter 11. Integration by use of trigonometric substitution appears in one brief illustration (p. 172), apparently without mention by name and without further discussion. In this respect one wonders if the student who uses this book may not be handicapped in subsequent study of intermediate calculus and differential equations.

The book has a pleasing, uncomplicated appearance and I noted only a few misprints. To those who are looking for a short calculus book, of limited coverage, written in an informal manner, I recommend Lang's book.

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Constituents of Life

Comparative Biochemistry. vol. 5, pt. C, *Constituents of Life*. Marcel Florkin and Howard S. Mason, Eds. Academic Press, New York, 1963. xx + 637 pp. Illus. $20.

The varied styles and approaches make the multiauthorship of this book very apparent. Chapter 1 (by Tschierish and Mothes) is a rather dull compilation of the known amino acids (122), their structural formulas and dates of isolation, as well as the elucidation of their structure and their syntheses. Their role in metabolism and comparative biochemistry is very sketchily reported. The article is marred by the poor quality of its translation; particularly jarring is the repeated statement that a particular amino acid contributes "x % to the synthesis of a protein." There is a record number of 842 references at the end of the chapter.

On the other hand, chapter 2 (by Takahashi, Taniguchi, and Egami) is a capable and up-to-date résumé of our present-day knowledge of the distribution and metabolism of inorganic nitrogen compounds. This chapter, which is concerned with the comparative aspects of the biochemical transformation of nitrogen, fits in extraordinarily well with the original aims of the editors.

The same can be said about chapter 3, "Acid metabolism: The citric acid cycle and other cycles" (by Lioret and Moyes). In this chapter, which is illustrated with many excellently executed diagrams, the authors discuss all the information concerned with the organic acids and their cycles and, at the same time, stress the comparative aspects of their subject. This chapter, and the preceding one, should be required reading for graduate students in biochemistry.

Chapter 4, "Comparative biochemistry of collagen" (by Gross), seems out of place in this volume, which is primarily devoted to the more dynamic aspects of comparative biochemistry. (It probably would have fitted better into volume 4.) Although this chapter provides the casual reader with a glimpse into the problems associated with the study of macromolecules, it may be too elementary for the specialist.

The next chapter (146 pages), a summary of the modern aspects of photosynthesis, was written by E. C. Wassink, an expert in the field. One is especially struck by the unsatisfactory and contradictory state of our knowldege about the actual photoreaction, quantum yields, and efficiency of the light energy conversion compared with the great progress that has been made in the elucidation of the path of carbon in photosynthesis. The chapter is a well-balanced effort to arouse the interest of the general reader and to provide the researcher in the field with thought-provoking ideas.

In the final chapter Roche, Fontaine, and Leloup discuss the comparative aspects of halides, which are almost universally distributed in all living organisms. Of the four halides—fluorine, bromine, chlorine, and iodine—iodine has received the most attention. Investigations have revealed many diverse problems, which emphasize the fact that the analogies, coincidences, and uncritical interpretations of the results have tended to oversimplify the problems of biochemical evolution in this field.

Volumes 3, 4, and 5 of this treatise provide a veritable smörgåsbord of information [for reviews of volumes 3 and 4 see *Science* **137**, 745 (1962) and **139**, 326 (1963)]. Some of the chapters will appeal only to the specialists, others will lead to a better understanding of the varied biochemical mechanisms used by the biological world to capture and conserve energy. The vast domain of *Comparative Biochemistry*, as the editors envisage it, encompasses all of