WINTER INSECT LIGHT-TRAPPING AT THE ARCHBOLD BIOLOGICAL STATION, FLORIDA[1]

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The Archbold Biological Station, located about ten miles south of Lake Placid, Florida, was selected to study insects attracted to light traps in a semitropical area. This station, affiliated with the American Museum of Natural History, is situated in a typical slash pine, sandy area latitude 27° 10′ 30″ North and longitude 81° 21′ East. The laboratory provided ideal facilities for insect light-trap studies. The project covered a period of two winters, 1958-1959 and 1959-1960, from early November to April first in each case. The studies during the first winter were somewhat preliminary and the traps were not run every night. The second winter the traps were operated practically every night. Three objectives were considered: the feasibility of operating insect-light traps during the winter months, the species involved, and the periods of the night when different species or groups of species were active. Since no extensive light trapping has been done previously in such an area, the opportunities were unlimited and the results have been more satisfactory than expected.

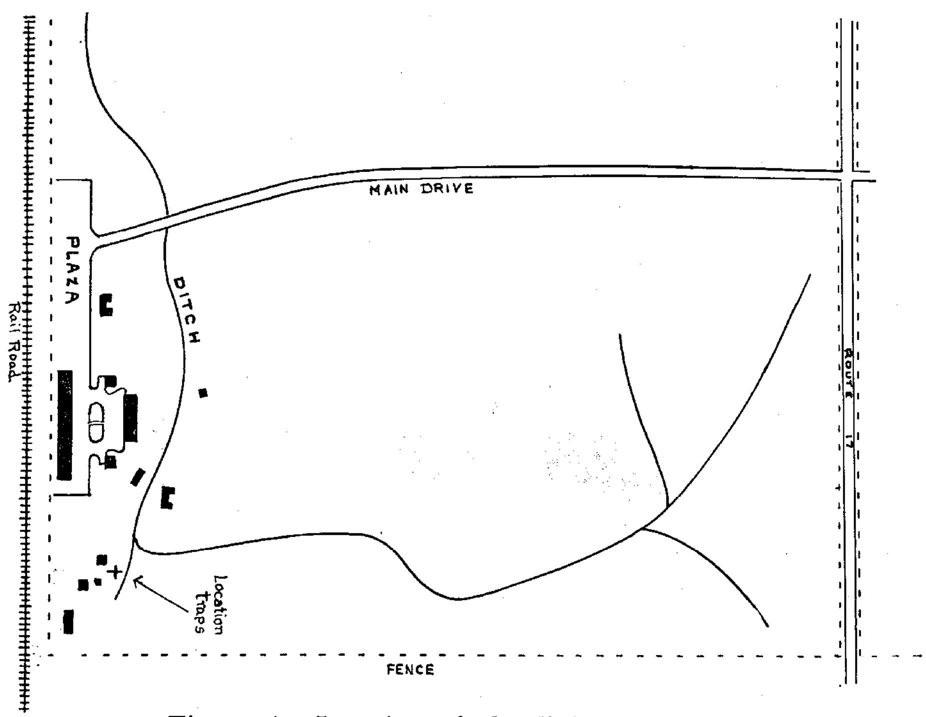

Figure 1. Location of the light traps at the Archbold Biological Station.

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The Light Trap

The same type trap was used throughout the studies. It was constructed entirely of 20 guage sheet aluminum and provided with a central, vertical, black-light fluorescent lamp. Four baffles 20 inches long and 5½ inches wide were placed at right angles to the lamp. A 25 inch circular top diverated the rain. A 60 degree funnel, 12 inches in diameter directed the insects downward. This was narrowed to a 2 inch opening at the bottom which was fitted with a threaded mason jar top to accommodate pint sodium cyanide killing jars. Small containers were desirable to facilitate complete removal of all insects and to permit proper cleaning. It was essential that these jars be similarly prepared as this determined their uniformity in killing the insects attracted. Ten jars were usually prepared at a time. The high humidity of Florida necessitated the preparation of new jars at about three months intervals. A few narrow strips of paper toweling were placed in each jar, when in use, to absorb excessive moisture and to prevent the larger insects from injuring the smaller ones. After use, the jars were thoroughly cleaned and filled with paper toweling to keep them dry.

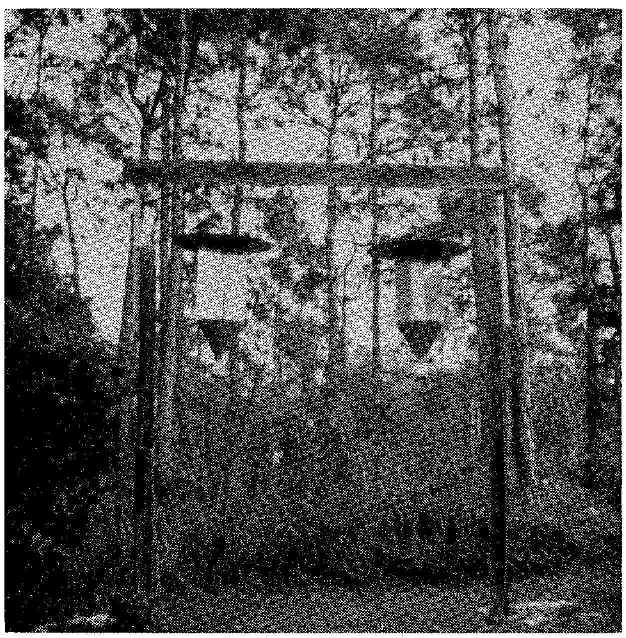

Figure 2. Two light traps on standard, somewhat dense foliage in the background, open exposure in the foreground.

Location: During both winters the light traps were located in the same small clearing at the southwest corner of the Station grounds. They were hung on a standard eight feet above the ground and were completely exposed on two sides but somewhat shielded on the other two by trees and bushes. Nearby were two guest houses, a chicken yard, a vegetable garden and a wash house, all of which had some bearing on the operation of the traps. This location was selected partly to be near the living quarters so that hourly visitations could be made readily. The wash house supplied electric power for the timers and relays and a comfortable place to remove the insects from the cyanide jars during all types of weather. The garden, chicken yard and surrounding foliage accounted for some of the insects trapped.

OPERATION: With a few exceptions, the traps were operated every night. They were turned on by means of a time clock at 6 P.M. and off at 7 A.M. the following morning, regardless of light intensity. The nocturnal flight of most insects was thus included. The manipulation of the light traps was divided into six periods. From 6 to 10 P.M., the traps were visited hourly; the insects were removed from the killing jars and transferred to properly labelled pint icecream boxes. Fresh jars were then placed on the traps. Hourly collections were necessary during warm evenings when the insects nearly filled the cyanide jars. Such collections supplied information on the time of flight of certain insects and yielded much better specimens. The balance of the night and early morning was divided into two periods, 10 P.M. to 2 A.M. and 2 A.M. to 7 A.M. This was accomplished by operating two traps within three feet of each other. Cyanide jars were placed on both traps at 10 P.M. The lamp of only one trap was illuminated at this time. At 2 A.M. the lamp of this trap was switched off and the other on, by means of an electric relay and a time control. It should be noted that small numbers of insects were caught in the unilluminated trap. This was probably due to the fact that insects attracted to the illuminated trap were intercepted by the baffles of the unilluminated trap. Also, the light from the illuminated trap reflected upon the baffles of the adjacent trap thus forming a slight attraction for insects. The following tests indicate that the number of insects captured in the unilluminated traps, under such conditions, was not large.

TABLE 1.—INSECTS CAPTURED IN ILLUMINATED AND UNILLUMINATED TRAPS PLACED WITHIN THREE FEET OF EACH OTHER.

Period	Illuminated traps		Unilluminated traps
Nov. 4	Pyralidae	42	9
6-7 P.M.	Staphylinidae	404	92
	Misc. Coleoptera	191	7
	Other insects	2890	145
	Total insects	3527	253
Nov. 25	Pyralidae	692	109
10-12 P.M.	Staphylinidae	488	233
	Misc. Coleoptera	764	69
	Other insects	2496	270
	Total insects	4440	681

Sorting the Collection

The morning following the night's operation, except in a few cases when the collection was exceedingly large, the material was completely sorted. This involved the identification and counting of the common species and the search for and preparation of the rarer species, for subsequent identification. This procedure required considerable time and patience.

Various sorts of simple equipment aided in the sorting process. White pans 10 × 12 inches and 2 inches deep were very useful to spread the material for a general inspection and to remove moths, grasshoppers, crickets and other large insects. After these and many of the medium-sized insects were removed, the sample was usually transferred to a six-inch petri dish for the separation of the smaller insects. Only a small portion of the sample was taken at a time until the whole was completed. This material was examined under a binocular microscope to assure the recovery of small species such as Psocidae, Aphidae, and even Strepsiptera. The scales of the Lepidoptera often obscured the smaller insects and hindered their separation. They were removed in two ways. Gently blowing over the container usually left the sample clear for examination. When static electricity caused the scale to adhere to the bottom of the petri dish, pouring the material several times from one dish to another, removed scales and other minute debris.

If the sample did not exceed 5000 specimens, the whole was sorted and every insect accounted for. If larger, other methods were necessary. After the removal of the larger and medium sized insects an "insect sorter" was very useful. This machine, made in the laboratory workshop, consisted of a cylinder of copper screen, 14 meshes to the inch, 8½ inches long, and 8 inches in diameter. It was arranged so that it could be tilted and revolved. Various insects were readily separated by this device. Specimens of the minute mayfly *Caenis diminuta* Wlk., which were usually a problem because of their small size, their abundance, and the fact that they adhered to each other in great masses, were retained by the screen, allowing smaller insects especially Staphylinidae and Trichopterygidae, to pass through. These were collected in a white pan placed below the separator. Screens of larger meshes, 8 and 4 meshes to the inch, were sometimes useful in separating larger insects.

A very large collection required division. Collections were never divided until all the larger insects and most of the medium-sized insects had been removed, resulting in a somewhat uniform mixture. This often consisted of one or two dominant species. The Corixidae for example often constituted a large percentage of such a mixture. The sample was thoroughly mixed and a portion taken by weight for careful examination and counting. Rare insects might be missed by this method, but if suspected, the unexamined portion was preserved for future study.

Very small insects such as the midges and Staphylinidae were difficult to pick up with forceps. They were most easily counted by pushing them aside, selecting one species at a time.

Small petri dishes, approximately 30 mm. in diameter, were very handy to hold desired specimens until time permitted proper mounting. These dishes could be closed to retain a certain amount of the original moisture and to protect the insects.

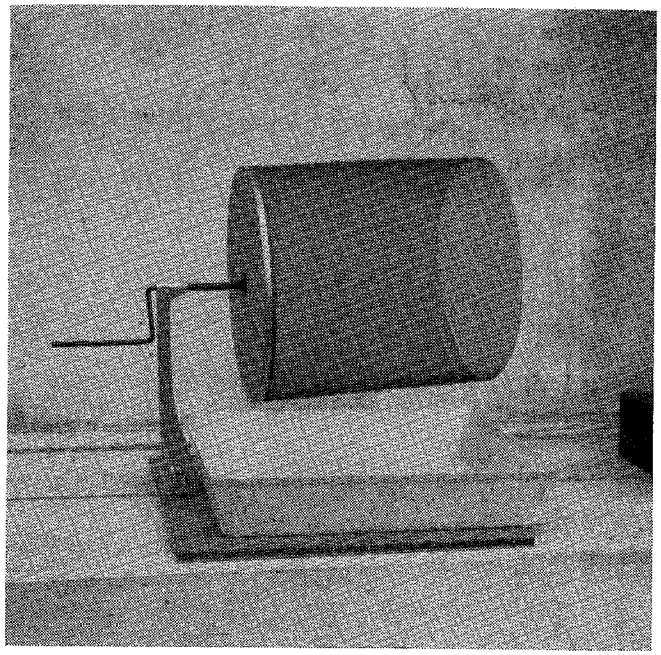

Figure 3. An insect sorter.

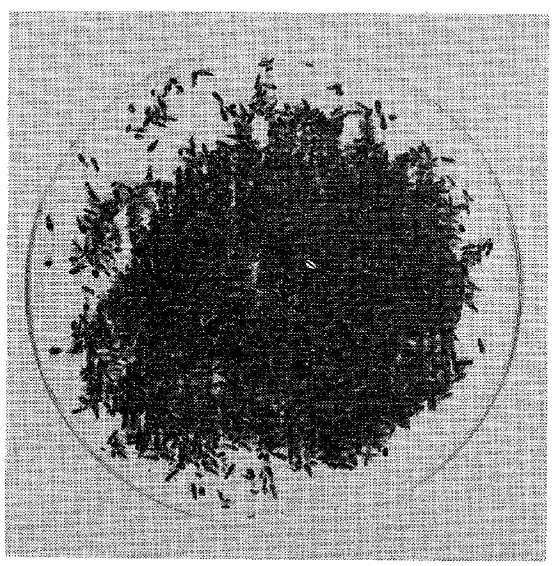

Figure 4. A uniform mixture of insects in a six-inch petri dish after the removal of the larger insects. Micro Coleoptera predominate.

Recording the Data

A two-page form was prepared to include the orders, families, genera, and species to be recorded with spaces for the intervals of collections. It was difficult to arrange a suitable form that would be concise and flexible. Ten orders, 40 families, 18 genera, and 10 species were included. The common species such as *Etiella zinckenella* Treit., *Tomaspis bicincta* Say and *Diplotaxis bidentata* Lec., were indicated by generic names only. On the other hand, rarer species such as *Trox terrestris* Say, *T. monachus* Hbst., and *T. suberosus* Fab., were recorded collectively under the generic name *Trox* to be classified subsequently.

Over 95 per cent of the material has been identified with only a few small groups remaining to be studied. The majority of the material has been deposited in the collection of The Pennsylvania State University but representatives of the more common species have been placed in the Archbold Biological Station collection. New and rare species have been retained by those making identifications.

Factors Affecting Light Trap Operations

There are two major sources of variation in evaluating light trap catches: the activities of the insects and the environmental conditions. The activities of the insects are due primarily to seasonable abundance, differences in the response of males and females, and types of flight. The latter determines to some extent the number of insects actually caught. Certain beetles, especially the aquatic species, dash into the baffles and drop almost immediately into the funnel and thence into the killing jar. Moths and other insects tend to circle about the light, and often fly away to rest on some nearby surface or even fail to enter the trap until the following night.

Odors produced by the scent glands of males or females may attract others of the same species thus increasing the number caught. Copulating pairs of Formicidae, Tipulidae and Cecidomyiidae have frequently been taken in light traps. These, however, were probably mated before they were attracted to the traps. Many insects were undoubtedly on nuptial flights when they were captured.

Environmental factors include geographical location, the local placement of the traps and the weather conditions including precipitation, humidity, wind direction, wind velocity, temperature, light intensity, especially at sunset and at dawn, and possibly the effect of moonlight. The location of the traps was standardized but the ever changing weather conditions presented a problem difficult to evaluate.

These studies were concerned chiefly with the species and number of specimens captured, however, some notes were taken on temperatures. During 1958-1959, temperatures were taken at 6 P.M., 7 A.M., and the lowest for the night, which were averaged to give the mean temperature for the period of operation of the traps. During 1959-1960, temperatures were taken at hourly periods from 6 to 10 P.M., at 7 A.M., and the lowest for the night, which were averaged. Daily temperatures from 7 A.M. to 6 P.M., were plotted but rarely reflected any influence on the nightly collections.

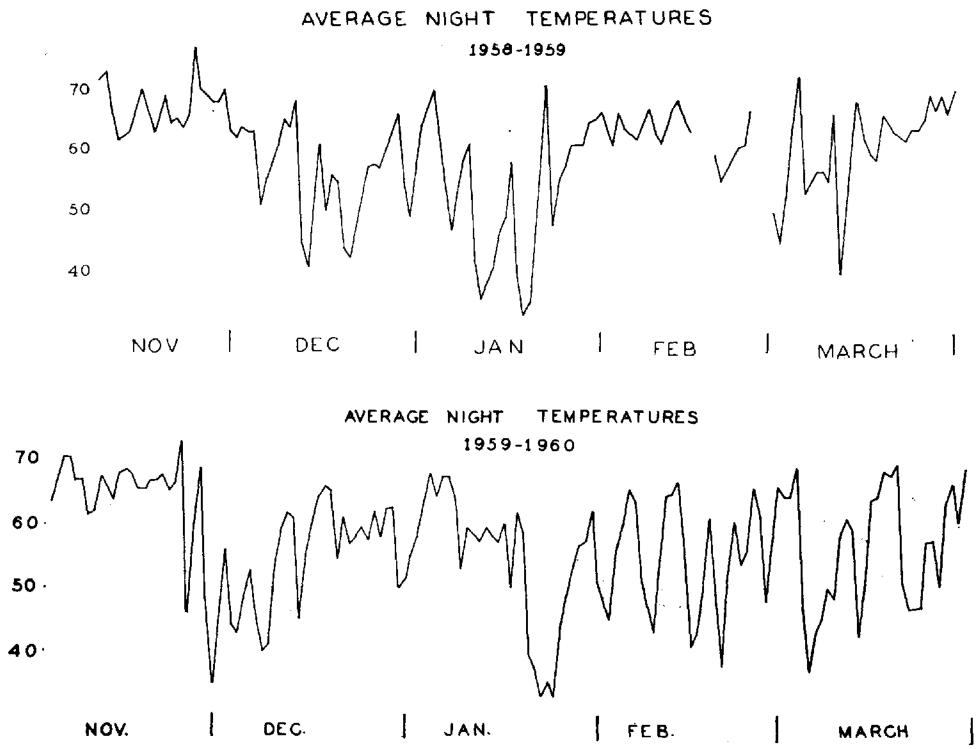

Figure 5. Average night temperatures November-March 1958-1959 and 1959-1960.

Generally, temperatures during the period of operation of the traps, from 6 P.M. to 7 A.M. were the most important factors regulating the abundance of the insects caught. The total number of insects taken during 1959-1960, the number of *Caenis diminuta* Wlk., the number of *Trichocorixa louisianae* Jacq., and in fact all the species or groups were considerably reduced during the cool periods from November 28 to December 1, January 20 to 25, and March 4 to 9. Figure 5 indicates that low temperatures occurred during these periods.

To further illustrate the temperatures at which insects were attracted in largest number, the month of January, 1960 (Table 3), was selected as it exhibited a wide range of temperatures, many below 40° Fahrenheit and a few above 60°. The average of nightly temperatures for this month was slightly below that of November and March (Table 2). Some details will help interpret this table. It is very evident that temperature is the principle factor concerned. Practically no rain occurred during January (Fig. 6). There was less than one-half inch on the 30th of the month. The night wind velocities were generally low as follows; January 3rd less than 10 miles per hour, January 7th approximately 20 miles per hour until 10 P.M., January 18, 29, 30 and 31 less than 10 miles per hour. All other nights the wind velocities were imperceptible.

The catches were very high when the temperatures were above 60°F., somewhat high when the temperatures were between 50° and 60°, more or less reduced between 40° and 50° and considerable reduced below 40°. The data for the period January 20 to 24th illustrated the effect of low temperatures. This held true for all groups as well as individual species. On the 25th the temperature was relatively high (44.3°) but the catches were low, which illustrates a delay of the insects to return to their normal activity after a prolonged cool period.

Of the 1,085 Orthoptera, listed in Table 3, 1,077 were *Nemobius carolinus* Scudd. A few *Neoconocephalus triops* (L.) and other Orthoptera were included in the total.

TABLE 2.—AVERAGE NIGHT TEMPERATURES *

	Number of days					
Month	Below 40°	40–50°	50–60°	60–70°	Above 70°	Total days
(1958-1959)						
November	0	0	0	18	6	24
December	0	5	12	14	0	31
January	4	7	8	11	1	31
February	0	0	4	22	2	28
March	1	4	8	17	1	31
Total days	5	16	32	82	10	145
(1959-1960)						
November	0	2	0	21	3	26
December	1	7	13	10	0	31
January	5	2	15	9	0	31
February	2	7	9	11	0	29
March	1	8	8	14	0	31
Total days	9	26	45	65	3	148

* Temperatures, in Fahrenheit, were computed for 1958-1959 on temperatures at 6 P.M., 7 A.M., and the lowest for the night. For 1959-1960, they were computed on the temperatures at 6, 7, 8, 9, and 10 P.M., 7 A. M., and the minimum for the night.

The 46,853 Coleoptera involved many species. More than twelve species of Staphylinidae contributed 13,408 specimens, several species of Dytiscidae were included in the 6,969 specimens, and several species of Carabidae contributed 2,122 specimens. *Dyscinetus morator* Fab., was somewhat abundant with 353 specimens.

Of the 8,492 specimens of Lepidoptera, 5,503 were Pyralidae, chiefly *Paraponyx allionealis* (Wlk.) and *Pachyzancla phaeopteralis* (Gn.), and 242 were Noctuidae. Some of the species were not numerous. Only 154 specimens of *Urodus parvulus* (HyEdw.), 39 specimens of *Tolype minta* Dyar and 8 specimens of *Halisidota longa* (Grt.) were taken.

The Heteroptera totaled 4,670 specimens. Approximately 50 per cent (2603) were *Trichocorixa louisianae* Jacq. The balance consisted of numerous species, none especially numerous except the minute *Antillocoris pallidus* (Uhler).

About 50 species of Homoptera were identified but none occurred in noticeable numbers. The Fulgoroidea and Cicadellidae contributed the majority of the specimens.

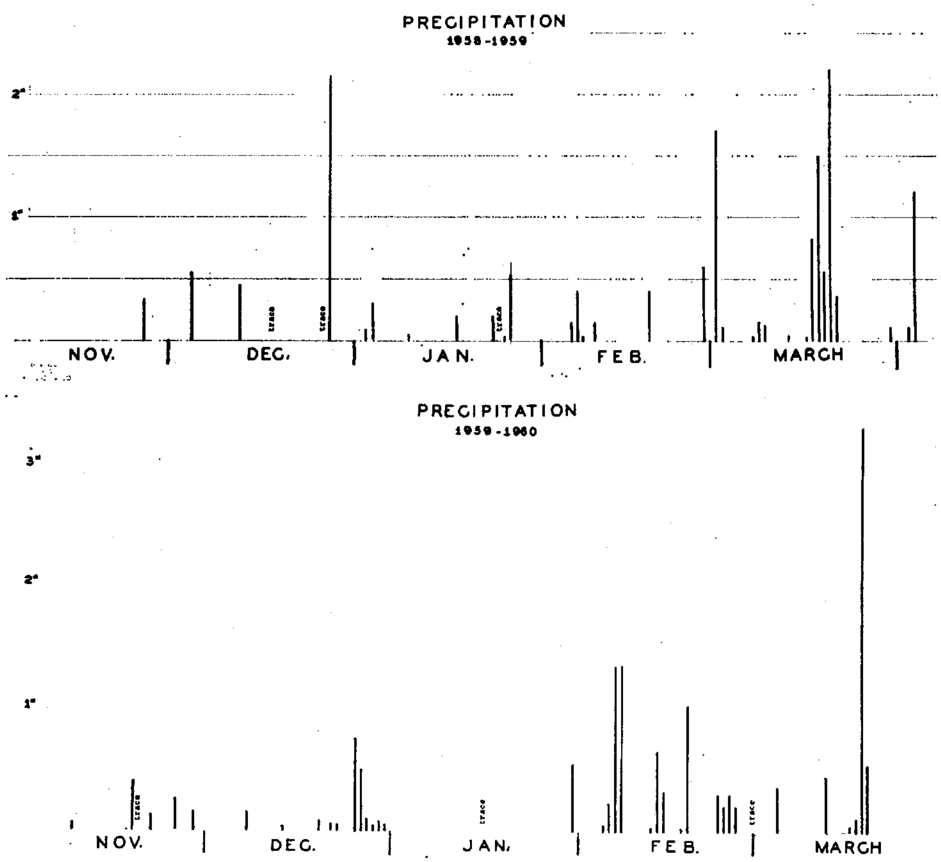

Figure 6. Precipitation November-March 1958-1959 and 1959-1960.

It is evident that the midges constituted the largest part of the Diptera. These consisted of 15,024 specimens of *Culicoides,* 41,986 specimens of Cecidomyiidae and Mycetophylidae, 491 specimens of Tendipedidae, chiefly *Tendipes crassicaudatus* (Mall.), and a few miscellaneous species.

The remaining Diptera, 2,898 specimens, involved relatively small numbers of a large number of species.

The Trichoptera consisted of two groups: two or three species of Microtrichoptera (Hydroptilidae) and approximately ten species of Macrotrichoptera. To date, they have not been identified and were difficult to separate at the time the counts were made.

The Ephemeroptera presented a very interesting picture. *Caenis diminuta* Wlk. contributed 24,210 specimens while only 88 specimens of *Callibaetis pretiosus* Banks were taken.

Eleven species of Psocoptera have been identified but none were noticeably abundant during January.

TABLE 3.—RELATION OF LIGHT-TRAP CATCHES TO TEMPERATURE, JANUARY, 1960.

Date	Orthop.	Coleop.	Lepidop.	Heterop.	Homop.	Midges	Dipt.	Trichop.	Ephem.	Psocop.	Hymenop.	Total	Avg. night temperature
1	1	6	78	5	0	569	12	53	230	1	0	955	53.1
2	5	91	134	20	9	789	20	120	480	2	0	1670	58.2
3	9	543	141	90	15	1355	58	174	3699	23	2	6109	65.1
4	779	13,839	2320	1214	279	6790	414	315	1805	35	20	27,810	68.0
5	150	4975	1381	835	295	5402	197	1188	4778	6	151	19,358	64.7
6	10	911	255	143	66	3134	99	135	3581	29	11	8374	67.6
7	69	13,489	437	1137	93	5836	510	247	444	10	23	22,295	67.5
8	15	795	682	37	18	2853	230	58	75	7	25	4795	64.0
9	0	12	26	1	0	145	3	17	41	0	0	245	53.1
10	3	79	168	7	3	844	32	208	76	2	0	1422	59.7
11	2	335	118	21	0	604	19	304	394	0	0	1797	58.7
12	0	93	95	5	2	356	13	91	155	1	2	813	57.7
13	0	550	133	128	21	584	21	288	409	3	0	2137	59.5
14	1	2119	211	94	24	633	68	392	265	0	3	3810	58.0
15	1	1090	144	83	4	582	83	273	699	0	0	2959	57.5
16	0	1925	284	61	46	3559	246	348	648	9	2	7128	60.2

TABLE 3.—Continued.

Date	Orthop.	Coleop.	Lepidop.	Heterop.	Homop.	Midges	Dipt.	Trichop.	Ephem.	Psocop.	Hymenop.	Total	Avg. night temperature
17	0	37	27	3	1	246	6	67	107	0	1	495	50.2
18	1	884	453	49	23	1997	327	591	365	3	1	4694	62.0
19	20	1624	164	162	58	2796	115	123	844	9	1	5916	59.1
20	0	1	3	0	0	15	2	0	0	0	0	21	39.8
21	0	2	1	0	0	15	1	0	0	0	0	19	37.8
22	0	0	0	0	0	0	1	0	0	0	0	1	33.0
23	0	0	0	0	0	2	0	0	0	0	0	2	35.4
24	0	1	0	0	0	3	0	0	0	0	0	4	33.2
25	0	0	0	0	0	2	0	0	0	0	0	2	44.3
26	0	4	60	4	0	815	5	3	42	0	1	934	48.6
27	0	17	51	7	3	966	10	30	216	1	1	1302	53.5
28	1	283	193	85	15	1840	45	48	1760	2	0	4272	57.2
29	3	2108	583	374	16	2145	126	557	2778	2	2	8694	57.6
30	15	1030	279	93	22	9540	204	77	402	1	6	11,669	62.0
31	0	10	71	12	0	3119	31	4	5	1	0	3253	51.6
Total	1085	46,853	8492	4670	1013	57,536	2898	5711	24,298	147	252	152,955	

The Hymenoptera consisted chiefly of small parasitic species, some Formicidae, and a few Ichneumonidae. The largest collection, January 5th, consisted chiefly of a common species of ant, *Wasmannia auropunctata* (Rog.), indicating a small flight.

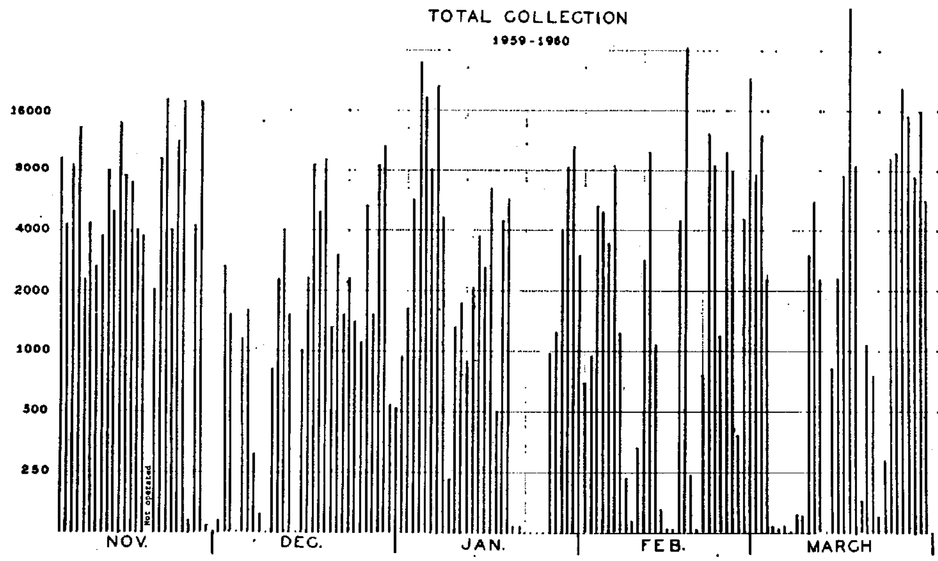

Figure 7. Total insect collections made by light traps November-March 1959-1960.

Table 4 clearly reveals the effect of various temperatures on the number of insects captured in light traps. Ninety-five per cent of the Orthoptera consisted of *Nemobius carolinus*. The balance were *Neoconocephalus triops* and a few miscellaneous species. A large proportion of the Nematocera were *Culicoides*. The Ephemeroptera were chiefly the minute *Caenis diminuta*. The Hymenoptera were almost entirely several species of Formicidae.

The Coleoptera, Lepidoptera, Trichoptera, Heteroptera and Ephemeroptera usually were not affected until the temperatures dropped to 50°. The Orthoptera, Homoptera, Psocoptera, and Hymenoptera were almost absent when the temperatures dropped below 40°. The Nematocera were the last to be affected and often came when the temperatures were well below 40°.

Wind velocities were recorded for the night as mild, 5 miles per hour or less, strong, 5 to 10 miles per hour, or very strong, more than 20 miles per hour. Air currents were generally negligible because the traps were somewhat protected by foliage on two sides. The records indicated that the conditions were calm or with very mild winds on the majority of the nights. During 1959-1960 strong winds were recorded on only seven nights, namely November 16, December 24, January 7, February 4, 11, 13, and March 3. On December 24 and February 13 the winds were very strong and continuous.

Precipitation was recorded for the 24 hour period with special notes for excessive rains during the night. The rains often came during the day especially the late afternoon, and seldom in sufficient amounts at nights to interfere with the operation of the traps. Although rains occurred on

32 twenty-four hour periods, during 1958-1959, they exceeded one inch on only five of these periods. During 1959-1960, rains occurred on 36 twenty-four hour periods, exceeding one inch on only three.

TABLE 4.—RELATION OF THE NUMBER OF INSECTS CAPTURED IN LIGHT TRAPS TO TEMPERATURES*

	Archbold Biological Station, Florida November 4, 1959, to March 30, 1960				
Temperature	Below 40°	40–50°	50–60°	60–70°	Above 70°
No. nights	9	26	45	65	3
Orthoptera	0	0	51	2213	437
Coleoptera	0	72	28,358	143,634	16,112
Lepidoptera	6	354	5973	23,039	3278
Heteroptera	0	12	1847	34,786	2845
Homoptera	0	0	262	4592	1090
Nematocera	38	5994	77,094	125,527	7867
Other Diptera	4	37	1303	4262	827
Trichoptera	2	102	5810	25,338	2422
Ephemeroptera	1	1392	37,653	125,642	53,556
Psocoptera	0	1	176	588	11
Hymenoptera	0	4	76	2290	286

* Average temperatures for the nightly period of operation of the light traps.

TABLE 5.—LIGHT INTENSITY IN FOOT-CANDLES AT SUNSET AT THE ARCHBOLD BIOLOGICAL STATION, 1960*

	Hour					
Date	6.00	6.10	6.20	6.30	6.40	6.50
Jan. 18	10.0					
Feb. 2	29.6	9.6	1.6	.0	.0	.0
Feb. 8	36.8	18.8	4.8	.4	.0	.0
Feb. 16	36.0	32.0	7.6	1.6	.0	.0
Feb. 25	40+	40+	12.2	2.8	.0	.0
Feb. 29	40+	40+	27.2	11.2	1.2	.0
March 7	40+	40+	30.8	18.0	2.4	.0
March 14	40+	40+	38.0	10.4	4.2	.4
March 21	40+	40+	40+	30.0	9.2	1.2
March 28	40+	40+	40+	34.8	14.8	2.4

* Cloudy evenings were avoided, occasionally thin clouds affected the readings.

Official hours of sunset and sunrise gave information for seasonal changes during the period of operation. More valuable information was obtained by taking light readings at sunset. Cloudiness at this time or at dawn greatly lessened the activity of the insects. Light-intensity readings were taken with an accurate photometer and converted into foot-candles. Previous to January 18th, the intensity of the light was too strong, before 6 P.M., to measure with this instrument. Table 5 clearly indicates the change of light intensity from January 18th to March 28th.

Frogs, birds and other predacious forms constitute a part of the environment and may reduce the catch. Frogs have been reported to visit light traps during the night and capture specimens but in spite of frequent checking of the traps, they have never been observed. Birds have frequently been seen, especially at dawn, feeding upon insects on or near the traps. However, they apparently never altered the count. Spiders occasionally visited the traps and may have taken a small toll.

Odors produced by insects such as Meloidae, Staphylinidae or Pentatomidae may attract or repell other insects.

Evenings, when enormous numbers of one species were attracted, they repelled others, or obscured the light and thus reduced the catch. When insects such as Staphylinidae or Corixidae were exceedingly numerous, other insects, especially Lepidoptera, were reduced.

Finally, there is a definite relation between the plants growing in the vicinity of the traps and many of the insects captured in them. A large percentage of insects depend directly or indirectly upon plants for their existence. More than 50 per cent of the species of insects are plant feeders and the Homoptera, including leafhoppers, aphids and fulgorids, are strictly phytophagous. Many Hemiptera, the larvae of most Lepidoptera, the larvae of sawflies, the Orthoptera, with the exception of the mantids, certain groups of Coleoptera such as the Chrysomelidae, Cerambycidae, Elateridae and Curculionidae, are also phytophagous. The attraction of many insects such as aphids, leafhoppers, treehoppers, leaf miners and certain Lepidoptera have been traced directly to the approximation of the traps to their host plants. For this reason a list of the common plants growing in the vicinity of the light traps is given below.

Common plants growing at the Archbold Biological Station in the vicinity of the light traps.

Trees

Bayberry	*Myrica cerifera*
Cabbage palm	*Sabal palmetto*
Grape fruit	*Citrus paradisi*
Guava	*Psidium guajava*
Holly	*Ilex cassine*
Laurel oak	*Quercus laurifolia*
Mandarin	*Citrus reticulata*
Mango	*Mangifera indica*
Mulberry	*Morus nigra*
Persimmon	*Diospyros virginiana mosieri*
Slash pine	*Pinus elliottii*
Swampbay	*Persea palustris*
Sweet orange	*Citrus sinensis*
White bay	*Magnolia virginiana*

Ferns

Cinnamon fern	*Osmunda cinnamomea*
Swamp fern	*Blechnum serrulatum*
Sword fern	*Nephrolepis cordifolia*

Shrubs

Azalea	*Azalea* species
Brazilian pepper	*Schinus terebinthifolius*
Castor bean	*Ricinus communis*
Cress	*Cardamine debilis*
Flame of the woods	*Ixora coccinea*
Golden trumpet	*Allamanda cathartica*
Japanese privet	*Ligustrum lucidum*
Lobelia	*Lobelia glandulosa*
Night blooming jasmine	*Cestrum nocturnum*
Pepper grass	*Lepidium virginicum*
Primrose-willow	*Jussuaea angustifolia*
Stagger bush	*Pieris nitida*
Southern elder	*Sambucus simpsonii*
Turks-cap mallow	*Malvaviscus grandiflorus*
Virginia willow	*Itea virginica*

Vines

Carolina jasmine	*Gelsemium sempervirens*
Cherokee rose	*Rosa laevigata*
Blackberry	*Rubus cuneifolium?*
Dutchman's pipe	*Aristolochia macrophylla?*
Grape	*Muscadinia munsoniana*
Rosary pea	*Abrus precatorius*
Virginia creeper	*Parthenocissus quinquefolia*
Wild balsam apple	*Mormordica charantia*

Sedges and Grasses

Bermuda grass	*Cynodon dactylon*
St. Augustine grass	*Stenotaphrum secundatum*
Natal grass	*Tricholaena rosea*
Sedge	*Carex alata*
Sedge	*Cyperus retrorsus?*

Herbs

Bedstraw	*Galium tinctorium*
Beggar ticks	*Bidens pilosa*
Bitter-weed	*Actinospermum angustifolium*
Caesar's weed	*Urena lobata*
Composite	*Eclipta alba*
Coral plant	*Russelia juncea*
Day flower	*Commelina longicaulis*
Ginger lily	*Hedychium coronarium*
Golden rod	*Solidago fistulosa*
Golden aster	*Chrysopsis graminifolia*
Fireweed	*Erechtites hieracifolia*
Primrose willow	*Jussiaea peruviana*
Nightshade	*Solanum nigrum*
Ragweed	*Ambrosia monophylla*
Rabbit tobacco	*Gnaphalium purpureum*
Red emilia	*Emilia coccinea*
Scarlet sage	*Salvia coccinea*
Snow bush	*Phyllanthus lathyroides*
Wood Sorrel	*Oxalis corniculata*
Toad flax	*Linaria canadensis*

Miscellaneous

Amaryllis	*Hippeastrum vittatum*
Bowstring hemp	*Sansevieria guineensis*
Bunch moss	*Tillandsia recurvata*
Mexican day flower	*Callisia fragrans*
Pineapple	*Ananas comosus*
Saw palmetto	*Serenoa repens*
Seminole bells	*Bryophyllum pinnatum*
Spanish moss	*Tillandsia usneoides*
Sprouting leaves	*Kalanchoe verticellata*
Cactus	*Opuntia* species

Garden crops

Beet	*Beta vulgaris*
Carrot	*Daucus carota*
Cruciferae	Several species
Snap bean	*Phaseolus vulgaris*

(*To be continued*)