U. S. DEPARTMENT OF AGRICULTURE. DIVISION OF FORESTRY. BULLETIN NO. 8: SOME LITTLE-KNOWN INSECTS AFFECTING STORED VEGETABLE PRODUCTS: A COLLECTION OF ARTICLES DETAILING CERTAIN ORIGINAL OBSERVATIONS MADE UPON INSECTS OF THIS CLASS

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F. H. CHITTENDEN

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BULLETIN No. 8—NEW SERIES.

U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF ENTOMOLOGY.

SOME LITTLE-KNOWN

INSECTS AFFECTING STORED VEGETABLE PRODUCTS:

A COLLECTION OF ARTICLES DETAILING CERTAIN ORIGINAL OBSERVATIONS MADE UPON INSECTS OF THIS CLASS.

BY

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY,
Washington, D. C., January 21, 1897.

SIR: I transmit herewith the manuscript of Bulletin No. 8, new series, of this division. It consists of a collection of accounts of observations made by Mr. F. H. Chittenden in the progress of his work in the preparation of a complete report on insects affecting stored vegetable products, and its publication at this time is urged on account of the obvious desirability of an immediate record of the numerous important observations already made, as more fully explained in the preface.

Respectfully,

L. O. HOWARD,
Entomologist.

Hon. J. STERLING MORTON,
Secretary of Agriculture.

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PREFACE.

The World's Columbian Exposition, held in Chicago in 1893, served as the medium of importation of several species of insects of then imperfectly known distribution and habits, and incidentally much information was gathered from the collections made by the writer in the foreign agricultural exhibits that were displayed there. Similarly the Cotton States and International Exposition, held at Atlanta, Ga., in 1895, became the means by which knowledge of new food habits and habitat for a few species of doubtful or unknown habits and obscure origin has been gained. The material and other data obtained at the Columbian Exposition in stored products served as an impetus to the investigation of this group of insects and the living specimens in their food material obtained there, augmented by additions through correspondence and collections made in the city of Washington, have been under more or less continuous observation since. Certain of the preserved material has also received study, in connection with related forms, as time and opportunity afforded.

In the spring of 1894 the writer was directed to prepare a bulletin covering the subject of the insects affecting stored cereals. At the outset it was necessary, as a preliminary step, to properly identify the species to be considered. A number of radical changes have recently been made in the previously accepted nomenclature of these insects, involving the separation of species hitherto considered under a single name, the restoration to the species of the earliest published names, and the indication of synonyms.

Since its original inception the scope of the work has been enlarged to include insects affecting other stored products than cereals, and it has been thought advisable to compile as complete a bibliographical list of important references to each species as can be secured.

The preliminary labor involved in the preparation of such a work has consumed much time and is still in progress. It comprises the perusal of all available literature, including the indexing and digesting of numberless notes and articles, mostly scattered through periodicals and in many languages; the procuring of living specimens for rearing, and observation of the various species to be treated; the comparative study, description, and illustration of these species in all their various forms from egg to adult; the rearing and identification of parasites; the ascertainment of the character of the injury of the different species,

their range of food habit and other facts in their life history, and various other points of value and interest.

The records consulted show a present known total of between 150 and 200 species of insects that occur more or less frequently and normally in stored materials. About half of these species have been reared and observed at this office.

Certain of the more interesting and lesser-known forms have received mention in short articles and notes published in divisional bulletins and elsewhere, and the commoner species have been treated in a more popular manner in three articles, prepared, respectively, for the Yearbook of the Department of Agriculture for 1894, a Bulletin on Household Insects (Bull. No. 4, n. s.,) issued by this Division, and a Farmers' Bulletin recently published by the Department, making a total of eleven titles of publications having a bearing on this subject.

The completion of a more comprehensive bulletin is necessarily of so slow accomplishment that it has been thought desirable to bring together for publication a portion of the accumulated information on some of the more interesting new or little-known species. This matter is presented in the following ten articles, prepared in a somewhat more popular or less technical style than will be pursued in the more exhaustive work planned.

The different injurious species here considered are all amenable to similar treatment, and for the benefit of such as may not be fully informed upon this subject it should be stated that a consideration of methods of control, together with brief accounts of eighteen of the more important species affecting stored cereals, prepared by the writer by direction of the Assistant Secretary, has recently been issued as Farmers' Bulletin No. 45, by this Department, and may be had by application to the Secretary of Agriculture.

For convenience of publication it has been found necessary to group the accounts here given under a single comprehensive title. Hence it should be stated for bibliographical purposes that, although each account is not signed by the author, each should be indexed separately, as there is no connection between the different articles. Each is, to a certain extent, complete in itself, having no special bearing on either what precedes or follows it in the order given.

F. H. C.

SOME LITTLE-KNOWN INSECTS AFFECTING STORED VEGETABLE PRODUCTS.

A STOREHOUSE MOTH NEW TO THE UNITED STATES, WITH NOTES ON OTHER SPECIES.

The two or three years just passed are notable for the discovery of a number of new insect enemies to stored products of a vegetable origin to be added to the list of such species gathered by the writer at the Columbian Exposition and elsewhere and enumerated in the pages of Insect Life (Vol. VI, p. 219, etc.; VII, p. 326) and in other publications.

THE DRIED-CURRANT MOTH.

(*Ephestia cahiritella* Zell.)

Among other species obtained at both the Columbian and Cotton States expositions, and brought prominently to attention by the material collected at Atlanta, was one moth of the family Phycitidæ and genus Ephestia which manifested its presence by the work of its larva in nearly every exhibit of chocolate nuts or cacao beans. Moths were flying in numbers in a case of cacao exhibited by Jamaica at the Columbian Exposition, and a series of specimens of these and from Venezuela were secured. Specimens were also obtained from these two countries at the Atlanta Exposition.

It was obviously one of the species that are constantly being shipped to this country from abroad, but, as no food material for it other than cacao beans was known, it could not at first positively be said to be permanently located here, although such was surmised to be the case. The almost simultaneous discovery of the insect at Atlanta and in infested material from Ohio and the District of Columbia led to its study and identification.

The specimens bred did not correspond with anything in the National Museum, nor with descriptions of any species known to occur in this country. They agreed best with descriptions of *Ephestia cahiritella* and with the illustration of this species furnished in The Entomologist of 1890 (pl. 4, fig. 12), but not being quite satisfied with this tentative identification a series was sent to Mr. Edw. Meyrick, of Marlborough College, England, who has done special work in the Phycitidæ. From him word has been received to the effect that they are referable to