

and in some of the inhabited pueblos, where they are known as estufas. In them are performed many of the most sacred ceremonies of the tribe. Besides the cliff villages, however, there are hundreds of cliff dwellings in the Mancos Cañon and its branches, ranging in size from single rooms up to groups of considerable importance, in which no circular rooms are found. Many of them are on sites so inaccessible that it seems incredible that human beings should select such places for homes.

A type closely related to the cliff dwelling proper is the cave dwelling, fine examples of which are found in the Mancos Cañon and in other parts of the region. These curious habitations are hollowed out of the cliffs by digging away the soft shaly rock and then walling up the fronts. In one place in the Mancos Cañon a picturesque outstanding promontory is literally honeycombed with these dwellings, which give one the impression that they were constructed by a race of pygmies, for neither the outer apertures nor the openings between the rooms are large enough to permit a person of ordinary stature to pass through.

On the brink of the cliff above these cave dwellings is the ruin of a circular tower. These towers are found throughout the Mesa Verde country; in fact, there is hardly a half mile without the remains of one or more of them. Nowhere else do they attain the same development. In size they range from ten feet in diameter up to forty or more, with walls one to two feet in thickness still standing, in some cases to a height of over fifteen feet. They are invariably connected with other structures, usually groups of rectangular rooms, and in the finest examples the circular walls are double and even triple, the spaces between them being divided into apartments by partition walls of lighter construction. The masonry is of the highest type, the stones being dressed on the outside of the curve by pecking with a stone implement, and laid neatly in mud mortar.

It has been suggested that the circular towers were in some way connected with the peculiar rites of serpent worship, and perhaps were the repositories for the snakes used in the sacred ceremonies. In the Moki villages, to the south, where the snake dance is a biennial rite, all that part of the ceremony which precedes the public exhibition takes place in the estufas, and if the same rites prevailed in the Verde country, as seems likely, it is probable that they were performed in the circular towers.

Throughout the whole of the Verde region, in favorable localities, there are dozens of pictographs, both pecked into the rock and painted upon it. That many of these were executed by the people who built and lived in the houses now in ruins there can be no doubt. The figures are engraved or cut into the face of the rock, which has been chipped out to a depth of a quarter of an inch or more. One of the most striking groups is about six feet long, and consists of a procession of men, birds, and beasts, a general movement to the right being shown. The figures appear to be tied together in a continuous line, with smaller figures, perhaps representing dogs, above and below, while a number of men are stationed on either side as if to keep the procession in order. Doubtless the artist of long ago, who must have devoted months to his work, sought to represent some event of the highest importance to his tribe, perhaps a migration or a victory over some other people.

The illustrations are from photographs by Mr. F. H. Chapin, of the Hartford Archæological Society.

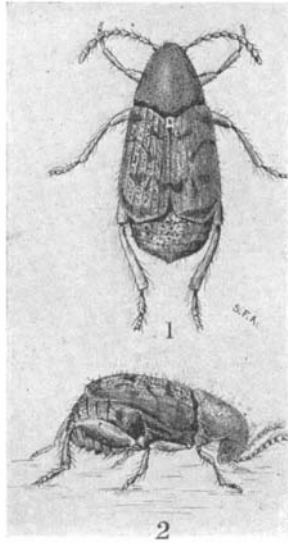
THE BEAN WEEVILS

BY S. FRANK AARON.

There are few insects that when infesting materials useful to man cannot be easily detected at all times. Only the wood borers, and certain weevils in grain, etc., are hidden during the larval stage, and the pea and bean weevils are particularly unobservable. The pea weevil attacks its chosen food only in the green, rarely, if ever, breeding in dried peas. The bean weevils breed for generation after generation in dried beans, so riddling them in time that they become a mass of holes, perhaps, indeed, more holes than beans. A recent and considerable infestation of dried beans may be detected by the somewhat dirty appearance, caused by the beetles and young larvæ cutting into the beans. When attacking green beans, there is not, except under almost microscopic examination, any evidence of the work. There are only small cuts in the pod where the eggs are deposited and minute holes where the just-hatched larvæ have bored through into the beans. So it often happens that the little weevils within are cooked or canned along with the beans and eaten all unsuspectingly. But need we really care, if such is the case? The little larva or pupa, full of nothing but bean food, is so much bean itself that it is certainly doubtful if the epicure could distinguish between a mess of bean weevil larvæ and a mess of uninfested beans similarly cooked.

The bean weevils, common and very destructive in the United States, are of two species, belonging to the

family Bruchidæ. They are allied to the snout beetles, or true weevils, the Curculios. *Bruchus quadrimaculatus* is reddish or mahogany brown with four large black spots on the wing covers and other black markings. *Bruchus obtectus*, called also *B. fabæ*, is slaty brown with somewhat obscure darker markings. The beetles of both species average about one-eighth of an inch in length. The habits of both are similar. The female cuts a slit in a green pod or dry bean and lays an egg therein, depositing many eggs thus in suitable places, but rarely more than one or two to



BRUCHUS OBTECTUS.

1. Dorsal View. 2. Lateral View.

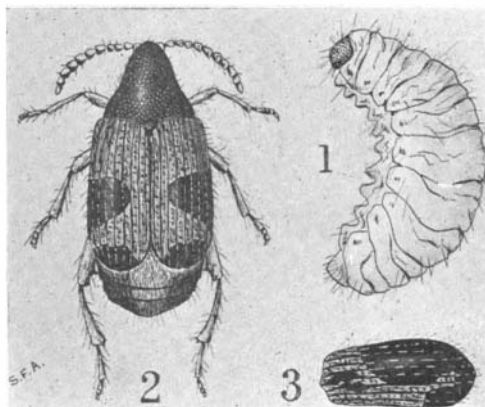
each seed. The larva hatches soon after, and at once bores its way into the bean, filling the hole behind it rather loosely with its cuttings. Thence its tunnel grows larger and larger to accommodate its increasing bulk and appetite. When full grown, and the better to permit the subsequent beetle to force its way out, the larva bores to the inner surface of the thin skin of the bean, leaving that intact for the protection of its transformations. Then it changes into the pupa stage and later into the fully developed beetle, which on emerging cuts open the thin, semi-transparent skin at the end of the burrow and escapes, leaving the boring exposed. Beans with holes are a sure indica-



THE WORK OF WEEVILS IN BEANS.

tion of having been infested by this insect. Sometimes in the very large varieties of beans several holes, the work of one generation, may be observed.

Little has been ascertained as to the means of checking the ravages of this insect. There is no sure way by which they can be prevented from attacking growing beans. Insecticides are here valueless. But when the insects are found in dry beans they can be killed and general infestation prevented by fumigation with carbon bisulphide in tight bins or barrels, or by subjecting the beans to a dry heat of about 150 deg. F. for several hours. Infested beans cannot be successfully used for planting as they produce sickly plants,



BRUCHUS QUADRIMACULATUS.

1. Larva. 2. Beetle, Dorsal View. 3. Wing Cover.

and when a general infestation has taken place the beans had better be burned or effectually destroyed, thus rendering subsequent crops less in danger of attack.

Opening of the Pan-American Exposition.

The Pan-American Exposition opened quietly on May 1, without the usual ceremonies, which are reserved for the formal dedication on May 20. In a

short time the Exposition will be entirely completed, and even at the present time the showing is an interesting one. In connection with the Exposition, we have opened a new office in Buffalo, Room 577, Ellicott Square Building, which is in charge of Mr. F. J. Wagner, our advertising representative for the Central States. All manufacturers and advertisers are requested to call upon Mr. Wagner at some time during their sojourn in Buffalo.

Our Special Pan-American Edition.

There is no doubt that the Pan-American Exposition at Buffalo this summer will attract thousands of travelers and buyers from Spanish-America and even from such distant lands as Japan, China and India.

Recognizing that these travelers could be benefited by a species of guide, which would give the various routes of travel to and from their homes and Buffalo, we have decided to issue a special number of our Export Edition in the early part of June, devoted to the interests of this Exposition along the lines already indicated.

As soon as our intention became known, we found that such a special edition would be most acceptable throughout the countries reached by our Export Edition. So hearty have the responses been to our tentative efforts that we can confidently assure our advertisers that the circulation of this special number will be at least double the present and already large circulation of our Export Edition. We believe that advertising in this issue will bring most excellent results, inasmuch as each copy reaching the hands of influential importers and buyers abroad will be kept as a ready reference guide to the Buffalo Exposition, and will therefore become a directory of American manufacturers advertised in its columns.

Our advertising pages have already felt the effects of our first essays at securing advertising on the strength of this special edition, and we urge our patrons and intending advertisers to secure the space in this edition as soon as possible, as, owing to the large number of copies to be issued, as well as the large amount of advertising matter to be handled, we expect to be obliged to close our forms at an earlier date than usual. For this one issue, we will allow advertisers to sign contracts for one insertion at special rates, to be furnished on application, either from our agencies or directly from this office.

We hope that many manufacturers who do not make a practice of advertising in regular publications will make a trial of one insertion in this special edition as we feel confident that the large circulation which will be given to their advertisement will be conducive to their using the advertising columns of our publication regularly thereafter.

We should be pleased to enter into correspondence on this subject with all manufacturers interested, and ask their co-operation, with any suggestions which they may think advisable for such a special edition.

The Current Supplement.

Among the articles in the current SUPPLEMENT, No. 1323, which should be of interest are a biography of America's Nestor of engineers, Charles H. Haswell; an article on the "Prospects of Automobiling," by M. C. Krarup, and an account of Suter's airship, in which the inventor nearly lost his life. "A Petroleum Turbine" is the title of an illustrated article which should be of no small value to those interested in the development of the explosion-engine. In his description of the "Great Salt Lake," Prof. Ralph S. Tarr tells much that is not generally known. Some curious animals provided with queer teeth are described by Mr. R. Lydekker in an article on "Living Millstones." Inspector Rice P. Steddom has much valuable information to convey pertaining to the cattle of Porto Rico. "Destructive Insects and Insects as Etiological Factors in Disease" is the title of a lecture delivered by Prof. Henry Skinner, M. D. Illustrations and an account of a process of long-distance radiography are also presented in the SUPPLEMENT. Prof. Charles F. Holder tells, in an interesting way, something of the way in which Californians move large palms. The usual consular notes, formulas, etc., will be found in their customary places.

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