*Cicuta maculata*, underground parts should certainly have been shown, but for most species the drawings, though somewhat uneven in quality, seem to be adequate for general recognition.

The greatest deficiency is the absence of range date. For Ontario and the area around the lower Great Lakes, where nearly all the species may occur, there should be less difficulty, but for New England this becomes a serious shortcoming. Some 22 of the species treated here reach only to western New York; 21 others extend east only to Vermont or Massachusetts, while 11 more are found only to New Hampshire.

The book is of convenient pocket size and should prove adaptable for use in making field identification. It will also be useful for quick recognition where details of flowers and fruits are not important.

A. R. HODGDON
*Department of Botany, University of New Hampshire, Durham*

## On Teaching Biochemistry

How much biochemistry should we inflict on medical students? The question haunts everyone engaged in such teaching. The body of knowledge of this discipline has been increasing exponentially since the 1930's; the textbooks have been growing, and the medical students groaning, in proportion. It is no secret that most students resort to the use of "ponies" as guides through the maze of required information.

The authors of **Biochemistry** (Williams and Wilkins, Baltimore, 1965. 387 pp., $6.75), S. P. Datta and J. H. Ottaway, teach biochemistry at the universities of London and Edinburgh, and they have organized their lectures into a book which has gone through six editions under the title *Aids of Biochemistry*. *Biochemistry*, the current edition, is then apparently a pony grown to almost full size.

The organization of the book is traditional; it does not deviate from that found in books written 40 years ago: hydrogen ion concentration, chemistry of carbohydrates, chemistry and lipids, and so on. The student does not encounter anything dynamic until he reaches chapter 7 where enzymes are discussed. The authors cannot be blamed for this presentation; with respect to textbooks it is an almost universal heritage from the German school of biochemistry of some 60 years ago. For the first third or more of the course the student must endure a barrage of descriptive details of what is essentially the chemistry of natural products. He could be led much sooner into areas of biochemistry which may capture his imagination and which might make the memorizing of descriptive material more endurable. After all, one can teach all there is to know about enzymes if a student knows the structure of succinic and fumaric acids.

Another instance of the authors' overly strong ties with the past is their use of the meaningless term "detoxication" as a chapter title. However, to their credit, it should be noted that they promptly explain that no such process really exists. For, owing to advances in our knowledge of enzyme chemistry, it has bcoeme clear during the past three decades that what used to be called "detoxication" is simply the cumulative result of the lack of specificity of some enzymes. This teleologically rooted term should have been buried as soon as it became apparent that many "detoxication" products are more toxic than the starting material.

The book is very weak in the presentation of the impact of newer knowledge of genetics on biochemical thought. Nor is it free of serious errors. On page 81 the following statement is made: "Since the RNA which exists in the various subcellular fractions is probably heterogenous it is not surprising that there are wide variations in the estimates of its molecular weight; values between 20,000 and 2,000,000 have been found and liver sRNA probably has a molecular weight near 10,000." It would be difficult to devise a single sentence which would convey more misinformation about RNA.

The production of the book is dreadful. Small print is tightly packed on small pages. In the copy that I examined pages 281 to 316 are bound upside down and, consequently, in Hebraic order. How this blunder in the bindery escaped notice is beyond comprehension. I riffled the pages before the eyes of an intelligent 12-year-old child, and within a second she commenced the laughter of delight which she reserves for discoveries of "goofs" of the adult world.

It is difficult to see what purpose this book will serve. The need of medical students will not be fulfilled by more textbooks and more ponies. What is needed first is an agreement on the periphery of the area of the discipline to be covered. Such a delineation could come as a consensus from the teachers of biochemistry and the teachers of clinical subjects. Then a few well-written texts of reasonable size might present a coherent, current view of biochemistry which the medical student may receive with a sense of excitement.

ERNEST BOREK
*Department of Biochemistry, College of Physicians and Surgeons, Columbia University*

## Metals and Gases

The author of **Thermodynamics and Phase Relations** (Academic Press, New York, 1965. 322 pp., $13) is J. D. Fast, chief metallurgist at the Philips Research Laboratories and professor at the Technical University of Eindhoven. The two-volume series, *Interaction of Metals and Gases*, of which *Thermodynamics and Phase Relations* is volume 1, is apparently aimed at undergraduates and practicing metallurgists. This first volume is complete in itself, well written, and indexed. The author's style is very readable (as in his book on entropy) and his 50-page introduction to thermodynamics is unusually lucid; one topic leads smoothly into the next, symbols are adequately explained, equations derived, and many practical examples given. There are no home problems. Pertinent references to the literature (up to 1964) are given in footnotes on nearly every page.

The section on thermodynamics and the calculations of equilibria precedes chapters that deal with reactions of pure metals and gases (silver-oxygen to tungsten-oxygen systems), reactions of alloys with gases, carbon and oxygen in steel, solutions of gases in metals (emphasizing hydrogen), and solutions of gases in alloys. The gases (hydrogen, oxygen, nitrogen, and carbon monoxide) and the metals discussed are those of practical metallurgical interest with occasional mention of exotic alloys used as getters.

It would not be fair to criticize omission of many systems and subjects —for example, heat capacity, rare gases, and similar topics—that have been omitted or treated too briefly; however, the omission of defect-theory [see Libowitz's excellent book *Solid*