real sense of the word. In the first place are set forth in simple language and lucid style the fundamental facts of plant physiology and morphology. Although not elementary in its treatment, the book is one which the beginner may read with interest and profit. In the second place the general order in which the subjects are taken is the logical one from the teacher's standpoint.

In Part I. the author discusses the structures and functions of typical plant organs as found in the leaf, root, stem, flower, etc. Though the order of subjects in the first part is not the most advantageous, from the reviewer's standpoint, the relations of structure and function and the relation of the work of one organ to that of another is made clear, and one is acquainted with the business of a vegetable organism, and the nature of plant life, before taking up the study of the structure and relationships of the groups which form the substance of Part II.

In the second part we are introduced to the principal divisions of the vegetable kingdom in ascending order, typical examples being discussed with sufficient fullness and clearness to set forth the salient features of their kind. Due emphasis is laid upon phylogeny and discussions of points of biological interest are plentiful. One feature of the book which adds to its interest, and which will commend it to many readers, is the repeated reference to the practical application of botanical knowledge and the relation of certain plants to economic operations.

One is pleased to observe the excellent character of the illustrations. It is a relief to see illustrations that illustrate, after some of the wretched sketches and meaningless figures that characterize several of the recent text-books of botany.

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India Rubber and its Manufacture, with Chapters on Gutta-percha and Balata. By Hubert L. Terry. 8vo, pp. v + 291, illustrated. New York, Van Nostrand Company. 1907. $2.00.

One may fairly say that, next to mining, the growing of rubber has of recent years been increasingly regarded as a golden path to material ease. In common with mining, the project has its risks and drawbacks, and the only safe guide to intelligent investment in both is knowledge. This the general public does not have, but many individuals desire specific information, either for the reason observed, or for the sake of general enlightenment. With regard to rubber and its manufacture, Terry's book fairly meets this need; it is for such that it has been written. Though dealing with a distinctly technical field, the author has succeeded in making a very readable book, and this is due not a little to his pleasing style, occasional prolixity to the contrary notwithstanding.

One experiences a slight feeling of disappointment in reading the first two chapters, those dealing with the history of the matter and with the botanical origin of crude rubber. It would have been justifiable to have dealt with these topics with greater liberality, and the addition of treatment at greater length of the cultural aspects of the industry would have heightened the value of the book in a marked degree. It seems to the reviewer a fair criticism that the chapter on India-rubber Plantations is a trifle pessimistic. Mr. Terry's attitude is safe, because negative. A more just statement of the legitimate attempts which are being made in Mexico to cultivate rubber trees (*Castilloa*) would have had greater merit. Sharp practises do great damage to infant industries. So much more therefore do these demand proper representation at the hands of the critic.

To be commended in this connection is the effort to point out the need for adequate conservation of the natural forests of rubber-producing trees, a problem to which our modern forestry methods have not yet reached. Science will be needed in meeting this aspect of the industry quite as much as any other. Already her face has been turned toward plantation culture, with no little success, but the inevitable struggle of man with nature has already discovered a quite handsome array of

parasitic enemies, whose energies appear to be largely concentrated upon cultivated rubber-trees. The general criticism applied to the treatment of the botanical aspect of the case appears to be justified especially, for example, to the discussion of guayule, a rubber-producing plant with which Americans are more familiar (or perhaps one should say less ignorant). This plant is of peculiar interest because of its preference for the arid conditions of the central plateau of Mexico and adjacent Texas. Indeed, any plant which offers the possibility of using the desert with economic intent may well be thought worthy of special regard. With regard to the process of manufacture of crude guayule rubber the author appears not to be fully informed, but, as the industry is comparatively new, and as a number of methods have had more or less vogue, it is naturally difficult to get exact knowledge, especially at a distance, a difficulty not reduced by the natural effort at secrecy on the part of the manufacturers.

In the discussion of the technical aspects of the rubber industry the author is distinctly at home. Though often brief and summary, he gives the gist of the matter in a very satisfactory way, and this despite the very abstruse nature of the subject. Among the topics presented, to give a brief impression of the scope of the book, are the chemical and physical properties of rubber, its vulcanization, substitutes, reclamation, and the methods of manufacture of various classes of articles from it. It will suffice here to heartily commend the way in which the numerous pertinent details have been handled, since more than a very general criticism would occupy the time of the inquirer better spent in reading the original. As to the orthography, it may be captious to say anything, especially as we (speaking as Americans) have the sympathy of Mr. Terry himself, if we take exception to the English spelling of "tyre."

We may regret that the book is but poorly illustrated, more especially in the pen-drawings of rubber plants. These are hopelessly crude, and behind the times.

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SPECIAL ARTICLES

THE ACCLIMATIZATION OF AN ALFALFA VARIETY IN MINNESOTA

THAT practically none of our many crop plants are indigenous is a matter of common knowledge. Among the numerous agencies that have been instrumental in their introduction immigrants from agricultural areas of the old world deserve more credit than they have hitherto received. Although it is likely that many introductions have been made in this manner, it is rarely possible to trace clearly the history of an individual case. The successful introduction of South American alfalfa into California, to which we owe almost exclusively the present extension of alfalfa growing in the United States, took place about 1855.

In the spring of 1857 another strain found its way into the United States, this time from Europe. In that year there came to this country from the little village of Külsheim, near Wertheim, in the Grand Duchy of Baden, a German farmer named Wendelin Grimm. Like many of his countrymen, Grimm went west, taking up a farm in Carver County, Minn.

Among the few possessions that he brought with him from his old home was a small bag containing less than twenty pounds of seed of the alfalfa or lucerne commonly cultivated in Baden. Grimm applied numerous local names to this alfalfa, but most commonly he called it "ewiger Klee" (everlasting clover) referring to its perennial nature.

This small lot of seed was the progenitor of an alfalfa industry that has existed in Carver County, Minn., for more than a generation and which is now being extended into other parts of the cold northwest.

The South American seed found a congenial soil and climate and became the basis of a farming industry whose annual product has in half a century attained a value of about $150,000,000. The European seed, on the other hand, encountered a favorable soil but a very unfavorable climate, with the result that a long period of years was required for it to become finally established. The original