SCIENCE:

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NOTES FROM THE CORNELL INSECTARY.

BY M. V. SLINGERLAND, CORNELL UNIVERSITY, ITHACA, N Y.

II. — Some Observations Upon Plant-Lice

MORE than three-quarters of a century ago Kyber, a German observer, published under a similar title the results of experiments which not only confirmed the earlier observations of Bonnet and De Geer, but which also threw increased light on the generation and development of Aphids. Kyber found, for instance, that by keeping the insects in a warm room a series of agamic generations was produced which extended through four years without the intervention of the sexual forms. However, no record was kept of the number of generations produced during the time. In 1779, thirty-six years before Kyber's experiment, Bonnet had carried *Aphis sambuci* through nineteen generations without commerce with the male insect. From these and similar experiments a law has been educed, which we dare not deny, that "under certain circumstances a female Aphis may, without coupling, continue propagating to infinity, provided that the necessary conditions for the development of young — food and heat — are not wanting."

April 2, 1890, nearly two years and ten months ago, the writer isolated a nymph recently born of a wingless agamic female plant-louse, and since that time the experiment has been continued and is now in progress in the green-house at the Insectary of the Cornell Agricultural Experiment Station. The insect is probably *Myzus achyrantes* Monell, one of the "green-flies" of florists, which is always to be found in considerable numbers upon the varieties of *Achyrantes* grown in the Insectary; at one time it also attacked buckwheat and radishes growing in the green-house.

The experiment has been conducted in the following manner: The first nymph was isolated by placing her on a small plant known to be free from Aphids, and this plant was kept in a cage made by placing the flower-pot in a large saucer partly filled with sand, and then placing over the plant and pot a glass cylinder, which sank for a slight distance into the sand, and was covered with Swiss muslin at the top. The nymph was examined daily, and when she became a mother two or three of her young would be isolated in similar cages. When these daughters of the original mother became mothers themselves, their young would also be isolated, and so on. Not all of the young of each parent were allowed to live, and sometimes, to save cages, a mother would be removed to give place to one of her daughters; usually, however, a mother would not be destroyed until some of her daughters became mothers, for it frequently happened that some of the nymphs first isolated died before becoming mothers. In some cases the mother was left undisturbed, the young being removed and counted every day or two, to see how long she would live, how many nymphs might be born of a single mother, and whether there was any diminution in the reproductive power as generation after generation passed by without the male element again entering into the case. Great care has been taken to insure the isolation of the nymphs; when there was any doubt as to the pedigree of the nymph, she was immediately replaced by one of known pedigree.

Nothing but wingless agamic females have thus far been produced in the cages. Winged forms are sometimes seen, in April especially, on the other *Achyrantes* plants in the Insectary. The following table has been prepared to show the number of the generations, the rapidity with which they have been produced, and many other interesting points which have been brought out during the two years and ten months that the writer has cared for these little creatures — my pets, as I call them.

Generations.	When Nymphs were Isolated.	When Motherhood Began.	Age When Reproduction Began.
1	2 Apr. 1890	14 Apr. 1890	12 days
2	18 " "	30 " "	12 "
3	6, 9 May "	18, 28 May "	12 and 19 "
4	26, 28 " "	6, 11 June "	11 " 14 "
5	25 June, 9 July "	12, 20 July "	17 " 11 "
6	12, 13 " "	26, 31 " "	14 " 18 "
7	29 " "	8 Aug. "	10 "
8	8, 9 Aug. "	18 " "	10 " 11 "
9	20, 21 " "	3, 1 Sept. "	14 " 11 "
10	1, 5 Sept. "	13, 15 " "	12 " 10 "
11	18 " "	17 Oct. "	29 "
12	17, 27 " "	15, 10 Nov. "	29 " 14 "
13	10, 13 Nov. "	11, 8 Dec. "	31 " 25 "
14	8, 11 Dec. "	12, 5 Jan. 1891	35 " 25 "
15	5, 12 Jan. 1891	26, 28 " "	21 " 16 "
16	26 Jan. 2 Feb. "	14, 16 Feb. "	19 " 14 "
17	14 " "	27 Feb., 4 Mar. "	13 " 18 "
18	27 Feb. 4 Mar. "	20, 23 " "	21 " 19 "
19	20, 30 " "	10 Apr. "	21 " 11 "
20	6, 8 Apr. "	16, 20 " "	10 " 12 "
21	16, 21 " "	27 Apr., 5 May "	11 " 14 "
22	27 " "	10 " "	13 "
23	10 May "	26 " "	16 "
24	27 " "	10 June "	14 "
25	10 June "	22 " "	12 "
26	24 " "	10 July "	16 "
27	10 July "	21 " "	11 "
28	21 " "	30 " "	9 "
29	31 July, 14 Aug. "	11, 24 Aug. "	11 " 10 "
30	24 " "	5 Sept. "	12 "
31	5 Sept. "	18 " "	13 "
32	23 " "	5 Oct. "	12 "
33	5 Oct. "	27 " "	12 "
34	27 " "	11 Nov. "	15 "
35	14 Nov. "	30 " "	16 "
36	3 Dec. "	14 Dec. "	11 "
37	22 " "	4 Jan. 1892	13 "
38	4 Jan. 1892	23 " "	19 "
39	23 " "	10 Feb. "	18 "
40	10 Feb. "	24 " "	14 "
41	24 " "	10 Mar. "	15 "
42	10 Mar. "	25 " "	15 "
43	25 " "	5 Apr. "	11 "
44	5, 12 Apr. "	20, 25 " "	15 " 13 "
45	20 " "	5 May "	15 "
46	5 May "	13 " "	8 "
47	13, 16 " "	25 " "	12 " 9 "
48	25 " "	4, 7 June "	10 " 13 "
49	5 June "	22 " "	17 "
50	22 " "	4 July "	12 "
51	4 July "	13 " "	9 "
52	13 " "	22 " "	9 "
53	18 Aug. "	1 Sept. "	14 "
54	1, 6 Sept. "	13 " "	12 " 7 "
55	16 " "	26 " "	10 "
56	26 " "	7 Oct. "	11 "
57	7 Oct. "	22 " "	15 "
58	22 " "	7 Nov. "	16 "
59	7 Nov. "	21 " "	14 "
60	21 " "	6 Dec. "	15 "
61	9 Dec. "	27 " "	18 "
62	27 " "	17 Jan. 1893	21 "

Let me point out a few of the most interesting facts to be gleaned from an examination of the above table. Sixty-two generations have been produced thus far, or nearly two (1.8) generations a month on an average. The extremes were in the 13th and 14th generations, when it took a month for a generation to develop; and in the 46th, 47th, and 48th generations, which were all produced within a month.

This difference was due to the fact that the plants had become old, stunted, and pot-bound when the 13th and 14th generations of the Aphids were produced, while in the other case the plants were young and vigorous. It was also found that this difference in the plants produced not only the retardation of development of the Aphids, but there was also a very marked difference in their size and reproductive power. On these stunted plants it takes from two to three times as long for the nymph to develop, it does not attain more than one-third the size, and less than one-third