SOME EXPERIMENTAL OBSERVATIONS CONCERNING THE BEHAVIOR OF VARIOUS BEES IN THEIR VISITS TO COTTON BLOSSOMS. I

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IN the past a great deal of experimental work has been carried on to determine how flowers attract insects. The conclusions reached have been various and have served to provoke lively discussions as to the relative importance of the visual sense and the olfactory sense in guiding insects to flowers.

Beginning with the notable work of Sprengel, an extensive literature has developed attempting to explain the relative importance of colors and odors in attracting insects to flowers. The conclusions reached have served to provoke lively discussions as to the relative importance of the visual and olfactory sense in guiding insects to flowers. Herman Müller, Delpino, L. Errara, Lubbock, Knuth and others firmly supported the view that flowers advertised their location to passing insects by their conspicuous colored portions and considered odors of only secondary importance. In 1879 Gaston Bonnier advanced the opinion that colored petals were of slight importance in attracting insects to flowers. Later, after much experimenting, Felix Plateau promulgated his extreme views that the colored structures of blossoms were of practically no use as a means of attracting insect visitors, but that odors were the chief means by which bees and other insects were led to find blossoms. Plateau radically expressed himself as follows:

> Dans les rapports entre les insectes fécondateurs et les fleurs entomophiles la coloration plus au moins vive des organes floraux n'a pas le rôle prépondérant que Sprengel, H. Müller et leurs nombreux adeptes lui ont attribué. Toutes les fleurs de la nature pourraient être

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vertes comme les feuilles sans que leur fécondation pas les insectes fut compromise. L'odorat si développé chez la plupart des insectes loin d'être un facteur accesoire est vraisemblement le sens principal qui leur fait découvrir les fleurs renfermant du pollen ou du nectar.[1]

It is pretty generally conceded, however, that the corolla of flowers and many other conspicuous floral structures possess a very important function in serving to attract various insects. Many odors likewise serve the same purpose, even to a very considerable extent, as shown by the interesting experiments of Plateau and others.

In connection with experimental cotton breeding investigations in northern Georgia, the writer has had occasion to give considerable attention to the visits of bees and other insects among cotton blossoms in this region. The large number of certain species of bees regularly visiting cotton blossoms and the ease with which observations could be made in the field led the writer, during the summer of 1910, to make a series of experiments in order to learn more definitely, if possible, just how cotton blossoms attract bees, whether mainly through the visual or the olfactory sense.

These experiments were made at the beginning of the blooming season when blossoms were very scarce and bees very numerous. The first experiment was begun in the forenoon of July 26, and others followed throughout July and early August. Each day the period of observations began at eight or nine o'clock and terminated about twelve or one o'clock, at which time the blossoms were beginning to close and bee visitors were much less frequent. For each test a period of half an hour or an hour was usually allowed, thus making the number of insect visits sufficiently numerous for valid conclusions.

By far the majority of bee visits were made by *Melissodes bimaculata,* although other species of *Melissodes* were no doubt casual visitors. The big wasp (*Elis plumipes* Drury) and a *Bombus* or an *Entechnia* occasionally

[1] "Les Insectes et la Couleur des Fleures," *L'Année Psychologique,* 13, 1907.

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appeared. Later in the season the visits of the extremely common *Melissodes bimaculata* suddenly fell off, and the common honey bee (*Apis mellifica* L.) became more frequent in its visits. For reasons rather difficult to explain, honey bees at the beginning of the experiments were very rare visitors.

The observations and conclusions apply mainly to the behavior of species of *Melissodes*. A count was made of every bee which gave definite evidence that it had perceived the blossoms under observation. These records also included the number of times bees actually alighted upon or entered them. Many bees which do not enter a blossom frequently indicate that they have perceived it by a sudden pause or quick turn toward it momentarily. The manner and thoroughness of these inspections by bees ranges from the merest swerve and hesitation in their flight to a close and scrupulous scrutiny of the blossoms from all sides as they hover over them. At all times it is evident that the actual number of entrances into a blossom is small when compared with the number of inspections without entering. Just why so many bees inspect a normal blossom and refuse to enter is not clear. This is more particularly the rule with species of *Melissodes*.

It is not long till one can readily identify the more important bee visitors within certain limits by their different flight characteristics. Bees of the species *Melissodes bimaculata* appear as black, swift-flying, nervous bees, and are readily determined by their hasty movements among the cotton plants. The species of bumble bees, the common honey bee and *Elis plumipes* are more labored in their flights from blossom to blossom. The wasp, *Elis plumipes,* usually flies very slowly and seems to find it necessary to alight on a blossom in order to inspect it to advantage.

At the beginning of the experiments three blossoms were arranged in such a way as to form a triangle were they connected by straight lines. In some of the

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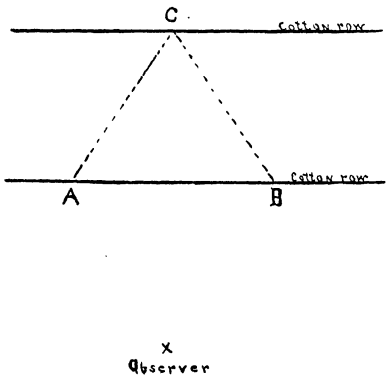
later tests the blossoms were arranged in a line on the same row of cotton. When the triangular arrangement was followed, the points (*a*) and (*b*) were on plants in the same row and about four feet apart. Point (*c*) was situated on the next row back, equally distant from (*a*) and (*b*). The writer was concealed in the cotton directly in front of these points so that each could be kept readily under observation at all times (see Fig. 1). In each test



the only changes made were concerned with the blossoms at the points in question. One blossom at least in each experiment served as a control. See the accompanying triangular diagram.

Experiment No. 1.—July 26. Time of observation, one hour—from 9 to 10 A.M.

At (*a*) a normal blossom was growing *in situ* as a control.

At (*b*) a normal blossom was growing *in situ* as a control.

At (*c*) petals only of a blossom were carelessly pinned to a stem.

An *Elis plumipes* once alighted on the petals of (*c*), but immediately discovered the deception and flew away. The species of *Melissodes* in no instance alighted. These bees, it would seem, possess rather keen discerning powers, since without alighting they quickly detect the difference between a normal and a mutilated flower. In many instances, however, they inspect very carefully

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a suspicious blossom before passing on. From this test it is evident that the petals alone, as used at (*c*), were quite as efficient in inviting inspection as the normal blossoms themselves. The blossom at (*b*) received fewer inspections, probably because it was less readily perceived among the leaves which nearly surrounded it.

The bee visits were distributed as follows:

DATA FOR EXPERIMENT NO. 1

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	81	77	1			3	6	3	1			2
(*b*)	44	44					4	4	0			
(*c*)	82	81	1				0	0	0			

Experiment No. 2.—July 26. Time of observation one half hour, from 10 minutes past 10 to 10:40 A.M. Blossoms in the triangular arrangement as before. See diagram.

At point (*a*) same blossom with petals removed.

At point (*b*) same blossom entire as a control.

At point (*c*) petals alone as in preceding experiment.

DATA FOR EXPERIMENT NO. 2

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution of Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	4	4					0					
(*b*)	50	50					5	5				
(*c*)	62	62					0	0				

The removal of the corolla of (*a*), which in the past experiment received 81 inspections, reduced the number of inspections at once to 4 as compared with 62 inspections of the detached petals at (*c*).

Exactly similar results were obtained by Darwin in

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his experiments with *Lobelia erinus*. He says: "I cut off the petals of some and only the lower striped petals of others and these flowers were not once again sucked by the bees, although some actually crawled over them. The removal of the two little upper petals alone made no difference in their visits."

Experiment No. 3.—July 26. Time of observation one half hour, from 10:40 to 11:10 A.M. Blossoms in the triangular arrangement.

At point (*a*) 3 petals are replaced loosely.

At point (*b*) same blossom entire as before. Control.

At point (*c*) petals alone as in preceding experiments.

DATA FOR EXPERIMENT NO. 3

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	53	51			2		0					
(*b*)	51	50			1		1				1	
(*c*)	67	65			2		0					

With these petals now carelessly affixed to the blossom at (*a*) from which the corolla had been entirely cut away, the number of inspections is at once as frequent as for the control at (*b*). It appears that color and texture more than normal form and arrangement first direct the bees to inspect the blossoms.

Experiment No. 4.—July 26. Time of observations one half hour, from 11:15 to 11:45 A.M. Blossoms in the triangular arrangement with the following change from the preceding experiment.

At (*a*) cloth petals of an artificial rose are carefully arranged and pinned in position to simulate an open cotton blossom. The color of those petals approximated the creamy yellow of a natural cotton blossom; the texture, however, was very different.

At (*b*) control. Same blossom entire as in the preceding experiment.

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DATA FOR EXPERIMENT NO. 4

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	6	6					0					
(*b*)	48	45			1	2	9	7				2
(*c*)	65	62			1	2	0					

At (*c*) control. Petals only as in the preceding experiment.

Bees have been very little attracted by the artificial cloth petals at (*a*). Although the color is not precisely that of a cotton blossom, several bees gave evidence of having perceived them. The texture, which is that of coarse meshed cloth, is quite unlike that of cotton petals, however, and may have been readily perceived as unreal by the bees. The few inspections were without doubt invited by the color of the artificial petals, since no odors could be considered operative unless of a repellent nature.

Experiment No. 5.—July 26. Time of observation one half hour, from 11:45 to 12:15 A.M. Blossoms in the triangular arrangement with the following changes:

At (*a*) five cotton petals (normal number) are carelessly placed over the artificial cloth petals.

At (*b*) control. Same blossom entire as in the preceding experiments.

At (*c*) petals alone as in the preceding experiments.

DATA FOR EXPERIMENT NO. 5

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	48	45				3	1					1
(*b*)	44	43				1	7	7				
(*c*)	50	48	1			1	0					

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It is now evident that all the blossoms serve equally well to invite inspection. It is plainly indicated that the artificial cloth petals could have possessed little or no repellent odor, although they received very few inspections in the experiment just preceding. It is not improbable that the different texture of the material revealed the artificial nature of the cloth petals to the bees.

Experiment No. 6.—July 27. Day cloudy, showery in forenoon, thus greatly interfering with frequency of visits. Blossoms in the triangular arrangement.

At (*a*) control. A normal blossom pinned in position.

At (*b*) control. A normal blossom growing *in situ*.

At (*c*) a single petal pinned to a stem.

Observations were begun at 9:00 A.M., but rain intervened at 9:15. A single inspection was recorded for (*c*).

Observations were again begun at 10:25, lasting for one half hour until 11:05. The blossoms were arranged in the triangle as follows:

At (*a*) control. A normal cotton blossom pinned in position.

At (*b*) control. A normal cotton blossom growing *in situ*.

At (*c*) a half opened bud simulated by pinning normal petals together, the calyx being represented by a portion of a green cotton leaf carefully wrapped around the base. In this way it was absolutely certain that no unaccustomed odors were introduced. This bud-like arrangement prevented all chances of examination of the inner details by bees until they had actually squeezed down between the petals.

DATA FOR EXPERIMENT NO. 6

Points of Triangle	Total Inspection	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Espithnaipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	48						2					
(*b*)	21						0					
(*c*)	47						1					

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A record of the kind of bees was not accurately kept, but species of *Melissodes* were almost the only visitors. The blossom at (*b*) was less visible than those at (*a*) or (*c*), both of which were in plain view of each other. The blossom at (*b*) was not visible either from (*a*) or (*c*), so that many bees which inspected (*a*) and (*c*) frequently failed to perceive (*b*).

Experiment No. 7.—July 27. Period of observations one half hour from 11:08 to 11:38. Blossoms in the previous triangular arrangement changed as follows:

(*a*) Normal blossom used in the preceding experiment concealed by fastening the surrounding leaves in such a manner that the blossom would be visible only by bees passing directly over it.

(*b*) Control. Normal blossom growing in situ.

(*c*) Artificially constructed bud as used in latter half of experiment 6.

The inspections were as follows:

(*a*) Received a single inspection from a bee flying directly over.

(*b*) Received 12 inspections, two of these being entrances.

(*c*) Received 40 inspections, none being entrances.

Experiment 7 differs from experiment 6 in no particular whatever except in the change which has rendered the blossom at (*a*) invisible, except from a certain position. The number of inspections at (*b*) and (*c*) remained practically constant for each half-hour period. It is interesting to note, however, that (*a*), receiving 48 inspections in experiment 6, received but a single inspection in experiment 7. A change in surroundings which makes a blossom less visible to the visual sense of bee visitors at once decreases the number of inspections.

Experiment No. 8.—July 27. Time of observations ten minutes from 11:38 to 11:48 A.M. Blossoms in the triangular arrangement, with no change whatever from the preceding experiment except in making the blossom

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at (*a*) again as visible as in experiment 7 by pushing aside the surrounding leaves.

(*a*) Is inspected 15 times, including one entrance.

(*b*) Is inspected 7 times, including two entrances.

(*c*) Is inspected 13 times with no entrances.

The blossom at (*a*) has now become as attractive to the bees as those at (*b*) and (*c*) which serve as controls.

Experiment No. 9.—July 27. Period of observation 15 minutes, from 10:50 A.M. until 12:05 P.M. Triangular arrangement as in preceding experiments with the following changes:

(*a*) Petals of (*a*) in experiment 8 are removed and artificial crêpe paper petals of nearly the same color are substituted.

(*b*) Artificial blossoms growing *in situ* as a control.

(*c*) Artificial floral structure used at (*c*) in experiments 7 and 8.

(*a*) Receives only two inspections.

(*b*) Receives 16 inspections, including two entrances.

(*c*) Receives 3 inspections, including one entrance.

The artificial nature of the paper petals at (*a*) was at once perceived by the bees in their passing flights. The few inspections noted were indicated by a momentary pause in flight quite unlike the more prolonged hovering movements over the blossom at (*c*).

Experiment No. 10.—July 27. Period of observations 20 minutes, from 12:05 P.M. to 12:25 P.M. The same triangular arrangement was used as before. The only change from experiments 8 or 9 consisted in placing three real cotton petals carelessly upon the paper petals at (*a*) in such a way that only part of the paper petals was concealed. Blossoms (*b*) and (*c*) were left unchanged.

(*a*) Receives 11 inspections.

(*b*) Receives 7 inspections, including one entrance.

(*c*) Receives 21 inspections.

Passing bees were at once led to inspect the real petals placed at (*a*), although these very imperfectly covered the artificial paper petals beneath. No very decided re-

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pellent odors can be held to reside in the artificial paper petals which failed to attract passing bees when used alone.

Experiment No. 11.—July 27. Observations for this experiment continued 10 minutes, from 1:26 to 1:36 P.M. The triangular arrangement was used.

At (*a*) a single real cotton-blossom petal is pinned to a stem.

At (*b*) a cotton bud and calyx simulated by neatly wrapping a portion of a cotton leaf around the base of five real petals rolled together.

At (*c*) a normal open cotton blossom growing in situ as a control.

DATA FOR EXPERIMENT NO. 11

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Elis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	2	2										
(*b*)	8	8										
(*c*)	3	3										

The single petal at (*a*) is sufficient to invite the inspection of passing bees, although there is little more than a fraction remaining of the size and color of a normal open cotton blossom. The writer has observed that a partly opened bud, as represented at (*c*), appears to invite more frequent inspection and entrance than a fully expanded blossom which has been much oftener entered by bees. It is possible that bees in their entrances leave traces of odors which are detected by later visitors, causing them to pass on in search of fresher blossoms.

Experiment No. 12.—July 27. Period of observations one half hour, from 1:36 to 2:06 P.M. In this test, which practically duplicates experiment 11, two blossoms were used in the same row and on plants about three feet apart.

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At (*a*) a single petal was pinned to a stem.

At (*b*) control. A normal cotton blossom *in situ* as grown.

The single petal at (*a*) received 16 inspections, some of which were very thorough, as a number of bees appeared to examine the petal intently from all sides. The control blossom at (*b*) received 26 inspections, including 8 entrances within. In both cases the visiting bees were all species of *Melissodes*.

Experiment No. 13.—July 27. Period of observations one half hour, beginning at 2:06 P.M. and ending at 2:36 P.M. Two blossoms were arranged in the same row as in the preceding experiment.

At (*a*) a perfect cotton blossom was pinned in the same relative position as the blossom at (*b*).

At (*b*) control. A perfect cotton blossom growing *in situ*.

The blossom at (*a*) received 7 inspections, including one entrance. The blossom at (*b*) received 12 inspections, including 5 entrances. Species of *Melissodes* were the only visitors.

Experiment No. 14.—July 28. Time of observations one half hour, from 9:15 to 9:45 A.M. Three blossoms were arranged on three consecutive plants in the same row. Throughout this series of experiments for July 28, these positions were unchanged. See the diagram.

At (*a*) control. A perfect cotton blossom pinned in position.

At (*b*) large blossom of a wild convolvulus (white with a deep purple throat) was pinned in position.

DATA FOR EXPERIMENT NO. 14

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	15	12				3	1					1
(*b*)	14	12				2	0					
(*c*)	14	11				3	0					

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At (*c*) control. A perfect cotton blossom pinned in position.

Although strikingly unlike a cotton blossom in color and general appearance, the convolvulus blossom attracts attention quite as often. It is hardly to be expected that the bees would enter it as frequently as a cotton blossom, if at all, since it is a well-known habit of many bees to confine their visits pretty constantly at any one time to blossoms of the same species of plant. Especially has this been shown true for the honey bee by Hermann Müller and others. M. H. Mendleson, of California, affords an instance where a single colony out of 200 visited solely mustard flowers, while the rest gathered from sage blossoms alone.[2]

Experiment No. 15.—July 28. Time of observation one half hour, from 9:45 to 10:15 A.M. Blossoms arranged in the same row as before with the following changes:

At (*a*) petals removed from the blossoms of preceding experiment.

At (*b*) same white convolvulus blossom used in the preceding experiment.

At (*c*) control. Same cotton blossom of preceding experiment pinned in position.

DATA FOR EXPERIMENT NO. 15

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Eiis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Eiis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	0											
(*b*)	19	17				2	0					
(*c*)	20	20					0					

By the removal of the petals of a cotton blossom as at (*a*), the blossom no longer advertised itself to the attention of bees, as has been demonstrated in previous experiments. In the present test, although the white con-

[2] Mendleson, M. H., "Gleanings in Bee Culture," October, 1908, 36.

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volvulus blossom had completely wilted and collapsed, its noticeable color alone continued to invite inspection by passing bees quite as often as the control blossoms at (*c*).

Experiment No. 16.—July 28. Period of observation one half hour, from 10:15 to 10:45 A.M. The three points in the preceding experiment were used as follows:

At (*a*) a single cotton petal was placed on the blossom of the preceding experiment, from which all the petals had been removed.

At (*b*) a single cotton petal was loosely pinned to a stem.

At (*c*) control. A normal cotton blossom pinned in a conspicuous position.

The blossom at (*a*) receives 8 inspections.

The petal at (*b*) receives 9 inspections.

The normal blossom at (*c*) receives 27 inspections with no entrances. All visitors were *Melissodes,* except a small bee which inspected (*c*).

As the blossom at (*c*) was conspicuous from all sides, the writer judged that this fact accounted for the much greater number of inspections given this blossom, since (*a*) and (*b*) were visible almost wholly from one side only. In the next experiment this question was further tested.

Experiment No. 17.—July 28. Period of observation one half hour, from 10:45 to 11:15 A.M. In this experiment the only changes from the preceding consisted in an interchange of material.

DATA FOR EXPERIMENT NO. 17

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Ellis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	8	8					0					
(*b*)	22	21				1	0					
(*c*)	27	25				2	0					

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At (*a*) single detached petal pinned to leaf stem.

At (*b*) control. Normal cotton blossom pinned in position.

At (*c*) the cotton blossom with its single replaced petal at (*a*) in preceding experiment.

In this experiment the more exposed position (*c*) appears to be of considerable advantage to a blossom located here, even though its normal appearance is greatly changed by mutilation. The general form and appearance of a cotton blossom, as a whole, does not appear to play a very important rôle in initiating the procedure of inspection by passing bees, since a single detached petal receives quite as many inspections as a normal blossom.

Experiment No. 18.—July 29. Observations continued one hour, from 8:20 to 9:20 A.M. In this experiment three blossoms were used, as in previous experiments, and arranged on consecutive plants in the same row. A blossom of an Asiatic cotton (*Hawasaki*) was compared with two ordinary American upland blossoms as controls.

(*a*) control. Normal American upland blossom pinned in position.

(*b*) *Hawasaki* blossom entire pinned in position.

(*c*) control. Normal American upland blossom pinned in position.

DATA FOR EXPERIMENT NO. 18

Points of Triangle	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Ellis phunipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Ellis phunipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	20	19		1			0					
(*b*)	14	12		1		1	0					
(*c*)	29	24		1	1	3	2				1	1

Experiment No. 19.—July 29. Observations continued one half hour, from 9:25 to 9:55 A.M.

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(*a*) Control. Normal American upland blossom pinned in position.

(*b*) Control. Normal American upland blossom pinned in position.

(*c*) *Hawasaki* blossom entire (at *b*) in last experiment.

DATA FOR EXPERIMENT NO. 19

Position of Blossoms	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Eltis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Eltis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	11	8				3	0					
(*b*)	10	7			1	2	1				1	
(*c*)	3	2				1	0					

Experiment No. 20.—July 29. Observations continued one half hour, from 10:50 to 11:20 A.M.. Three blossoms arranged in the same row as for previous experiments.

(*a*) Control. Normal American upland blossom pinned in position.

(*b*) *Hawasaki* blossom entire at (*c*) in experiment 19.

(*c*) Control. Normal American upland blossom pinned in position.

DATA FOR EXPERIMENT NO. 20

Position of Blossom	Total Inspections	Distribution by Species					Total Entrances	Distribution by Species				
		Melissodes sp.	*Eltis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees		*Melissodes* sp.	*Eltis plumipes*	Honey Bees	Bumble Bees	Unidentified Bees
(*a*)	20	8	1	1		10	3		1	1		1
(*b*)	10	8				2	0					
(*c*)	16	6		1	1	8	2	1				1

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