will be quite misleading, as no account is taken of the relative cost of the articles—surely an important matter in these days—but also the fact must be borne in mind that in the free consumption of cacao-products a notable amount of an alkaloid is introduced while in standard foods no such ingestion occurs. Notwithstanding the high calories and even high protein content of cacao-products we should err in regarding them as more than beverages and confections.

We are informed that while *Theobroma cacao* is the principal source of cacao-products, several other species contribute a not important share. It is satisfactory to note that while commercial conditions necessitate the use of the term "cocoa" as a name for the marketed products, the author emphasizes the fact that the correct title is "cacao" and uses this when speaking of the raw materials and also the separated fat, which is (very properly) termed "cacao-butter." Incidentally another important point is noted, namely, that the oil from the fruit of the *Cocos nucifera* should be termed "coconut oil" and not, as is often done, "cocoanut oil." For thus aiding in correct orthography Mr. Whymper deserves thanks.

The methods of cultivation, ingathering and curing are given in great detail, illustrated with many fine full-page photogravures. The machinery employed in manufacturing the several commercial preparations is also illustrated and described. Of course, the cacao plant is subject to diseases, but it is specially interesting to note that in many places its successful cultivation requires the association of other trees for shade, and that these latter sometimes communicate their diseases to the cacao nut. In this connection it is worth pointing out that it has been long known that sandalwood trees do not thrive when grown by themselves, and it was supposed that this is due to need of shade, but it has lately been proved by the investigations in India that sandalwood is a partial root-parasite. In Trinidad a particular luguminous tree is so commonly used as a shade for cacao that it is known as "Mother of Cacao."

The food chemist will find in this work a vast amount of important and interesting technologic and analytic data. The commercial forms of "cocoa" and "chocolate" are fully explained both as to preparation, composition, analytic examination and adulteration. Over one hundred pages are devoted to these topics, and the bibliography, a summary of which is given separately, covers a very wide range.

No important typographic errors have been noted. On p. 65, the date for the reference to *Chem. Zeit.* should apparently be 1897, instead of 1887.

The book is a timely and valuable contribution to the literature of an important topic.

HENRY LEFFMANN

SPECIAL ARTICLES

ELM LEAF CURL AND WOOLLY APHID OF THE APPLE

IT was with considerable astonishment while working over some elm aphids several winters ago that I found that I was unable to separate on structural characters certain collections of *Schizoneura americana* (causing and inhabiting elm leaf curl) from certain collections of *Schizoneura lanigera* (the troublesome woolly aphid of the apple). It seemed absurd to suppose that a species under such constant observation as the woolly aphid of the apple could be masquerading on our elms all these years without biological evidence of the fact having been chanced upon long ago.

However, the guess based on structural evidence, wild as it seemed, was worth following up and field observations were made during the next seasons. Spring migrants were observed to desert the elm leaves in the early summer, and fall migrants to leave the apple branches in the fall, but no conclusive data as to the destination of either were obtained in the field. Both migrations covered a rather extended time and the situation was especially complicated by the continuous presence of apterous forms on the apple (either on branch or root) all the year and of "*rileyi*" on the trunks of young elms during the summer.

This past winter preparations for a migration test under control conditions were made by raising from seed young apple trees in a greenhouse safe from any possible infestation of the "woolly aphid."

This spring elm leaf curl was obtained from the south and the emerging winged forms were caged over apple seedlings while depositing their young. As a result, the progeny, a fine lot of nymphs that are growing along creases where the thin bark is scaling back, in the axils of the leaves and on exposed roots of the apple seedlings, covered by a typical flocculent white secretion, would be pronounced "woolly aphid of the apple" by any nursery inspector.

Though several kinks in the life cycle of this important species remain to be deciphered, the synonymy of *Schizoneura lanigera* Hausman (*S. americana* Riley) is the chief step in their solution. If the American species on elm is the same as the European species, our orchard pest, the woolly aphid, will revert to the name *Schizoneura ulmi* Linn.

Extended tests for the range of food plants of this species are under way, the reception of southern specimens adding about two months to the time possible for experimentation with the progeny of the spring migrants; which as they will be treated in detail later, need not be further indicated in this preliminary note.

EDITH M. PATCH

MAINE AGRICULTURAL EXPERIMENT STATION

A METHOD FOR THE REMOVAL OF THE TOXIC PROPERTIES FROM COTTONSEED MEAL

A PRELIMINARY REPORT

IN our studies upon cottonseed meal intoxication we have used a method of treatment which has rendered the meal non-toxic to rabbits. We desire to test the treatment further with other meals and with other classes of animals, and we desire also, if these experiments result favorably to devise a method by which the treatment may be used upon a commercial scale. As it will take some time to carry out these experiments we wish to make this preliminary publication and to request others who are engaged in cottonseed meal studies to repeat our work so that the method may be thoroughly tested before being offered for use for commercial purposes.

Our experiment was as follows: 630 grams cottonseed meal previously extracted with gasoline were boiled on a water bath for two hours with 2 liters of alcohol to which had been added 40 c.c. of an aqueous solution containing 20 grams of NaOH, previous experiments having shown that this amount of NaOH was a little more than enough to combine with all the meal. The mass was filtered while hot, washed with hot alcohol and dried. 14.6 grams corresponding to 15 grams of meal were fed daily since March 18, 1912, to each of six rabbits averaging 1,992 grams in weight. These rabbits are all in good condition to-day (April 25, 1912) after 39 days' feeding, but have lost upon an average 134 grams. The feed eaten corresponds to 7.5 grams of cottonseed meal daily for each kilogram of initial weight of rabbit or a total of 292 grams per kilo for the 39 days.

Previous experiments with rabbits have shown that 7.7 grams of cottonseed meal fed daily per kilogram of initial weight of rabbit is fatal on an average after 13 days' feeding or a total of 100 grams per kilo of initial live weight. Our feed No. 189 has run for three times that period, the daily feed is practically the same and the total amount consumed is nearly three times as great. From this we conclude that the alkaline treatment very greatly diminishes if it does not entirely remove the toxic properties of the meal. This feed contains 1.70 per cent. of sodium instead of 0.04 per cent. as in the untreated meal. The beneficial effect of the alkaline treatment may be due to hydrolysis, or to the formation of a sodium salt, or to some other change not yet determined definitely.

We request that those who repeat our work follow the method closely, except to use 40 grams of NaOH instead of 20 grams.

We wish to acknowledge our obligation to Mr. R. S. Curtis, animal husbandman, and to