not in the chapter headings, four to the Gymnosperms, and five to the Angiosperms. The remaining chapters are devoted to an Introduction and discussions of the Gametophyte, the Sporophyte, the First Vascular Plants, and Heterospory and the Seed Habit.

As might be expected the first section of the book, that devoted to the Bryophytes, is in my judgment, the best, even though one seems to be turning the pages of Campbell's classic "Mosses and Ferns." The chapters on the vascular plants do not seem so fresh or based on first-hand information.

Campbell follows Engler in dividing the plant kingdom into two main divisions—Thallophyta and Embryophyta, which is quite as justifiable as dividing animals into Vertebrates and Invertebrates. He considers the Thallophyta as highly unscientific, which of course it is, but says there is abundant reason for Embryophyta, this being in the main the essential similarity in the reproduction of what he calls Bryophytes, Pteridophytes and Spermatophytes. Campbell believes that land plants were derived from some freshwater green alga, perhaps some form like Coleochaete among the Ulothricales.

He attaches great importance to the fact that the spermatozoids are biciliate in bryophytes and lycopods and polyciliate in the remaining pteridophytes, but doesn't go as far as Lotsy did in formally classifying the extinct Paleozoic groups on this basis. He regards Pteridosperms as an order rather than a class or phylum, and as representing the most advanced Filicinae or the most primitive gymnosperms.

The section of the book devoted to vascular plants may well be considered to mark the end of a morphological era which began with Hofmeister, of which it may be said that although it inspired a truly prodigious amount of investigation and publication, the garnered crop hardly fulfils the expectations of the cultivators. It seems to me that plant morphology has always been greatly handicapped by the fact that it was formulated almost wholly on the living flora at a time when ideas of phylogeny scarcely entered the minds of taxonomists, and when the concept of the flower was a mystical thing compounded of design in Nature and a pentateuchal cosmogony. These concepts were, in the main, those of morphological entities as fixed as the pieces of a jigsaw puzzle and almost wholly divorced from function (conduction, support, photosynthesis, etc.). These fixed morphological units, as rigid as the pre-Linnean concept of taxonomic species, were then carried back into the more primitive plant world of an enormous past. In other words, morphological units based upon the living flora might better be considered to have a phylogeny as well as an ontogeny and to be end products of an evolution just as truly as the so-called species of the systematist. This may have been envisaged in the author's frequent use of the word Homoplasy, but judging by the results this seems to be merely lip service to the idea.

Pilger's conclusion regarding the nature of the cone in the coniferales is a good illustration of my contention of the importance of function. Incidentally if, as contended, the ovular scale of the Pinaceae, epimatium of the Podocarpaceae are adaptations for the protection and nutrition of the ovules it follows that the Araucariaceae are more ancient than the Pinaceae. Campbell seems to consider a relationship between Araucariaceae and what he calls the Paleozoic Lycopodineae, but he is very cautious, and states the conflicting views without coming to a conclusion. What, other than tradition, can countenance our maintenance of Monocot and Dicot as the two classes of flowering plants, or calling the Caytoniales of the Jurassic Angiosperms, or considering the Devonian Psilophytales as Pteridophyta, or even the acceptance of the notion that the Filicales are of equal rank with Equisetales and Lycopodiales. With regard to the possible ancestors of the Angiosperms both the Gnetales and Bennettitales are discarded and Campbell, following Engler, favors a purely hypothetical group of protangiosperms.

As I hinted at earlier: When morphology shall have become wedded to function or adaptation, morphologists will be free of worry about telomes, caulomes, phyllomes, rhizomes and trichomes; we need no longer puzzle over whether the alternation of generations is antithetic or homologous, and, I believe, it will be a better world.

I can well imagine that the present work would be a wonderful text for advanced classes in comparative morphology since it is clear, inclusive, eminently scholarly and critical. That the book contributes anything beyond this to the evidence of the evolution and classification of plants is more doubtful.

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VETERINARY BACTERIOLOGY

Veterinary Bacteriology. By I. A. MERCHANT, D.V.M., Ph.D., C.P.H., associate professor of veterinary bacteriology and hygiene, Iowa State College. pp. 628. Ames, Iowa: The Iowa State College Press. Postpaid, $7.00.

THIS is a text-book written for students of veterinary medicine, but any who desire to have up-to-date descriptions of the principal organisms which affect the domestic animals will find the book useful and reliable. The writing is lucid, the arrangement is logical and systematic, and the subject-matter shows that the author has combed the literature recently and well. The publication date was in October, 1940, yet

the book contains many references to papers published in 1940. For a first edition there are remarkably few errors, typographical or otherwise. The author has called to his aid several collaborators; A. G. Karlson to write the chapter on the genus *Erysipelothrix,* C. T. Rosenbusch on the *Pasteurella,* S. H. McNutt on the *Brucella,* and L. H. Schwarte on "Filterable Viruses and Virus Diseases." With only a few exceptions, the illustrations were taken from that excellent collection of photomicrographs of bacteria contained in Nowak's "Documenta Microbiologica."

The arrangement of the chapters is not unusual. After two parts devoted to general biology of microorganisms and principles of immunity which together make up twelve chapters, the remaining 28 chapters are devoted to descriptions of the organisms and viruses which are pathogenic for animals. The pathogenic protozoa have been omitted on the assumption that protozoa, in the veterinary curriculum, will be considered in the course in parasitology rather than in bacteriology. This is not the case, in some institutions at least, and the reviewer feels the book is incomplete in this respect.

The author has done his best work in the portions of the book devoted to the description of organisms. These are clearly and systematically presented, and a short list of references is given for each section so the more ambitious student may read more widely if he desires. The portion relating to general biology is rather elementary, but the chapter on disinfection is better than is usually found in such text-books.

Students of veterinary medicine need a strong grounding in the bacteriology of milk and milk products, since many of them find themselves rather intricately involved in problems surrounding milk production and handling after graduation, and, for this reason, the reviewer misses a section devoted to this subject. In the crowded curriculum of veterinary schools to-day, there seldom is any opportunity for students to obtain much work in the bacteriology of milk, except in the course in pathogenic bacteriology. A chapter on this subject would, in the opinion of the reviewer, serve a much better purpose than the one on "Bacteriological Technics and Methods," which will be skipped by most teachers who are giving a laboratory course along with the lectures because it is inadequate as a laboratory guide and superfluous when one is used.

No two teachers have ever agreed on the exact content of any course or on how a course can best be given. Whereas the reviewer differs from the author in some respects on what he has selected and what he has left out of his book; nevertheless, it is his opinion that this text is well written, accurate and, of the group of shorter dissertations useful as student texts and brief reference, the best that we have in its field.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

A PROPOSED REVISION OF THE CONSTITUTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

FROM the time of its formation in 1848, the American Association for the Advancement of Science has been a democratic organization, directed and managed by a representative body under a published set of statements and rules.[1] The original "Objects and Rules of the Association" were amended and became its first constitution in 1851. A partial revision occurred in 1856 and some "constitutional troubles" were "finally disposed of" through the adoption of a new constitution in 1874, when the association was incorporated under the laws of the Commonwealth of Massachusetts. With occasional amendments to care for continual advance and improvement through experience, the constitution of 1874 remained in force for 46 years. Before 1887, the "standing committee" of the association controlled association affairs; through an amendment adopted in that year, the standing committee became the council, which has been the governing body since that time. By 1917 the constitution of 1874 had been rendered somewhat unsatisfactory because of the remarkable development of the association and its increasing activities. A special committee on constitution revision, consisting of J. McKeen Cattell (*chairman*), Herman L. Fairchild and Daniel T. MacDougal, began its studies in that year; on its recommendation the present constitution was adopted at the third St. Louis meeting two years later. With a few minor amendments, that constitution has been in force since January 3, 1920.

On December 30, 1939, feeling that a new revision of constitution and by-laws had again become desir-

[1] Much information on the history and development of the American Association may be found in the volumes of its Proceedings and Summarized Proceedings. Special reference should be made to Herman L. Fairchild's "History of the American Association for the Advancement of Science" (SCIENCE, 59: 365–369, 385–390, 410–415, 1924); to Austin H. Clark and Leila Forbes Clark's "Background and Origin of the American Association for the Advancement of Science" (Summarized Proc., 1929–1934: 15–30, 1934); and to F. R. Moulton's "Brief History of the Association" (Summarized Proc., 1934–40: 1–57, 1940).