others, it has no peculiar charms for the author who refuses to be stampeded by the apparently intelligent and purposive adaptations of organisms to conditions never experienced before or by the 'proportionate formation of parts' in regenerating embryos and adults. Such phenomena, he thinks, "may be entirely beyond the scope of legitimate explanation, just as are many physical and chemical phenomena themselves, even those of the simplest sort. * * * Even in the physical sciences it would not be difficult to establish a vitalistic principle, or whatever else it might be called, if we choose to take into account such properties as the affinities of atoms and molecules, etc. * * * For my part I see no grounds for accepting a vitalistic principle that is not a physico-causal one, but perhaps a different one from any known at present to chemistry and physics."

Finally, if the adaptations shown in regeneration cannot be explained by natural selection are they to be explained by some teleological principle? To this question the author attempts no direct answer. It is pointed out that not all forms of regeneration are adaptive, *i. e.,* useful, and that 'unless we suppose that some external agent, acting as we do ourselves, directs the formative processes in animals and plants, we are not justified in extending our experience as directive agents to the construction of the organic world.'

These brief extracts do not do justice to the author's argument, but they serve to show his general position on these important questions. The book will undoubtedly take a prominent place among the standard biological works of the world.

E. G. C.

Die Farngattung Niphobolus. By Professor GIESENHAGEN. Jena, Gustav Fischer. 1901. 8vo. Pp. xii + 223. Price, Mk. 5.50.

For a clean piece of monographic work the ideal conditions are a genus of plants of moderate size whose distribution is somewhat circumscribed, and with sufficient adaptability to environment to have induced striking structural characters among the species. Such a condition is represented in the present genus. To monograph such a genus one needs, in addition to library and herbarium facilities, to be possessed of a good knowledge of technique and above all to know the plants in the field. Such a knowledge of this genus Professor Giesenhagen gained in his travels in Sumatra and other portions of the East Indies and the result is a clearly written monograph of the fifty species of the genus.

The genus forms a rather natural group of ferns which has commonly been included under the genus *Polypodium,* and is easily recognized by the vestiture of star-like hairs covering the laminæ. The center of distribution appears to be in India and South China where nearly one half the species (21) are found. Westward the genus extends to Africa (two species), northward to Japan (three species), eastward to Taiti (one species), and southward to Australia (two species). Endemic species are known from most of the larger islands of this region, as Bourbon (one), Ceylon (three), Sumatra (one), Philippines (three), Java (two), Celebes (two) and Borneo (one). One or two species are well known in cultivation under the name *Polypodium Lingua.*

Sixty-five pages of the monograph are devoted to the morphology of the genus and the details of stem and leaf anatomy are clearly brought out, as are the modifications resulting from habitat and environment. This portion of the work is illustrated by a well-selected series of text figures illustrating structures comparatively, which is the only satisfactory method for a work of this sort. The descriptive portions are very clearly and fully made, an entire paragraph being given to anatomical details under each species—a valuable and noteworthy addition to ordinary taxonomic description. The English methods in taxonomy are frequently commented upon with no uncertain sound, being characterized as a classification with 'hands and eies only' (*sic*) by which they group together widely different species. The work of the English systematists who have hitherto recognized only twenty-three species in this group, is sharply contrasted with the careful work of Mettenius and Kunze in Germany. The author, how-

ever, forgets to note one feature of German taxonomic methods altogether too common in recent monographic work in his own country, and one that more than once has led him into minor errors that could easily have been avoided. In preparing his monograph, Giesenhagen had access to a loan for a short time of the herbarium materials from Berlin, which is unquestionably the finest Continental collection, and also had access to the types of Blume's Javan ferns from the Museum at Leyden, but the richest collection of all in this and every other genus of ferns, namely, that at Kew, England, the author never consulted. In fact, German monographers rarely consult this magnificent collection, and as a consequence of this neglect, go on producing monographs which contain either avoidable errors or lamentable omissions. To cite an instance from the present case, the English botanists had confused a common Indian fern with one of Blume's Javan species, of course without having seen Blume's plant, for English botanists do not always take the trouble to gather evidence if it involves crossing the English Channel to get it. Our present author, after an examination of Blume's type finds the Indian plant something very different, as might have been expected, and in spite of the fact that the Indian plant already had been named independently by other English botanists commencing with Wallich, proceeds at once to name it '*Niphobolus Mannii* n. sp.' This is surely an economical method of procedure—in fact saves the time and money necessary to visit Kew—but as a question of ethics or scientific accuracy it is not to be commended in a formal monograph. Wallich's name must hold for this plant unless there should prove to be an earlier one.

In short the principal criticisms that can be offered to the work in hand are those that bear on the lack of accuracy in citation and nomenclature and yet these imperfections mar an otherwise admirable volume. In citing specimens examined the author often uses an entire page and sometimes two pages in needlessly quoting the entire label from the herbarium sheet—data important in their proper place, but in even the more extended series here given capable of being condensed and better classified into ten lines in so far as they give information respecting geographic distribution. On the other hand *icones* are rarely cited and in some cases the reader is in doubt both as to the original author of the species described and its type locality. Last of all the name *Niphobolus* is itself untenable. The author, working under the old conception that a genus is a description or a definition instead of a group of related species, passes over Desvaux's genus *Cyclophorus* (1811) because neither in his generic description nor in those of its six species which the present author admits 'alle echte *Niphoboli* sint' does Desvaux mention the peculiar vestiture which characterizes the members as now understood. Because of this and because Kaulfuss in 1824 had substituted *Niphobolus* for *Cyclophorus,* since the latter name had been used for a genus of shells, our present author unfortunately uses the latter name, which in the rational and progressive system now in use in biological nomenclature cannot stand. It is unfortunate that so complete a monograph should be lacking in the minor essentials of modern scientific accuracy.

Lucien M. Underwood.

The Practical Methods of Organic Chemistry. By Ludwig Gattermann, Ph.D., Professor in the University of Freiburg. With numerous illustrations. Translated by William B. Schober, Ph.D., Instructor in Organic Chemistry in Lehigh University. Authorized translation. The second American from the fourth German edition. New York, The Macmillan Company. 1901. Pp. 359.

Gattermann's book is favorably known in organic laboratories. It consists of a brief general part dealing with analytical operations and laboratory methods, and a special part of organic preparations. To quote, 'To each preparation are added general observations which relate to the character and general significance of the reaction carried out in practice.' This feature is a very great help to the student.

This edition includes a number of new prep-