mens, before the Entomological society of Washington. The size of the genital orifice in mounted specimens under cover-glass is 1 mm. in diameter.

Measurements of the antennal segments of the three full grown females, the length of which were 5½ mm. 5 broad and 4 high. The measurements in the tables are in micromillimeters.

Segments.	1	2	3	4	5	6	7	8	9	10	11
	136	120	16	56	52	64	64	80	80	80	180
	136	120	16	68	52	68	76	76	80	80	180
	130	120	136	60	52	68	76	80	80	80	160
	120	120	136	64	48	64	76	80	80	80	180
	120	120	136	52	40	72	56	80	80	72	168
	120	120	120	60	48	64	64	68	76	68	168

Measurements of the antennal segments of the younger forms. ♀ 4 mm. long, 3 broad, 2½ high, 10 and 11 segmented.

Segments.	1	2	3	4	5	6	7	8	9	10	11
	120	108	120	60	60	64	72	80	80	80	160
	120	100	104	56	48	60	60	72	88	72	160
	120	112	112	52	48	68	60	56	56	64	160
	80	100	120	48	40	80	52	60	56	136	
	80	84	120	72	40	44	40	40	56	140	

Measurements of the segments of the newly hatched larvae.

Segments.	1	2	3	4	5	6
	52	56	60	44	44	140
	52	60	60	48	44	132
	53	60	60	48	40	132
	53	60	60	48	40	132

[*George B. King.*]

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—XX.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Heliomata cycladata Grt.

Egg. Laid singly on the edge of a leaf or in a hole or on end on the petiole. Flattened cylindrical, rounded, one diameter distinctly shorter, ends flattened, the basal one the most so, but rounded. Eight ribs projecting at the rim of the micropylar area increasing to a few more by interpolation at about two-thirds the distance toward the other end; raised, coarsely beaded with nearly contiguous clear granules, a little waved and also slightly flexuous in course, joined by thick, curved cross-striae, a little irregular and not always quite parallel, one to each bead. At the base the sculpture becomes confused into rounded pit-like reticulations of which confusion the short interpolated ribs seem a part. Coarse lumpy

reticulations also in the small level micropylar area. Dark leaf green, the beading a shade paler, not white. Size .6 × .35 × .25 mm.

Stage I. Head round, higher than wide, scarcely bilobed, erect, free from but lower than joint 2; sordid luteous, grayish on the vertex, ocelli black, mouth brown; width about .2 mm. Body stout and rather thick, normal, smooth, incisures distinct, the segments a little bulging ventrally. Sordid translucent white, pale green from the food; very faint brownish subdorsal mottlings the whole length. Tubercles small, black in white rings. Shields concolorous, uncornified, cervical shield faintly luteous, the rim of joint 2 before whitish. Setae small, obscure.

Stage II. Head rounded, slightly bilobed, erect, slightly lower than joint 2; pale luteous, slightly shining; width .35 mm. Body short and thick, normal, incisures distinct; translucent, pale green from the food, tubercles greenish dusky, rather distinct, pale edged. Faintly indicated dusky longitudinal lines, narrow subdorsal and broad lateral, but very obscure. Thoracic feet blackish; setae short, black, distinct. Abdominal feet and obsolete shields concolorous with body.

Stage III. Head broad, bilobed, rounded, flattened before, erect; pale yellowish, not shining, ocelli black; width .6 mm. Body short and thick, smooth, uniform pale green, translucent, not shining, incisures folded and whitish. Feet concolorous; no shields; no marks. Tubercles minute, blackish; setae short, dusky.

Stage IV. Head round, circular from before, lobes full, slightly bilobed, erect, free; light green, ocelli small, black, antennae moderate, whitish; width 1.15 mm. Body short and thick, the central segments only a little longer than the end ones and shaped about as in Noctuid larvae, the ends being slightly contracted. Feet normal, the thoracic ones moderate, the abdominal on joints 10 and 13, the latter with large triangular plate; anal plate rounded; cervical shield divided into two well separated ellipses. Tubercles distinct, rather large, not elevated, concolorous; setae short, black. Entirely light green without marks, the plates and tubercles slightly shining, the skin dull. No anal prongs. Tubercles normal, ia to iib equally spaced on joints 3 and 4 and separate. Spiracles narrowly dark rimmed.

Stage V. Head round, circular, flat before and a trace flattened on the apex; clypeus two thirds to vertex, the paraclypeal pieces very narrow and obscure; finely shagreened; width 1.9 mm. Body robust, the segments not elongated, the end ones proportionately a little contracted, obscurely 6-annulate. Feet normal, short, the anal pair triangular and slightly produced at the upper angle; anal plate elongated, rounded. Tubercles very small, not elevated, distinct; setae short, pointed; both black. The coloration varies from green to more or less heavily spotted. In the former the head is luteous green, subtranslucent, ocelli dark. Body green like the leaf, the folded incisures yellowish, faint dotted whitish subdorsal and lateral lines; subventral fold yellowish; spiracles brown rimmed; dorsal vessel darker green. In the spotted form the head is green mottled broadly with brown spots over the vertex. Body green with many fine brown specks forming triangular brown spots subdorsally on joints 5 to 8, pointed before and in general segregated into geminate parallel lines. The lines are subdorsal, lateral and subventral, enclosing paler spaces, but very obscurely. Also a faint dorsal line. The dottings are somewhat mottled, heaviest centrally on the segments, contracted, and therefore darker, on joints 10 to 13, the anal plates spotted. Venter rather broadly green, paler lined. Feet brownish dotted.

The larvae spun very slight webs of brownish silk in the ground at the surface and

turned to thick stout pupae. Abdomen small tapering. Dark brown, the cases a little greenish. Body coarsely punctured, cases shagreened as if irregularly eroded; abdominal segments ridged in front. Cremaster a long spine, widened at base and with two recurved hooks at tip.

Food plant probably locust (*Robinia pseudacacia*); at least the larvae fed readily on this plant and the moths were taken flying among the trees. Eggs June 10th, mature larvae July 10th. Single brooded, the fall and winter being passed as pupa. Larvae from Washington, D. C.

THE KATYDID'S CALL IN RELATION TO TEMPERATURE.

The following observations on the frequency with which the call of the Katydid (*Cyrtophyllus perspicillatus*) is repeated and their relation to the temperature at the time were made in Milton, Mass., by Mr. Roland Hayward, between August 26th and October 7, and are here printed from his memoranda. The first column gives the date, the second the temperature in degrees of the Fahrenheit scale, the third the number of calls "katydid" or "she did" per minute. In all cases they were counted for at least one minute.

Aug. 26	82°	89
27	78°	76
28	67°	45
29	69°	46
30	72°	60
31	70°	47
Sept. 1	66°	39
2	73°	58
3	74°	62
4	73°	60
8	68°	37
9	68°	43
10	63°	20
11	73°	60
12 (windy)	68°	38
13	60°	19
14	68°	35
21	67°	39
22	63°	26
24	65°	35
25	58°	21
26	58°	20
27	64°	32
29	60°	18
30	63°	24
Oct. 1	58°	15
4	64°	32
5 (7 P. M.)	72°	58
(8.30 P. M.)	70°	47
(10.15 P. M.)	68°	39
7	63°	30

PROCEEDINGS OF THE CLUB.

11 January, 1901. The 217th regular and 24th annual meeting (since incorporation) was held at 156 Brattle St., Mr. A. P. Morse in the chair.

The annual reports of the officers were read. The following officers were elected for 1901: secretary, Roland Hayward; treasurer, Roland Hayward; librarian, Samuel H. Scudder; members at large of executive committee, A. P. Morse, S. H. Scudder.

The annual address of the retiring president, J. W. Folsom, was read, entitled: The distribution of holarctic Collembola,—published in full in PSYCHE.