

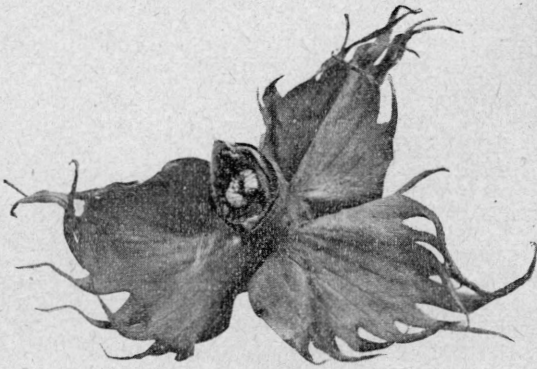
# TEXAS AGRICULTURAL EXPERIMENT STATIONS

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BULLETIN NO. 74.

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## INSECTS MISTAKEN FOR THE MEXICAN COTTON BOLL WEEVIL



*September, 1904.*

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# INSECTS MISTAKEN FOR THE MEXICAN COTTON BOLL WEEVIL.\*

By E. DWIGHT SANDERSON,  
ENTOMOLOGIST.

Owing to the large number of insects mistaken for the Cotton Boll Weevil sent us for determination, the following bulletin has been prepared to describe the more common of these insects, their habits, and how they may be distinguished from the Boll Weevil.

## THE COTTON BOLL WEEVIL DESCRIBED. (*Anthonomus grandis* Boh.)

The Boll Weevil belongs to the family of Snout Beetles or Weevils known technically as the *Curculionidæ*. It is an elephant-shaped beetle of the general appearance shown in Figure 1 and Fig. 13 *f*, enlarged about five times. It is quite variable in size, as shown in Figure 1, which illustrates a series natural size, some fully twice as large as others, being from one-eighth to about one-fourth of an inch long from the tip of the wing covers to the base of the snout. The snout is about one-half the length of the body. The color is also quite variable. Just after emerging the weevils are usually lighter than when older. Many are light brown, others deep reddish-brown, while some are decidedly grayish. Usually a narrow line along the middle of the thorax is lighter. In size and coloration the boll weevil so

closely resembles so many other common weevils that one unfamiliar with it could not distinguish it. There is, however, a structural character which with the aid of a simple hand lens, will



Figure 2. Fore-legs of various weevils showing teeth on femora; *a*, of the Boll Weevil, having two teeth on femora; *b*, Plum Gouger; *c*, *Chalcodermus aeneus*; *d*, *Balaninus* sp.

\* I am greatly indebted to Mr. E. A. Schwarz and Mr. F. H. Chittenden of the Bureau of Entomology U. S. Department of Agriculture, and Maj. Thos. L. Casey, U. S. A., St. Louis, Mo., for the determination of most of the species.

enable anyone to determine the Boll Weevil in practically all cases. At the tip of the fore femora or shanks (the basal segment of the fore legs) are two small but distinct teeth as shown in Figure 2a. The inner tooth is the larger and the smaller is hidden when the next segment of the leg is folded back, so that the leg must be straightened out to see it. All the other common species of weevils have either but one tooth in this position or none at all, as shown in Figure 2.\*

As the Boll Weevil feeds and breeds only on cotton, any insect found working on any other plant is undoubtedly not the Boll Weevil, though various other weevils are sometimes found on cotton.

#### WEEVILS FOUND IN STEMS OR TWIGS, UNDER BARK, AND IN WOOD.

**BLOODWEED OR HORSEWEED WEEVIL.** (*Lixus sylvius* Boh., *L. laesicollis*, et al.) During the winter a blackish weevil nearly half an inch long is found very commonly in the hollow stems of the so-called "Bloodweed" or "Horseweed" (*Erigeron canadense* Linn.) together with larvae and pupae. The weevils emerge in March and April in large numbers and are very evident. They are from  $\frac{3}{8}$  to  $\frac{1}{2}$  inch long, dark brownish black or shining black, the brownish tinge being due to an irregular covering of soft, brown hairs. The beak is about one-fourth the length of the body, short and stout. The weevils lay their eggs in the stalks and the larvæ burrow in the soft pith, as shown in Figure 3. Several species of this genus have been sent us, but principally *L. sylvius*; concerning the habits of the other species we are not positive. Specimens have been received from throughout that part of the State north and east of College Station. The species was originally described from Pennsylvania.

**THE NETTLE STALK WEEVIL.** (*Trichobaris texana* Lec.) This weevil is found in all stages in the stalk of the "Nettle" or "Spanish Thistle" (*Solanum rostratum*). The weevil is about one-fifth of an inch long, rather rounded oblong in outline with the beak curved under the body and reaching to between the fore legs. The color is a solid gray due to a dense covering of gray scales over the black body. The head, shoulders, scutellum and antennæ are black. The fore-femora are without teeth at tip. Larvæ, pupæ and adults are often found in the dead nettle stalks in the winter. The round exit holes marking where the weevils have left them can be observed on any dead nettle stalks. This weevil is common throughout the cotton growing area of Texas. A nearly allied species (*Trichobaris trinotata*) bores in the stems of potatoes and is often a very serious pest, as is another of the same genus (*T. mucorea*) which has been very injurious by boring tobacco stems at Willis, Texas. *T. texana* will bear watching, therefore, for fear its taste might become accustomed to some cultivated crop.

\* See Revision of the Anthomini of North America, Wm. G. Dietz, M. D. Trans. Amer. Entomological Society, Vol. XVIII, page 205. But three other species of *Anthonomus* have the fore-femora bidentate as far as described. Two of these, *galaris* Lec. and *virgo* Dietz are not known to occur in Texas, while *rufipennis* Lec. is uniformly smaller and is not common in Texas, no specimens of it having been secured.

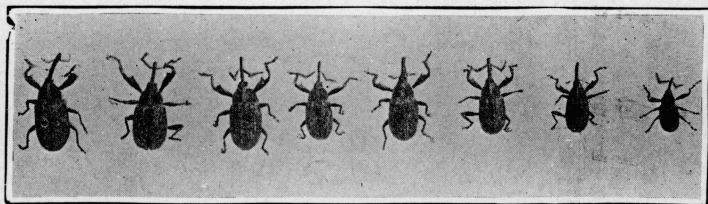
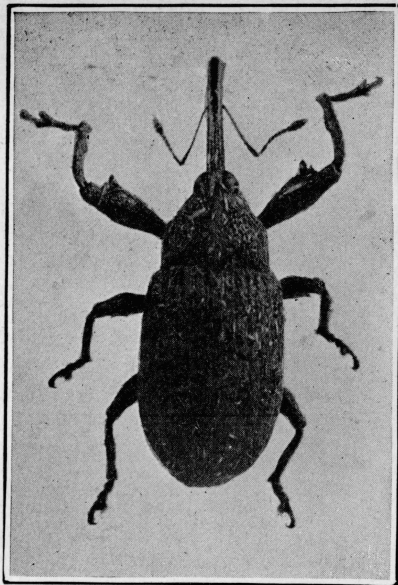


FIGURE 1.

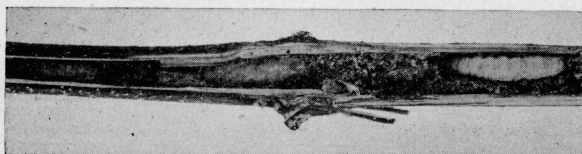
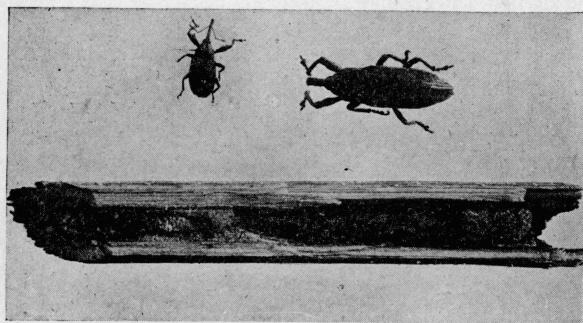


FIGURE 3.

Figure 1. The Mexican Cotton Boll Weevil (*Anthonomus grandis* Boh.) Below a series one and one-half natural size, showing variation in size; above, a weevil seven times natural size.

Figure 3. The Blood Weed Weevil (*Lixus sylvius* Boh.) At top, Blood Weed Weevil slightly enlarged at right, and Boll Weevil at left; weevil in hollow stalk; below, larvæ and pupa in stalk.



FIGURE 5—  
The White Pine  
Weevil, hair  
line at the left  
shows length  
of natural size.  
(After Pack-  
ard.)

#### THE WHITE PINE WEEVIL. (*Pissodes strobi* Peck.)

An oblong oval, rather narrow weevil, about one-quarter of an inch long, of a dark chestnut-brown color, with two dots on the thorax, a dot at the anterior end of each wing, and a short irregular cross band just back of the center of the wing covers, white or light yellowish, and with the wing covers also variegated with some patches of tawny yellow. It is frequently found under pine bark or on pine logs. It deposits its eggs in the tips of the top shoots of young trees. The larvæ mine in the wood and pith of these terminals causing the shoots to wither and die and therefore becoming stunted and crooked.

This insect is common from Lake Superior and Maine to Florida and Texas. It has been sent us mostly from East Texas where pine is plentiful.

**THE PALES WEEVIL.** (*Hylobius pales* Hbst.) This is also a pine pest. It is a "large dark chestnut-colored or black weevil three to four-tenths (3 to 4-10) an inch long, sprinkled over more or less with dots, whereof one on the middle of the outer side of the wing covers is more bright, these dots being formed by fine, short, yellowish-gray hairs. Quite common in May and June among pine trees, and in millyards, and on piles of pine lumber; with its long cylindrical snout perforating the bark and crowding an egg into the hole, the larva from which, similar in its appearance to that of the White Pine Weevil, burrows beneath the bark, loosening it from the wood." (Packard.)

**THE COTTONWOOD WEEVIL.** (*Dorytomus mucidus* Say.) This weevil is frequently taken from under the bark of cottonwood trees in winter and spring. Leconte and Horn quote Dr. C. V. Riley as authority for its breeding in the blossoms of cottonwood quite rapidly. It is shown in Figure 4, *d*, is about one-fifth (1-5) an inch long, brown, flecked with black; snout straight, projecting forward, one-half as long as body, fore-femora with a single very small tooth. This species has been found in Canada, Kansas, and California. We have also received what seems to be the same species from soil in fields grown up near woods. Other species of this genus work on willow. *D. brevisetosus* var. Csy. and *D. rufus* Say also occur here.

**THE ELM-BORING SNOOT BEETLE.** (*Magdalis armicollis* Say.) An elongate, black—sometimes brown or reddish—weevil, about one-fourth ( $\frac{1}{4}$ ) an inch long with slightly curved snout, somewhat over one-third the length of the body, the fore femora with a single sharp tooth. These beetles burrow just underneath the bark of dead and dying elm limbs. Specimens have been received from Howe, Texas, numerous on a window, March 22, 1904. The species has been recorded from Michigan, Illinois, and Kentucky.

THE SNOWY TREE CRICKET. (*Oecanthus niveus* De G.) Upon examining a cotton stalk in winter long irregular scars will often be found on it. By splitting open the stalk at such points a row of elongate, slightly curved, yellowish eggs are found. These have often been mistaken for eggs of the Boll Weevil. They are laid in cotton, all sorts of weeds, raspberry and blackberry canes, and tender fruit tree twigs, and to the latter are often injurious. The adult tree crickets are delicate yellowish-green insects about one-half ( $\frac{1}{2}$ ) an inch long, of the general appearance shown in Figure 6. They are commonly found on all sorts of weeds and trees. During the day they are quiet, but at night become active and the males make a shrill call by a stridulation of the wings. The adults feed partly on soft-bodied insects, principally plant lice, so that they are doubtless more beneficial than injurious in the cotton field, as the eggs do no particular harm. When laid in blackberry canes or fruit tree twigs the twigs usually die beyond that point, in which case they should be cut off and burned.

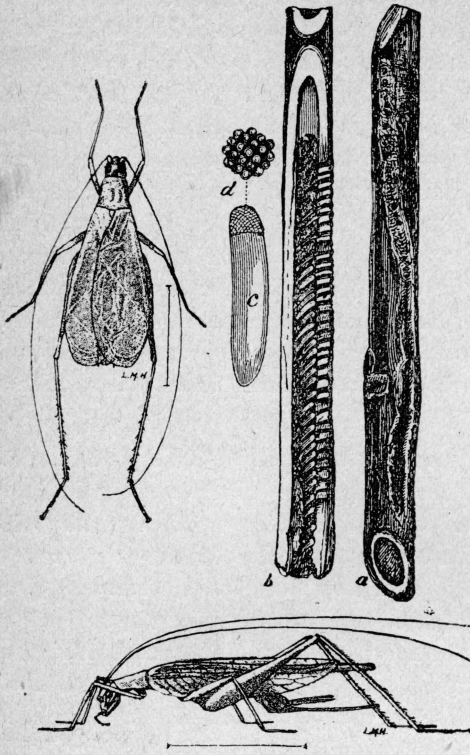


FIGURE 6—The Snowy Tree Cricket: at left, male, and below female; hair lines showing length natural size; *a*, twig showing scar from egg punctures; *b*, section of twig showing eggs; *c*, egg greatly enlarged. (After Riley and Lugger.)

twigs the twigs usually die beyond that point, in which case they should be cut off and burned.

### THE PLUM WEEVILS.\*

Both the Plum Curculio and Plum Gouger do serious injury to young plums wherever grown in Texas. With the migration of the Cotton Boll Weevil many people in localities where it has not previously occurred have mistaken these two plum weevils for it, and consequently we have had numerous reports in the daily press and many specimens sent us of supposed Cotton Boll Weevils breeding in plums. Most of this misunderstanding is due to a comparison of the grubs or larvæ within the plums with those of the Boll Weevil. These are very similar and difficult to distinguish away from the food plant.

\*For more detailed description of habits and methods of combating see Circular 6 of this office which may be had on application.

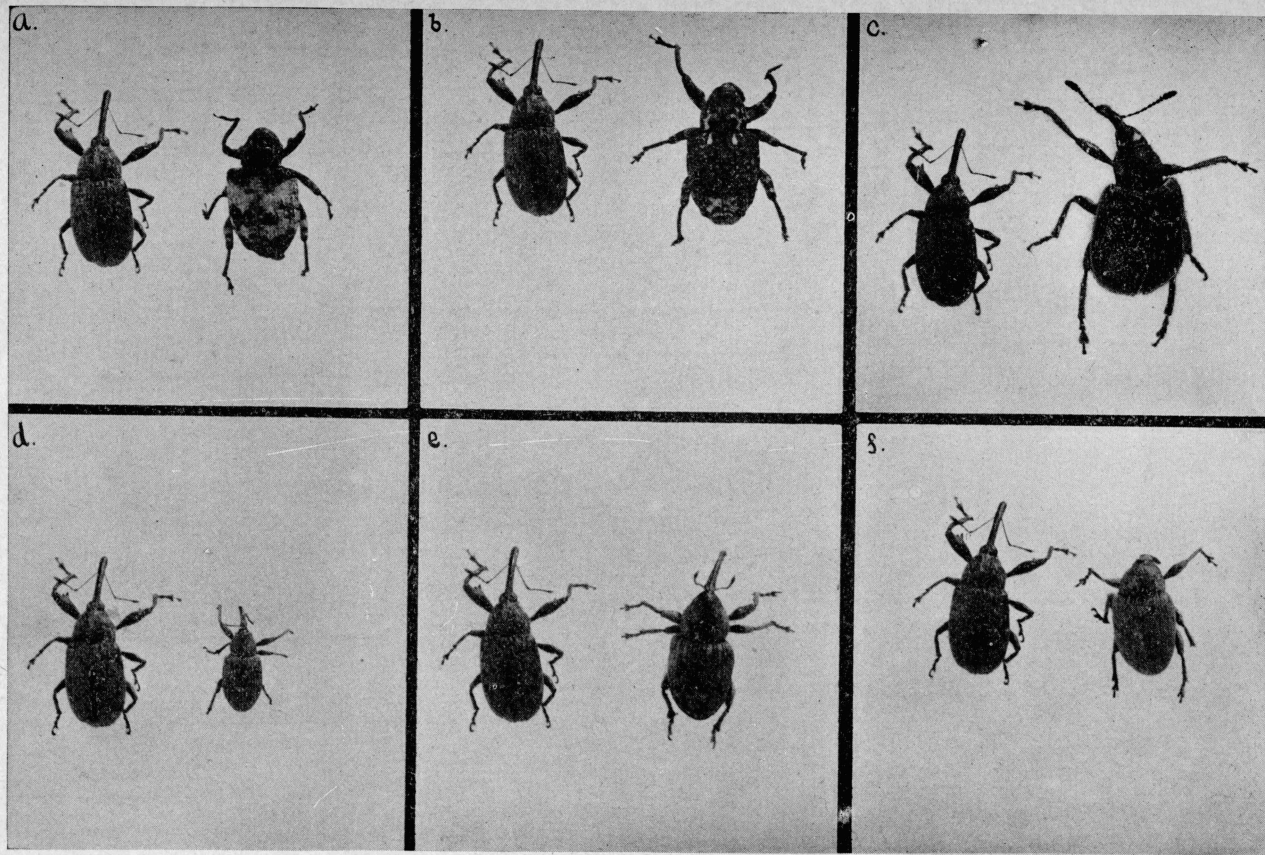


Figure 4 At the left of each pair is a Boll Weevil,  $2\frac{1}{2}$  times natural size. The weevils at the right are—*a*, *Conotrachelus leucophatus*; *b*, the Plum Curculio (*Conotrachelus nenuphar*); *c*, *Rhynchites aeneus*; *d*, the Sunflower Weevil (*Smicronyx constrictus*); *e*, the "Iron Weed" Weevil (*Desmorisus scapalis*); *f*, the False Indigo Weevil (*Tychius sordidus*).



But if the adult weevils are compared, those in plums are seen to be quite different from the Cotton Boll Weevil, though the Plum Gouger is nearly related to it and bears quite a close resemblance.

**THE PLUM CURCULIO.** (*Conotrachelus nenuphar* Hbst.) Fig. 4, *b*. The Plum Curculio is probably the most generally injurious of all plum insects. It is a native insect and occurs commonly east of the Rocky Mountains. The adult weevil is about one-fifth ( $\frac{1}{5}$ ) an inch in length, of a dark brown color, marked with spots of white, ochre-yellow, and black. It may be readily distinguished from the Plum Gouger and most other weevils by the two prominent black tubercles or humps on the wing covers, one on either side of the median line; behind these is a band of dull yellow and white. The wing-covers are also prominently ridged lengthwise. When disturbed the Curculio like most weevils, has the habit of drawing up its legs, bending its snout on its breast, and feigning death or "sulling," dropping to the ground. It is then very difficult to distinguish from a bit of bark or earth, particularly if lying upon them.

The Curculios hibernate over winter, emerge in the spring, and feed somewhat on the tender terminals, then deposit their eggs in the young plums, making a characteristic crescent-shaped mark on the surface where each egg is inserted. The larvæ feed within the plums causing them to drop, when full grown enter the earth where they change to pupæ, which transform to adult weevils in midsummer. But one brood occurs in a year.

**THE PLUM GOUGER OR PLUM PIT WEEVIL.** (*Coccotorus prunicida* Walsh.) Figure 7, *b*. This insect is common throughout the Mississippi Valley, but seems to be injurious mostly west of the Mississippi. It is a native insect, feeding on wild plums and doing worse injury to native varieties. The adult beetle may be readily distinguished from the Curculio by its lacking the humps or tubercles on the wing-covers. It is about one-fourth ( $\frac{1}{4}$ ) an inch long, with a rather long, curved snout. The wing-covers are of a leaden-gray color, finely spotted with brown and black, while the thorax and head are marked with ochreous yellow. It is considerably larger than the Cotton Boll Weevil, is of a darker color, and the Boll Weevil has no yellow markings.

The eggs are laid in cavities hollowed out by the weevils and the larvæ bore into the pits of the plums, in which the pupal stage occurs, and from which the weevils emerge through round holes. The injury does not cause the fruit to drop. Frequently the weevils feed on the plums, causing a gummy exudation.

Belonging to the same genus as the Plum Curculio is *Conotrachelus naso* Lec. Figure 7, *c*. This has elsewhere been bred from the fruit of the Haw (*Crataegus*) and a correspondent states that he has reared it from larvæ in acorns of Post Oak. The weevil is nearly one-fourth ( $\frac{1}{4}$ ) an inch long, blackish brown, thinly clothed with brownish hairs, the wing-covers slightly ridged, and the fore-femora with an obtuse tooth, the snout curved under. It was described from Georgia and Texas and we have received it from various points, mostly in North Texas. It quite closely resembles the Boll Weevil in size and general coloration,

but can be distinguished, as shown in the figure, by the wing covers being flecked with small light brown and blackish spots.

Another species of this genus, *Conotrachelus leucophætus* Fahr., breeds in the Careless Weed (*Amaranthus*) and is quite readily recognized by the prominent white markings, Figure 4, *a*. It is slightly smaller than the last species, the snout is short and cylindrical, reaching to between the base of the fore legs, all the femora have a single tooth, the surface of the wing covers is in great part covered with white hairs to within one-fourth of the tip, which is dark brown and mottled. This species occurs in Texas and Mexico. We have frequently found the weevils on corn and it is a not uncommon species. It is recorded as feeding on beets in Colorado.

THE FALSE-INDIGO WEEVIL. (*Tychius sordidus* Lec.) Fig. 4, *f*. One of the first weevils to appear in the spring in large numbers is this one which breeds upon the seed pods of the False Indigo plant or "Buckweed" (*Baptisia bracteata* Ell). As this weed is very common and has a striking flower, the weevils are readily noticed and have caused much consternation due to their being mistaken for the Boll Weevil. This little weevil is about three-sixteenths ( $\frac{3}{16}$ ) an inch long, with snout projecting downward, about one-third the length of the body, of a rounded oval shape, usually light gray, due to the black body being thickly covered with grayish scales, which form a lighter line along the middle of the back, and when rubbed off or immersed in water becoming black; femora without teeth. The weevils lay their eggs in the seed pods as soon as the blossoms fall and the larvæ work in the seeds in a manner much similar to the Bean Weevil. There seems to be but one brood in a year. The species occurs throughout the greater part of the cotton area of the State and was originally described from Illinois.

Another very small species of this genus, *Tychius sulcatulus* Csy., scarcely over one-twentieth ( $\frac{1}{20}$ ) an inch long, and resembling the above species in miniature has been sent us from Paint Rock, Texas, where it was found abundant in prairie grass.

THE IRONWEED WEEVIL. (*Desmoris scapalis* Lec.) In June there appears on the so-called Ironweed (*Grindellia squarrosa*) a weevil which in shape and color very closely resembles the Boll Weevil, see Figure 4, *e*. It is three-sixteenths ( $\frac{3}{16}$ ) to one-fourth ( $\frac{1}{4}$ ) an inch long, with beak half as long, of a dark reddish-brown color, with the abdomen marked with broken whitish stripes; the femora have no teeth, but are strongly clavate. The immature stages have not been observed. The species was first described from Kansas and has been sent us from North Texas.

THE SUNFLOWER WEEVIL (*Smicronyx constrictus* Say) Fig. 4, *b*. Throughout the summer there is found on the sunflower a small grayish to blackish weevil, about one-eighth ( $\frac{1}{8}$ ) an inch long, beak one-

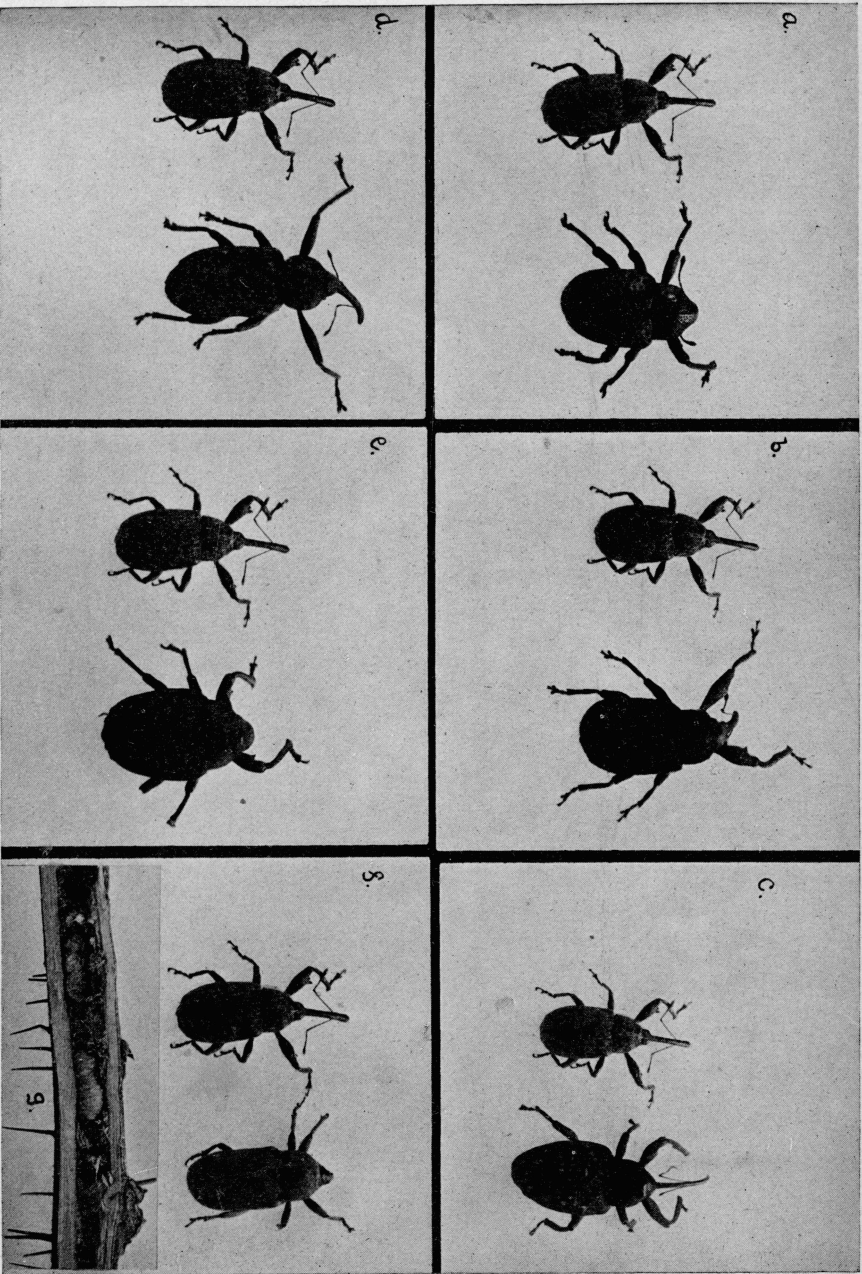


Figure 7. At left of each pair is a Boll Weevil,  $2\frac{1}{2}$  times natural size. At right a *a*, *Chalcodermus areolaris*; *b*, the Plum G urer, (*Carolinus prunicola*); *c*, *Conotrachelus nasei*; *d*, the Cottonwood Weevil (*Dorytomus mucidus*); *e*, (*Abyssenatus p. imucollis*); *f*, the Nettle Stalk Weevil (*Tyritoborhis texana*) with larva and pupa in hollow stalk below.

fourth length of body, held forward, the femora without teeth, the body uniformly covered with gray scales which rub off leaving it more or less shining black. This species is very abundant. It was originally described from Kansas and Missouri, and has been received from many points in North Texas.

A smaller species closely resembling the latter, but with snout much shorter and stouter, and antennæ more clubbed, is *Macrorrhopus estriatus* Lec., which has been received from Battle, Texas, May 27, 1903. It has also been taken in California.

### SUPPOSED BOLL WEEVILS FOUND ON THE COTTON PLANT.

During the summer several insects are common on cotton squares and are commonly mistaken for the Boll Weevil.

**THE COW-PEA POD WEEVIL.** (*Chalcodermus æneus* Boh.) Figure 7a. This is a shining black, stout, robust weevil, about three-sixteenths (3-16) an inch long. It is often brownish-black and with a slight metallic lustre; the body and wing-covers are very closely and deeply pitted, the fore-femora with a single tooth, snout one-third the length of the body and bent under. It is common on cotton squares and cowpeas, having been reared by Mr. Chittenden from the latter. It may sometimes feed in the square but we have no good evidence that it ever breeds on cotton, though it occasionally does considerable injury as reported in Georgia this season. Being associated with the Boll Weevil, the injury in Texas is probably usually due to the latter. We have received it from North and East Texas and Louisiana.

*Notoxus calcaratus* Horn. Figure 8. This interesting little insect is not a weevil, though the large horn-like process extending forward from the thorax over the head looks something like a snout at first glance. Its general shape is well shown in the figure which is six times natural size. The beetle is about three sixteenths (3-16) an inch long, reddish-brown, covered with grayish scales and hairs, except a broad band across the center and a narrow band across the tip of the wing-covers and a small spot on the front of each wing-cover; a large flattened horn projects forward from the thorax over the head which is bent down vertically, numerous erect hairs and bristles over the entire body. This beetle is very common in and at the base of cotton squares, and has been frequently reported as injuring them by gnawing the stem just at the base of the square and causing it to drop. We have not been able to confirm this report, but it seems quite possible, though we doubt that the injury is serious. This and a nearly allied species have been known to injure fruit by boring into it in California, and *Notoxus ancharago* is recorded as injuring cherries in Northern Michigan. Riley and Howard state that it feeds on cotton flowers, probably on pollen (Insect Life, Vol. V, p. 197) so that it is quite possible it may sometimes injure the squares.

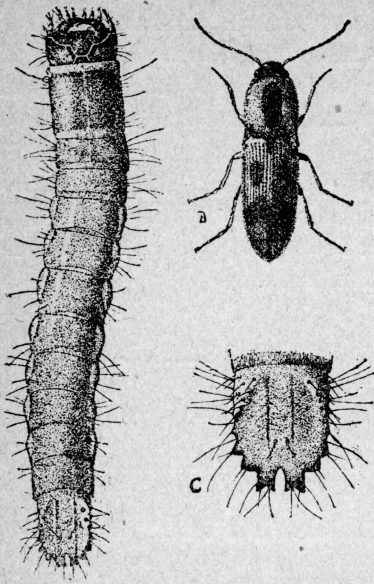


FIGURE 9—The Spotted Click Beetle (*Drasterias elegans*); at left, larva enlarged six times; *b*, beetle twice natural size; *c*, terminal segment of larva greatly enlarged. (After Forbes.)

THE SPOTTED CLICK BEETLE (*Drasterias elegans* Fabr.) Fig. 9. This little click beetle is a very common inhabitant of cotton squares and blossoms, where it probably feeds on the pollen and nectar, but we are inclined to the belief that its supposed injury is much exaggerated. The larva of this beetle is one of the most common "wireworms," so injurious by drilling holes into seed corn soon after it is planted and also injuring other grains and vegetables. The beetles are about one-third ( $\frac{1}{3}$ ) an inch long and of a rusty-brown color, with black markings as shown in the illustration. A very similar species (*Monocrepidius vespertinus*) is even more common than the above and is often very common.

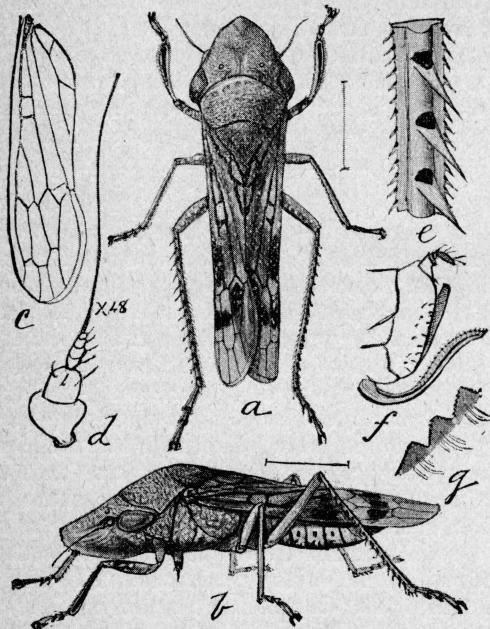


FIGURE 10—The Cotton Sharpshooter. (*Homalodisca triquetra*) *a*, female adult seen from above; *b*, same, side view; *c*, venation of fore wing enlarged; *d*, antenna; *e*, section of hind tibia; *f*, female genitalia, still more enlarged; *g*, serrations of ovipositor, still more enlarged. (After Howard, U. S. Dept. Agr)

THE "SHARPSHOOTER" (*Homalodisca triquetra* Fabr.) Fig. 10. This insect is well known to most cotton planters and is the supposed cause of much injury by sucking the stem of the square and causing it to drop. Opinion seems to differ on this point however, and lacking careful observations, the exact amount of injury is still in doubt. The adults are found very abundant on sorghum, sunflowers and bananas and more commonly on cottonwood, sycamore, willow, elm, hackberry, and various large weeds, principally "Horse-weed." They sometimes lay their eggs and the young are often found on cotton, but usually the eggs

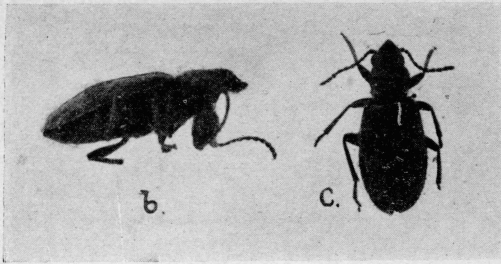


FIGURE 8.

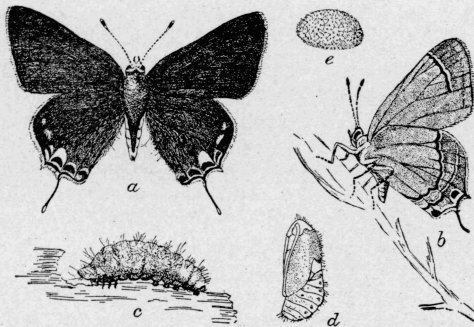


FIGURE 11.

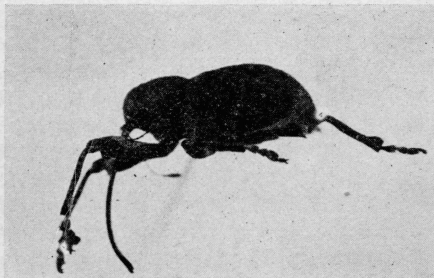


FIGURE 12.

Figure 8. *Notoxus calcaratus*, side and back view, five times natural size.

Figure 11. The Cotton Square Borer (*Uranotes melinus*); *a*, butterfly; *b*, underwing; *c*, larva; *d*, pupa; *e*, egg—all slightly enlarged. (After Howard & Chittenden, U. S. Dept. Agr.)

Figure 12. An Acorn Weevil (*Balaninus nasicus*); side and back view.

are placed in the leaves or leaf stems or stalks of weeds or the trees above mentioned. The adults lay close to the stem and upon the slightest disturbance dodge to the other side so that they are not noticed unless looked for. They give off quite regularly drops of liquid similar to that excreted by plant lice. The adults are about one-half ( $\frac{1}{2}$ ) an inch long, the head reddish-brown, wing-covers smoky with a broad whitish band before the middle and a red spot toward the tip, head and thorax orange underneath. The species occurs throughout the Gulf States and has been recorded on a number of other food plants. No practical means of combating it have been attempted, but we are now making an investigation of its life and means of control.

**LEAF BUGS.** A number of species of common leaf bugs including the so-called Cotton Stainer (*Dysdercus suturellus*) and *Largus succinctus*, are common upon cotton squares and bolls and are sometimes thought to be the Boll Weevil. The former is about one-half an inch long, reddish or orange colored with black margins or markings, while the latter is deep bluish with orange or red margins, and have a sucking beak bent under the head between the legs. They are sometimes injurious to cotton bolls.

*Rhynchites æneus* Boh. Fig. 4, c. This rather striking weevil has been sent us from North Texas, where it was found on cotton flowers and was supposed to be feeding on the Boll Worm, which is hardly probable. It is a shining bronzed-black weevil, one-fourth ( $\frac{1}{4}$ ) an inch long, with snout one-third as long, held forward and downward, broader at tip, the body with numerous coarse black hairs and the femora without teeth. It is found throughout the Middle, Southern, and Western States to Colorado. A nearly allied species, *R. bicolor*, is known to injure rose flowers, so that the occurrence of this species on cotton flowers is not surprising. No particular injury by it has been reported.

**THE COTTON SQUARE-BORER** (*Uranotes melinus* Hubn.) Fig. 11, Plate IV. The larva of this dainty little butterfly is a small, flattened, oval, green caterpillar, with the head hardly visible above, and of a slug-like appearance, which bores into the cotton squares and stalks. Often one larva will destroy all the squares on a stalk knee-high. Its work resembles that of the Boll Worm for which it is sometimes mistaken as well as for the Boll Weevil. Another nearly related species, *Calycopsis cecrops* Fabr., has similar habits. The former species also breeds on cowpeas, beans, hops and various other plants. It seems to prefer cowpeas to cotton. Fortunately, these larvæ are severely parasitized so that but little injury occurs after June. In some localities this insect seems to have been injurious for years, while elsewhere it has but recently been noticed as injurious. All stages are shown in the illustration. The butterflies are common in cotton fields and along edges of thickets. On the upper surface they are slaty-black, and at the tip of the hind wings is a black spot crowned with crimson between the basis of the two short tails. Where the butterflies are numerous in early spring and injury seems probable, we would suggest that dusting or spraying with arsenicals be tried, as the young larvæ would naturally be poisoned as are those of the Boll Worm.

## THE ACORN WEEVILS.

Late in the summer large numbers of weevils often fly to lights and are thought to be the Boll Weevil. These are mostly various species of Acorn Weevils, similar to the one shown in Figure 12. The species figured (*Balaninus nasicus* Say) has the snout somewhat longer than the more common species, but in all of them it is much longer and more slender than that of the Boll Weevil, as are also the antennæ or feelers attached to it. These weevils lay their eggs in acorns in the fall. When full grown the larvæ leave the acorns, enter the ground, where they change to pupæ which transform to adult weevils and emerge the next summer. Several species are commonly sent us which are difficult to distinguish. Of these, *Balaninus nasicus*, *quercus* and *uniformis* breed in acorns, *B. victoriensis* Chitt. in live oak acorns, and the food of *B. undulatus* Csy. is unknown to us. Other species breed in pecan, hickory, and chestnuts. All of the species are widely distributed. The various species are from one-fourth ( $\frac{1}{4}$ ) to one-third ( $\frac{1}{3}$ ) of an inch long and mottled grayish or tawny in color.

## MISCELLANEOUS WEEVILS.

THE PRICKLY PEAR WEEVIL. (*Acalles turbidus* Lec.) In the spring a mottled brown weevil about three-tenths ( $\frac{3}{10}$ ) of an inch long is found in cavities made by it in the prickly pear (*Opuntia*). These weevils breed in the prickly pear, laying their eggs in spots injured by a fly maggot, according to Mr. E. A. Schwarz. The larva hollows out the inside of the leaf and in the fall makes a loose cocoon of the chippings in which it transforms to the pupa, from which the weevil emerges in the spring. The species is common through South and West Texas and was first described from Arizona.

*Rhysematus palmarcollis* Say. Figure 7, e. One-fifth ( $\frac{1}{5}$ ) an inch long, snout as long as head and thorax, bent vertically downward, body black, thorax sculptured with fine ridges converging backwards towards the middle, each wing with four prominent ridges between which are two rows of distinct elongate punctures or pits, wing-covers flecked with brown scales, not noticeable to the naked eye. This weevil seems to be common in Texas, but we have learned nothing of its habits. It is recorded as bred from a fungous gall on the Gopher Vine (*Ipomea pandurata*) in Ohio by Prof. F. M. Webster.

*Phacepholis elegans* Lec. Body metallic greenish or bluish, shining through a covering of brownish scales, stout, two to three-tenths ( $\frac{2}{10}$  to  $\frac{3}{10}$ ) an inch long, beak very short and thick, not longer than head, femora without teeth, under side metallic purplish-black with brown scales. This species has been received from Hare and Taylor, Texas, and is not uncommon. It was first described as occurring from Kansas to Texas. No record of its food habits are found.

*Baris transversa* Say. A small smooth, rectangular, black weevil, two-tenths ( $\frac{2}{10}$ ) an inch long, snout stout, short, bent downward.



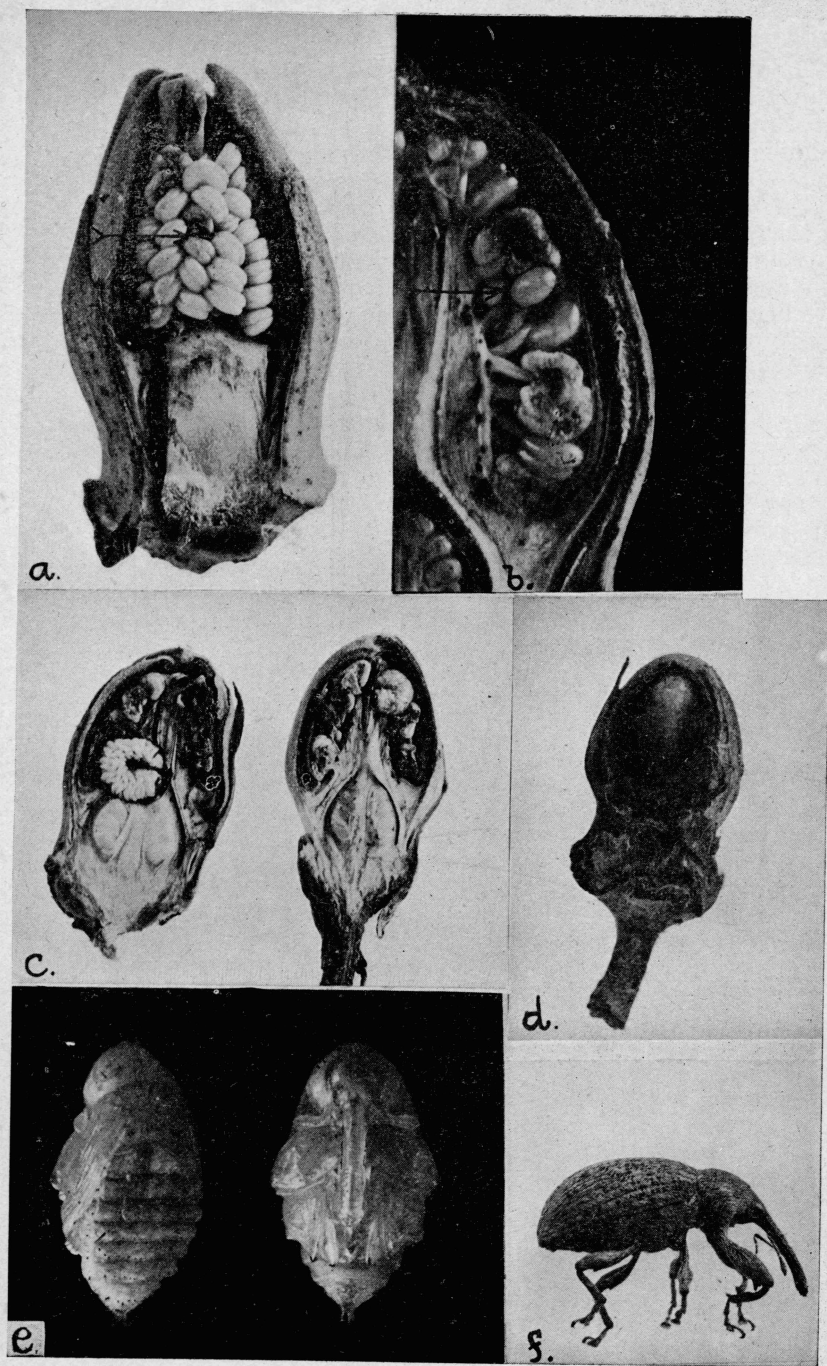


Figure 13. The Cotton Boll Weevil: *a*, cotton square with side removed, showing egg among anthers at —; *b*, the same more enlarged in cross section, showing hole through wall of square; *c*, larvæ in squares; *d*, pupa in square; *e*, upper and under side of pupa; *f*, weevil from side—all greatly enlarged, *e* and *f* five times natural size.

Occurs in Michigan, Illinois, Kansas and Arizona. Received from Malakoff, Texas.

In addition to these species there are many others not so common which are mistaken for the Boll Weevil, among them two unidentified species of the same genus to which it belongs, *Anthonomus*, but much smaller. In fact almost any snout beetle may be mistaken for the Boll Weevil, and there are hundreds of different kinds belonging to this group of beetles.