A BIOLOGICAL SURVEY OF THE Pribilof Islands, Alaska.

Part II. Insects, Arachnids, and Chilopods of the Pribilof Islands, Alaska.

INTRODUCTION.

By W. L. McAttee, In Charge Food Habits Research, Bureau of Biological Survey.

The bulk of the material upon which the present report is based was collected by Alvin G. and Elsie G. Whitney from October, 1912, to July, 1914, and by G. Dallas Hanna in 1914, 1915, 1916, and 1917. The collectors were employed on the Pribilof Islands during these years by the U. S. Bureau of Fisheries and thanks are due the Chief of that Bureau for turning over their collections of invertebrates to the Biological Survey. It has been of great assistance to have this material for working up simultaneously with the examination of the bird stomachs, reported on in earlier pages, which also for the most part were donated by the Bureau of Fisheries. Material of both classes from this source was supplemented by collections made by Edward A. Preble, of the Biological Survey, in 1914. The Whitneys and Hanna used a system of lot numbers for their collections of invertebrates, and these numbers have in all cases been placed on the specimen labels. Data for lot numbers applying to more than single specimens are reproduced on pages 132 to 138, as they may be useful in future when these collections are distributed. All type specimens mentioned in the following reports as well as the bulk of the remaining material will be deposited in the U. S. National Museum.

Previous general treatises upon the insects and arachnids of the Pribilof Islands are three in number. The first of these is the List of Insects Hitherto Known from the Pribilof Islands, which appeared in the report on The Fur Seals and Fur-seal Islands of the North Pacific Ocean, Part III, pages 547-554, 1899; prepared by E. A. Schwarz, with the assistance in a few groups of M. L. Linell, W. H. Ashmead, D. W. Coquillett, and Herbert Osborn. The second report was contained in several of the Papers from the Harriman Alaska Expedition, mostly published in the Proceedings

Like its predecessors, the present report was brought to completion only through the efforts of a number of specialists, and the Biological Survey desires to put on record its hearty appreciation of their valued cooperation. The authors of parts of the following report are C. P. Alexander, Nathan Banks, R. V. Chamberlin, G. F. Ferris, W. T. M. Forbes, Morgan Hebard, W. L. McAtee, J. R. Malloch, Edith M. Patch, H. L. Viereck, W. R. Walton, and H. F. Wickham. The bureau is also indebted to Dr. J. W. Folsom for assistance in identifying specimens of Collembola.

The progress of knowledge of the insect, arachnid, and myriapod fauna of the Pribilof Group is shown in the subjoined table. Only fully identified forms have been included in the tabulation, generic determinations being ignored.

Species of insects, arachnids, and chilopods reported from the Pribilof Islands.

<table>
<thead>
<tr>
<th>Group</th>
<th>Fur-seal Islands Report, 1899</th>
<th>Harriman Reports, 1900–1904</th>
<th>California Academy Report, 1921</th>
<th>Present report</th>
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<td>Described as new</td>
<td>Number of species</td>
<td>Described as new</td>
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<td>Total</td>
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While a comparatively large number of species of insects are known from the Pribilof Group, discussion of the relations of this fauna to that of other areas can be only tentative for the following
reasons: (1) More than a third of the species recorded in the foregoing table have been described as new from the islands; (2) very few of these have been collected subsequently elsewhere; and (3) the distribution of most of the remaining species is very imperfectly known.

These limitations understood, the following may be said of species known both from the Pribilof Islands and other areas: All of the previously known spring-tails (3 species of Collembola) seem to be Holarctic in distribution. The two species of roaches (Orthoptera) are only waifs on the Pribilofs brought there on ships from the south. Of the 5 kinds of bird lice (Mallophaga), 3 have been recorded from Europe and probably are Holarctic, while 2 are known from other localities in the Pacific Ocean. The distribution of these ectoparasites as well as of the sucking lice (one species on man and two on the fur seal) depends entirely on that of their hosts; by living next the skin of warm-blooded animals they enjoy a habitat almost uniform as to temperature and other essentials and are thus practically exempt, so far as direct influence is concerned, from factors bearing on the distribution of animals in general.

One of the Homoptera recorded from the Pribilofs was described from Bering Island, while of the Heteroptera, one plant bug is Holarctic, another is known from northwestern North America and the northern Pacific Islands, and the bed bug exists practically everywhere that there are permanent habitations of man. Of the caddis flies (Trichoptera), one is known from the mainland of Alaska and another is Holarctic. Of the several species of moths (Lepidoptera), 2 occur in northwestern North America, 2 in Alaska, 4 in Arctic America, and 2 are Holarctic.

The distribution of the beetles is better known than that of most of the orders; 9 species recorded from the Pribilofs occur also in northwestern North America, 14 in Alaska, 7 in northern North America, and 6 in Alaska and Siberia; while 11 are Holarctic and 2 are cosmopolitan, being carried about in commerce. Of the flies (Diptera), 3 species are known from northwestern North America, 13 from Alaska, 12 from northern North America, and 9 are Holarctic.

Hymenoptera exceed in number of species any other order of insect on the Pribilofs, but their distribution is very imperfectly known. Five of those collected elsewhere have been taken in northern North America, 5 in Alaska, and 9 on other islands of the northern Pacific, while 1 is known to be Holarctic.

Summarizing the distributional data for all of the orders, it appears that the largest number of species the Pribilof Islands are known to have in common with another region is 35, with Alaska; 30 are Holarctic; 28 occur more or less throughout northern North
America; 15 in northwestern North America (usually including Alaska); 14 on other islands of the northern Pacific; 6 in Alaska and Siberia; and 6 are "tramp" species, parasitic on man, or distributed in commerce. As information on the distribution of insects increases it is probable that a large proportion of the Pribilof fauna will prove to be Holarctic.

Lot numbers and field notes of O. Dallas Hanna, from St. George Island, 1914.

1. Diptera, 96 specimens collected about fox houses and on beach among bowlders. The most abundant species, the very woolly one, has become abundant the past few days in the outhouses, and the fox and meat houses, and among the bowlders on the beach. The smooth-bodied species so common in the lot sent to Washington in May is becoming scarce. June 4.

2. Diptera, 30 specimens, 4 species. In the grass and on very wet soggy ground near village landing. June 4.


7. Diptera, 14 specimens. Found on several species of flowers and in grass. When approached it darts into the grass but never tries to fly away. Uplands. June 8.


9. Diptera, 64 specimens. The most abundant species is one which is very common along the beaches, living upon the decaying marine algae. Near North Rookery. June 10.


12. Coleoptera, 23 specimens. 2 water beetles seen eating a dead earthworm. Small very black beetles found only on bowlders of beach near East Landing. June 10.


17. Diptera, 12 specimens, long legged. In wet places, mostly, but some seen crawling over grass far from water. None seen flying. Those with wings best developed from Spring Creek, Garden Cove. June 14. One seen with the very fuzzy fly in No. 18 beneath it; apparently they were fighting.


28. Coleoptera, 10 specimens, toward East Rookery from Village; 2 females seen depositing eggs in wet packed earth which was clear of vegetation. Each had made a trench about 2 inches long, very shallow, and was depositing the eggs in a hole in the trench. The holes were ½ to ½ inch deep. June 16.
40. Diptera, 4 specimens (all seen) in bog plants, border Gull Lake beside Staraya Artel Rookery; caught on wing. June 17.
44. Diptera, 6 specimens. Around a sphagnum bog ½ mile west of Village. June 17.
47. Insects and spiders, 30 specimens from toward North Rookery. June 25.
48. Lepidoptera, 17 specimens from top of ridge, Zapadni Trail. June 27.
49. Insects, 75 specimens approximately. Toward Zapadni. June 27.
53. 10 Coleoptera from trail toward Zapadni. July 4.
54. 4 wood ticks, 2 species. From Tolstoi Point. Found under bowlders just above surf line on beach. July 9.
55. 50 insects, many species. Small black beetle is very common in some places, always found at surf line among bowlders.
Lot numbers and field notes of Alvin G. Whitney and Elsie G. Whitney, from St. Paul Island, unless otherwise stated, 1912 to 1914.

1. 3 caterpillars in grass. Telegraph Hill. October 11, 1912.
2. Galls from Salix. Adult insects had emerged during September. (Slide No. 5 may be larvae from willow galls, No. 14 of collection). Flat north of Telegraph Hill. Autumn, 1912.
3. 9 larvae, 1 spring-tail, found in bottom of bag in which willows and mosses had been collected, March 23. St. Paul Island. Southwest Bay to Southwest Point. March 23, 1913.
2. 2 coleopterous larvae. At roots of native plant. May 14, 1913.
22. 5 chrysalids of black and red caterpillars. Caterpillars were collected on Lukanin Hill about May 1. After two days in the laboratory, they began to spin cocoons in this bottle, and finished within a day, when they were placed in alcohol. May 14, 1913.
24. 2 parasitized dipterous flies. 1 parasitic mite from one of the flies. Company House bathroom. May 16, 1913.
27. 3 dipterous flies. Company House bathroom. May 16, 1913.
28. 2 dipterous flies. Laboratory. May 16, 1913.
32. Pupae in grass stems growing in shelter of rock crevices. 1 hymenopterous fly, which emerged from one of these pupae in warmth of laboratory. Tolstoi Hill. Spring (probably about May 20), 1913.
36. 10 bumblebees. June 5, 1913.
37. 2 (parasitized?) gnats; nearly dead when found. Laboratory. June 5, 1913.
39. 6 gnats. From a great many on window, probably hatched from native Sagina transplanted to Laboratory a few days before. Laboratory. June 5, 1913.
40. 2 crane flies. In grass, 1 at Kitovi and the other on Reef Peninsula. June 9 and 10, 1913.
41. 1 fly and pupal skin. Pupa collected June 10, hatched June 20. June 20, 1913.
42. 6 flies. The first of this species seen this season. Sand dunes, Reef Peninsula. June 11, 1913.
43. 8 centipedes. From crevices and holes in vesicular lava, under a thin layer of soil. Coll. by E. G. W. Centipedes were found also near bowlder beach just northeast of Little Polovina Rookery, July, 1914. (Prof. G. H. Parker collected specimens on Akutan Island, in the Aleutians, June, 1914.) Gorbateh Cliffs. June 11, 1913.
44. 3 flies. Abdomens covered with white woolly hairs. Sand dunes, Reef Peninsula. June 11, 1913.
47. 4 Carabidae. In grass and moss. Southwest Bay. June 17, 1913.
49. 2 ground beetles. A very common form. Tolstoi Hill. June 18, 1913.
50. About 20 hymenopterous flies and their pupa-cases. Egg cluster collected by E. G. W., May 29, flies hatched out some time before June 20, in the pill box in which collected. May 29, 1913.
51. 12 larvae. Orange-colored in life. Abundant on willow catkins in the “pussy” stage, slightly before blossoming. The larvae were secreted among the buds in the compact heads. These willows covered with galls just beginning to develop. Flat north of Telegraph Hill. June 22, 1913.

52. 4 mites. From plants. June, 1913.
56. 2 weevils. June 20, 1913.
60. 2 flies; 1 crane fly; 1 beetle; 1 spider. Otter Island (6 miles from St. Paul). July 3, 1913.
64. 2 flies. Same 2 species as No. 63. Company House. July 6, 1913.
66. 2 flies. Duplicate of species Nos. 64 and 65. Several eggs. The eggs were ejected by larger fly in its struggles to escape from vial. Company House. July 6, 1913.
69. 8 aphids. On lettuce. Originally on Pedicularis blooms brought to laboratory June 22, and escaped to lettuce bed where they multiplied rapidly. Laboratory hotbed. July 10, 1913.
74. 4 blue flies. Collected by E. G. W. Zoltoi Beach. July 17, 1913.
75. 2 mites. On Montia fontana. July 17, 1913.
77. 12 larvae. Abundant everywhere around the roots of grasses and of herbs, and especially under beds of moss on the roots of which it feeds, killing the moss over considerable areas. Under such a moss bed I found as many as 20 to the square foot. This larva is found over all the island in grassy or mossy places and all through the summer season. It must also be of considerable ecological importance, because of its food value to the birds and foxes. The foxes will dig over large areas of moss beds to feed on these larvae. Was unable to find the species in adult form. Could not seem to raise adults in laboratory by keeping larvae with one of the food plants. It may possibly be the larval form of the crane fly, which is very abundant. Color not altered by pickling in alcohol. St. Paul Island. Reef “Parade Ground.” July 18, 1913.
78. 16 larvae. Same as No. 77. July 17, 1913.
87. 7 mites. This form very abundant, found everywhere in moss and on flowering plants. July, 1913.
91. 20 gnats. Big Lake. Swarms of these insects were being driven by the breeze southeastward off of the lake. These clouds of gnats noticeable throughout July and August. July 22, 1913.
92. 10 gnats. Same as No. 91. Big Lake. Collected from our coats as they swarmed past us while driving along the lake. July 22, 1913.
93. 3 small gnats. Big Lake. Collected at same time with larger ones from lake shore. July 22, 1913.
94. 3 Diptera, 1 bug, 2 Neuroptera, 1 moth, 1 beetle. Northeast Point Peninsula. July 22, 1913.
95. 11 Hymenoptera. Collected by a native boy who said he found a nest of them. July 23, 1913.
96. 4 caterpillars. Collected by a native September 8; then left in a dry box until October 6, in the hope that they would pupate. None did so; several dried up. The specimens preserved were the ones left living October 6. October 6, 1913.
98. About 10 larvae from mud of dried-up pond, where \textit{Leucosticta} had been
scratching for them. This pond, about one-fourth mile long and
eighteen inches deep, was dry from August 5 to mid-September. Dur­ing
this time its whole mud bottom was scratched entirely over by
turnstones to get at these larvae, which were abundant. Color of
larvae \textit{ruby-red}. Mud bottom of Village Pond. August 10, 1913.

102. 4 water beetles. Creek outlet of Antone Lake. Fall, 1913.

104. 33 mites from \textit{Stellaris}. September 13, 1913.

105. 6 Mallophaga. On choochkie (\textit{Aethia pusillus}). November 4, 1913.

106. 11 Mallophaga. On \textit{Aethia pusillus}. Same as No. 105. November 4, 1913.


108. Lice on \textit{Mus musculus}. November 16, 1913.


110. Lice on \textit{Mus musculus}. Duplicate of No. 108. November 16, 1913.

111. 6 caterpillars. On a sandy road. Halfway Point. August 1, 1913.

112. 5 caterpillars. Collected September 8 by a native, same as No. 96, left in
box to pupate, but dried up without transforming. October 6, 1913.

113. 8 bumblebees. Collected by a native who killed them in grease. North­east Point. May 31, 1913.

116. 3 caterpillars. About 300 feet up on bare south cinder slope, where the
snow was melted off and the surface of the cinders warmed by the sun.
All insects in the wet, half-frozen tundra below were still dormant.
Polovina Hill. March 29, 1914.

117. 2 larvae and 3 pupal shells. Found close together in moss on the flat
near Polovina Lake. A fox was digging up insects near by. March
29, 1914.

118. 3 larvae; 3 rove beetles. From moss on flat near Polovina Lake. March
29, 1914.

119. 3 small beetles and several mites. April 5, 1914.

120. 2 aphids and one empty aphid skin, and 1 hymenopterous fly. The live
aphids were bluish with whitish "bloom"; collected in moss on scoria
bank back of "Company House." April 7, 1914. The fly emerged ap­parently
from one of these aphids about April 18, 1914.

121. 1 beetle. Village Hill. April 15, 1914.

126. 2 lice from Aleut child's hair. April 22, 1914.

127. 4 Mallophaga, from European widgeon shot May 9 at Icehouse Lake.
May 11, 1913.

128. 2 beetles. Male and female mating. From surface of tide pool under

129. 2 insects. Found jumping like springtails on the bare sand dunes, Dia­mond Hill dunes. May 16, 1914.

131. 4 beetles. May 22, 1914. 5 beetles from Zoltoi Beach sand dunes. May
19, 1914.

132. 6 flies; 8 mites. From privy. The mites were parasitic on the flies,
sometimes two or three mites on a single host. May 19, 1914.

133. 3 coleopterous larvae. Lukannin Hill. May 19, 1914.

3 coleopterous larvae. Zoltoi Beach sand dunes. May 22, 1914. These
beetle larvae, resembling those of "potato beetles," are exceedingly
common all summer, and feed on a large variety of plants, including
\textit{Pedicularis}. Probably are the larval stage of the species in No. 145
and the largest species in No. 189.

135. 9 rove beetles. Zoltoi Beach sand dunes. May 22, 1914.
138. 10 weevils. May 19, 1914.
139. 6 mites. Parasitic on flies. Same as in No. 132. May 19, 1914.
141. 7 mites. Parasitic on flies. Same as Nos. 132 and 139. May 23, 1914.
143. 6 Diptera. May 23, 1914.
146. 6 beetles, May 19, 1914. 7 beetles from Zoltoi sand dunes May 22, 1914.
147. 2 beetles, May 21, 1914. 1 beetle, Zoltoi sand dunes, May 22, 1914.
149. 8 click beetles. This species is found abundantly under spreading Mer tensia maritima plants. Zoltoi sand dunes. May 22, 1914.
150. 39 beetles, Lukanin Hill, May 19, 1914. 3 beetles, Zoltoi sand dunes, May 22, 1914, 1 beetle, July 24, 1914.
152. 13 Diptera. From outside of laboratory window. May 23, 1914.
154. 4 Diptera. May 23, 1914.
155. 2 Diptera. Gray in color, with 2 diagonal bands on under side of abdomen. Laboratory. May 23, 1914.
156. 10 Diptera and their parasitic mites. From outhouse. May 23, 1914.
159. 6 beetles. These beetles were taken when a very heavy wind had been blowing all day, and they had been swept into the hollows among the dunes. Their wings protruded from under the half-expanded elytra, indicating that they had been in flight. I have never seen any other beetles on the Pribilofs that could fly. This was the only time I saw this species, which was fairly abundant in the one locality this one day. I saw perhaps twenty or more in the sand hollows. They were velvety brown in color, with blotches of darker brown, and when touched drew their legs into grooves on the body, so they were then as smooth as a bean. (Same as No. 166.) Zoltoi sand dunes. May 23, 1914.
167. 5 beetles. May, 1914.
168. 12 gnats, flying in a swarm by laboratory. Spring, 1914.
169. 1 bed bug, from native boy's clothes. 2 ———— (?). Dark bluish in life, except the young ones, which are white. Probably same species as Nos. 13 and 200. These insects are common in damp herbage, especially in moss beds, and are sometimes seen in myriads in crevices of low ledges along the shores and crowded together on the surface of tide pools. April, 1914.
170. About 25 crane flies. 1 harvestman. Crane flies were crawling everywhere at this time, and many were mating. Tolstoi sand dunes. About June 1, 1914.
174. 3 mites, 1 moth, 1 hymenopteron, 1 crane fly. Spring, 1914.
176. 1 fly and several pupa cases. The pupa cases were found June 14 in the interstices of the nasal bones of a fur seal skull on the killing field. From these one fly hatched out in the vial June 20. Near village. June 20, 1914.
180. 12 beetles. From crevices and face of cliffs on southwest side of Sealion Rock, an islet less than ¼ mile long and about ½ mile from St. Paul Island. The center of the island is about 60 ft. high and supports a little grass (Glyceria) and a few herbs. The island is similar in character to Walrus Island (12 miles distant), where a rare species of Coleoptera exists. Possibly this is the same species. June 29, 1914.

181. 44 beetles; 2 beetles; larvae. From face of cliffs and crevices of rocks on southwest side of island. Same as No. 180, and probably same species as No. 173. Sealion Rock. June 29, 1914.


183. 5 moths. June, 1914.

184. 3 moths. June, 1914.


187. 56 beetles (several species). Collected from mud shore of village pond. Many were mating. June 30, 1914.

188. 60 carabid beetles. Grass-covered upland. East Landing to village wells. These carabids are abundant and especially active and noticeable during June and July. June, 1914.


190. 2 coleopterous larvae. June, 1914.


192. 4 Mallophaga. On Rissa t. pollicaris. These were from the same bird as the mites in No. 191, namely, E. A. Preble’s catalog No. 2239. July 4, 1914.


194. Lice on Sorex pribilofensis. (Same as 193.) July 5, 1914.

195. 55 Diptera. This species was very abundant and active on Chrysanthemum arcticum flowers (in full bloom on this date) in salt marsh on north side of Salt Lagoon. Do not think I’ve seen it elsewhere on the Pribilofs. “Salt Lagoon” marsh. July 24, 1914.

196. 4 rove beetles. July 24, 1914.

197. 4 white larvae. 1 immature click beetle. (From underside of moss bed.) Reef “Parade Ground.” July 28, 1914.

200. 2 ————. (Probably same species as Nos. 13 and 169.) Found in moss. Spring, 1914.

201. 2 click beetles, 1 small beetle. Summer, 1914.

204. 3 larvae, 1 beetle. Summer, 1914.

210. 7 Diptera. Summer, 1914.

212. 3 beetles. Summer, 1914.
APTERYGOTA.¹

By W. L. McAtee, Bureau of Biological Survey.

Family PODURIDAE.

Neanura gigantea Tullberg.


Two lots collected on St. Paul Island in spring of 1914 by A. G. Whitney, who says: "Dark bluish in life, except the young which are white. These insects are common in damp herbage, especially in moss beds, and are sometimes seen in myriads in crevices of low ledges along the shore and crowded together on the surface of the tide pools."

Aphorura dentata Folsom.


Originally described from material including one specimen collected on St. Paul Island, August 1, 1897.

Isotoma viridis Bourlet.


Two lots collected on St. George Island, June 8, 10, 1914, by G. D. Hanna, and two from St. Paul Island, by A. G. Whitney, one collected May 19, 1914. The remark, "common in tundra moss" accompanies last lot.

Isotoma violacea Tullberg var. mucronata Axelson.

*Isotoma violacea* Tullberg, Tycho. op. cit., p. 36. [Siberia.]


Several specimens of this variety representing a species previously known, according to Dr. J. W. Folsom, only from Norway, Sweden, Finland, and Greenland, were found in the stomach of a *Leucosticte griseonucha*, collected on St. George Island, August 2, 1920.

¹ The insects of this order were identified by Dr. J. W. Folsom. He has recorded from the Pribilofs three of the species here mentioned, in his admirable report on the Apterygota in Papers from the Harriman Alaska Expedition, XXVII, Proc. Washington Acad. Sci., vol. 4, pp. 87–116, pls. 4–7, March 27, 1902.

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ORTHOPTERA.

By Morgan Hebard, Academy of Natural Sciences of Philadelphia.

Family BLATTIDAE.

Subfamily PANCHLORINAE.

Panchlora cubensis Saussure.


A single green cockroach (♀) collected on St. Paul Island, in 1916, by G. Dallas Hanna apparently represents this common and widely distributed tropical American species, which is frequently introduced into the temperate regions of North America in bananas. As the northernmost point at which a species of the genus is known to be native is Brownsville, Tex., there is no doubt that the present is an adventive specimen, having been transported to the Pribilofs on board ship.

It agrees fully with West Indian material before me, except in having the interval between the eyes exceptionally wide (.5 millimeter) for females of the species, nearly three-quarters the occipital ocular width. The interocular width is subject to variation in the species, but in the great majority of females approximates one-third the occipital ocular width. For a detailed discussion of cubensis see Mem. Amer. Ent. Soc., No. 2, p. 198 (1917).

Blatella germanica Linnaeus is recorded as having been introduced into the Pribilof Islands at least twice and a preserved specimen has been reported from St. George. (Van Duzee, E. P., Proc. Calif. Acad. Sci., Fourth Ser., 11, p. 193, Nov. 1921.)—W. L. M.
MALLOPHAGA.

By G. F. Ferris, Assistant Entomologist, Stanford University.

All of the material here reported on was collected by A. G. Whitney on St. Paul Island. While the collection is small it contains two very interesting records, two of the species not having been recorded previously from North America, their host records also being new.

Docophorus lari Denny.

Four specimens of this widely spread gull-infesting species from the Pacific kittiwake, Rissa tridactyla pollicaris. It has previously been recorded from the same host.

Docophorus merguli Denny.

Several specimens from the least auklet, Aethia pusilla. This species has previously been recorded but twice, both times from the little auk or rotchie, Alle (Mergulus) alle, of Europe. The specimens at hand agree very well with specimens from the latter, sent us by Mr. Waterston.

Nirmus maritimus Kellogg and Chapman.

Several specimens from Aethia pusilla. This record also is new. Another species of Nirmus (N. citrinus Nitzsch) has been recorded from the same host and this record may, perhaps, refer to the same species as the two are not very different.

Menopon lutescens Nitzsch.

Several specimens from Aethia pusilla. This is also a new record, both as to host and locality, the species previously having been recorded from Alca torda and Alle (Mergulus) alle of Europe. The determination of any species of Menopon is always attended with uncertainty, but this species has been figured by Waterston (Proc. Royal Phys. Soc. Edinburgh, vol. 18, No. 4, pp. 266–267, f. 3, 1912), and as it is apparently rather characteristic of the auklet group the determination is reasonably safe.

Trinoton luridum Nitzsch.

Four specimens of this common duck-infesting species from the European widgeon, Mareca penelope. It has previously been recorded from the same host.
ANOPLURA.

By W. L. McAtee, Bureau of Biological Survey.

Family PEDICULIDAE.

Pediculus capitis De Geer.


Five specimens are in the collection, all collected from the heads of Aleuts on St. Paul Island in April and in "summer."

Family ECHINOPHTHIRIIDAE.

Antarctophthirus callorhini Osborn.


This species was originally described from specimens collected on fur seals from the Pribilof Islands.

Echinophthirius fluctus Ferris.


Mr. Ferris kindly gives me permission to publish the fact that this species, originally described from the Steller sea lion, has also been taken on the fur seal, and must therefore occur on the Pribilofs.
HOMOPTERA.

By Edith M. Patch, State Entomologist, Maine Agricultural Experiment Station.

Family APHIDIDAE.

(Plate VIII.)

Macrosiphum constrictum, new species.

*Alate viviparous female.*—Beak short, reaching second coxa. Antenna 3.09 mm. in total length with joints measuring: I, .13 mm.; II, .07 mm.; III, .78 mm.; IV, .49 mm.; V, .53 mm.; VI, base including sensoria .22 mm., spur .87 mm. III with nine sensoria in a row. Cornicle .65 mm. long, slightly but distinctly swollen at middle of distal half and constricted a little near the tip, where it is marked by faint reticulations for about .04 mm. There is nothing particularly distinctive about the venation of the wing, which is 3.55 mm. in length.

*Apterous viviparous female.*—Beak short, reaching second coxa. Antennae from two individuals were measured, one of which was 2.72 mm. long with joints as follows: I, .14 mm.; II, .08 mm.; III, .7 mm.; IV, .51 mm.; V, .5 mm.; VI, base including sensoria .22 mm., spur .57 mm. This antenna had nine sensoria on III. The other antenna measured 2.93 mm. with the joints as follows: I, .14 mm.; II, .10 mm.; III, .72 mm.; IV, .42 mm.; V, .49 mm.; VI, base including sensoria .25 mm., spur .81 mm. III in this case with six sensoria. Cornicle .63 mm. long, with shape and reticulations like that of the alate female except that the bulge of the distal half is slightly more pronounced.

*Apterous oviparous female.*—Beak short, reaching second coxa. Antenna 2.28 mm. in total length, with the joints measuring: I, .14 mm.; II, .09 mm.; III, .6 mm.; IV, .38 mm.; V, .39 mm.; VI, base including sensoria .2 mm., spur .48 mm. Sensoria of III variable in number. One individual had two on one side and three on the other. Cornicle .57 mm. long with shape and reticulation similar to those of the viviparous females. The tarsus to base of claw is .15 mm. long. The hind tibia is not perceptibly swollen.

As aphids vary somewhat in size in different collections and as the number of antennal sensoria is subject to fluctuation, the foregoing items should be taken as approximate rather than absolute.

Described from one alate viviparous, two apterous viviparous, and two apterous oviparous females.
Cotypes.—Locality St. Paul Island. Collection (Lot No. 69) taken by A. G. Whitney, June 22, 1913, from Pedicularis, and escaped from the laboratory to lettuce bed, where they multiplied rapidly. Specimens removed from lettuce July 10 comprised one apterous and one alate female and some nymphs. Collection (Lot No. 68) taken by A. G. Whitney from Pedicularis comprised two apterous oviparous females and one apterous viviparous.

Metatype, collected by A. G. Whitney, St. Paul Island, on Saxifraga, spring 1914, comprised one nymph (Lot No. 164).

Ideotypes collected by G. D. Hanna, St. George Island, June 16 (Lot No. 33) and June 17 (Lot No. 43), 1914. Nymphs only. Food plant not recorded.

This species shows certain resemblances to Macrosiphum antirrhinum (Macchiati) as described and figured by Theobald, but the short beak of M. constrictum and the antennal sensoria of the apterous viviparous female and several minor differences serve to distinguish it. The most striking characters of M. constrictum are the slight dilation of the cornicle, with its very restricted area of faint distal reticulation; the short beak; the long slender basal portion of antennal joint VI and the short-pointed antennal setae.

Another species of plant louse, Nectarophora insularis, was described from St. Paul Island by Theo. Pergande (Proc. Washington Acad. Sci., vol. 2, p. 515, Dec. 20, 1900); and a fulgoroid leaf-hopper, Delphax stejnegeri Ashmead, originally described from Bering Island, has been recorded as occurring on the Pribilofs (Ashmead, W. H., Harriman Alaska Expedition, vol. 8, p. 130, 1904).—W. L. M.

EXPLANATION OF PLATE VIII.

Details of Plant Louse (Macrosiphum constrictum).

Fig. 1. Antenna of alate female.
Fig. 2. Antenna of apterous viviparous female.
Fig. 3. Antenna and tarsus of apterous oviparous female.
Fig. 4. Cornicle of apterous viviparous female.
Fig. 5. Cornicle of apterous oviparous female.
Fig. 6. Cornicle of alate female.
Fig. 7. Wing of female.

Details of Plant Louse (Macrosiphum constrictum).
(Explanation on page 144.)
HETEROPTERA.

By W. L. McAtee, Bureau of Biological Survey.

Family MIRIDAE.

Irbisia sericans Stal.

Leptomerocoris sericans Stal. C. Beitrag zur Hemipteren-Fauna Siberiens und des Russischen Nord-Amerika. Entomologische Zeitung (Stettin) 19, p. 188, 1858. [Sitka.]


This, the only species of Heteroptera in the collection, has a wide distribution in Alaska and on the neighboring islands, and is known to occur as far south as Oregon. The specimens at hand were obtained on St. Paul Island in June, July, and September, and on St. George Island in August.

Orthocephalus saltator Hahn, also of the family Miridae, was collected on St. Paul Island by Barrett-Hamilton (Schwarz, E. A., the Fur Seals and Fur-Seal Islands of the North Pacific Ocean, Part 3, p. 552, 1899). Cimex lectularius Linnaeus also is known to be present on the islands.
TRICHOPTERA.

By NATHAN BANKS, Museum of Comparative Zoology, Harvard University.

Family LIMNEPHILIDAE.

Limnephilus kincaidi Banks.

Two from St. George Island, August 4 and September, and one apparently this species from St. Paul, August 17. Originally described from St. George Island.

Arctoecia consocia Walker.

One from St. Paul Island, August 16.

Asynarchus simplex Banks.

Three from St. Paul Island, July 14 and 22, and one apparently this species, from St. George, August 4. Originally described from St. Paul Island.

A description of the larva of this species from the Pribilofs, has been published by R. A. Muttkowski, Bull. Wisconsin Nat. Hist. Soc., vol. 13, N. S., No. 1, pp. 42-45, March, 1915.—W. L. M.

Chilostigma praeterita Walker.

Three from St. George Island, June 17, and St. Paul Island, May 1, and “Summer.” In these specimens the bristle-bearing areas or the posterior warts, prothoracic lobes, mesothoracic stripes, and tegulae are yellowish or reddish. The typical form was described as having these black, but they are pale in some of my European specimens, and I believe they are normally pale; sometimes drying out dark.

In addition to the above-mentioned species, Anabolita simplex Banks has been recorded from St. Paul Island. (Van Duzee, E. P., Proc. Calif. Acad. Sci. Fourth Ser., 11, p. 193, Nov., 1921.)—W. L. M.
LEPIDOPTERA.

By WM. T. M. FORBES, Department of Entomology, Cornell University.

There are nine species represented in this little collection, besides some larvae which can not be surely identified. The complete absence of butterflies is surprising, but may perhaps be explained by some peculiarity of the climate. The same thing occurs in Iceland, although as a rule butterflies are common in the Arctic regions.

There seems to be a slight tendency for the two islands, St. George and St. Paul, to have different local forms, but it is not marked enough to be certain. One specimen of *Hyphoraia subnebulosa* from St. George is exceptionally pale and shows some differences of marking but the other is like those from St. Paul. *Psychophora sabinii* is represented by a suffused specimen from St. Paul, while all those in good condition from St. George show crisp clean-cut markings, but such suffusion occurs commonly in the Arctic and is likely to be an individual rather than a racial character.

Family ARCTIIDAE.

*Hyphoraia subnebulosa* Dyar.

Three from St. Paul, June; 2, St. George, July. The type, in the U.S. National Museum, comes well within the range of this series, but is in poor condition. The thorax of the type in particular is beyond description. As the specimens in this series show it, the collar is yellow, with some black hairs along the posterior edge, the disk of the thorax is red-brown, concolorous with the wings, edged on each side by a broad yellow stripe, each side of which the black underscaling shows more or less distinctly as a black line. The upper two-thirds of the tegulae is chocolate brown, while the part just over the base of the wing is black in front and yellow behind. The hair is loose and erect in the male, but in the female the vestiture of both body and legs is smooth and close, like that of Apantesis. The series in the National Museum (from a variety of places) indicates that there may be a large number of minor local forms.

Family NOCTUIDAE.

*Agrotiphila alaskae* Grote.

Three males and one female, from St. George, appear to be of this species. The males are normal enough. The female has reduced,
lanceolate wings of half the area of the male's, with no black markings at all. The specimen from St. George is marked in two shades of pale olive, but one from Popof Island in the National Museum is purple-brown. The antennae are serrate and fasciculate, not simple as Hampson describes them. Superficially the moth could be easily mistaken for *Pachnobia wockei*.

*Anarta richardsoni* Curtis.

One from St. Paul. The hair on the deeply sunken eyes is sparse and easily overlooked.

**Family GEOMETRIDAE.**

*Psychophora sabinii* Curtis. (*Scinneria* Dyar).

There can be no doubt that this is *P. sabinii* of Curtis, as has been most generally believed and as has been specifically noted by Barnes and McDunnough since the preparation of this manuscript. They have proposed for it the genus *Barrovia*. "*Psychophora*" *fasciata* has nothing to do with this and no special resemblance to Curtis's figure. In it the pectinations of the antennae are as broad at the base as farther out, while in our form as well as in Curtis's figure they are shown as narrowing at the point of attachment and apparently articulated to the shaft. In *fasciata* the fringe is dark at the base with a white tip, the hind wing is dark-veined without transverse lines, the fore wing has no dark shade at the base; the t. a. line is angled on the cell only, while the t. p. line is not at all toothed. The antennae are serrate at the tip. In all these points *fasciata* differs from Curtis's figures and from the specimens in this lot. *Fasciata* is a noctuid, as shown by the venation and the large ocelli.

The long series from St. George (23 specimens, part of which look as if they were collected in alcohol) are very crisply marked and look like *Trichochlamys polata*. Some of them tend to show the four pale ovals in the median area which Curtis figures, and one is chocolate brown with contrasting white-filled lines. There is some tendency to suffusion, especially in the St. Paul specimen, but nothing like the forms *frigidaria* and *polaris*.

**Family PYRALIDAE.**

*Titanio* sp.

St. Paul.

*Phlyctaenia* sp.

Too poor to identify with certainty. It may possibly be *P. washingtonialis* Grote. St. George.
INSECTS OF THE PRIBILOF ISLANDS.

Family PTEROPHORIDAE.

Platyptilia sp.

It seems too far north for the Californian P. modesta, but there seems to be nothing else as close to it among the species of Platyptilia with obsolescent scale tuft. P. pterodactyla as described by Walker and as figured by Walsingham is a paler species with a pure white area and a couple of black dashes on the first feather, while this species is almost immaculate mouse-gray. The usual black scale-tuft in the third feather of the hind wing is represented by four or five scattered scales. Three from St. George. August.

Family TORTRICIDAE.

Sparganothis moeschleriana Wocke.

All the specimens I have seen of this species show the venation and other structures of Sparganothis, group Cenopis, and the markings would indicate the same reference; 1, St. George, August.

TINEID.

Family Undetermined.

Too poor to name, 2 from St. George, June.

E. P. Van Duzee lists from the Pribilofs the pyralid, Phlyctaenia washingtonalis Grote, the tortricid, Argyroploce schulziana Fabricius (with a query), and the oecophorid, Borkhausenia pseudospretella Stainton. (Proc. Calif. Acad. Sci., Fourth Ser., 11, pp. 194–5, Nov. 1921.) H. W. Elliott stated (Report on the Seal Islands of Alaska, Rept. 10th Census, Vol. 8, 1884, p. 12) that "a very few species of butterflies, principally the yellow Nymphalidae, are represented by numerous individuals." However, no butterflies have thus far been collected on the Pribilofs, and it is likely that Elliott's note was merely from recollection, and perhaps had reference to the rather profusely yellow-marked Hyphoraia.—W. L. M.
COLEOPTERA.

By Prof. H. F. Wickham, Department of Applied Zoology, University of Iowa.

The present collection of Coleoptera is probably by far the most complete of any ever brought out from the Pribilof Islands. Many of the species were obtained in large series, exhibiting wide variation and giving valuable information as to time of occurrence. The fact that both St. George and St. Paul were consistently worked for material enables us to form an opinion as to the faunal relations of these islands with each other; and finally it should be noted that a few species were obtained that had not previously been reported from Alaska.

Two features stand out very clearly from examination of the material and data—first the long season over which the adults of many species may be found, and second, the great individual variation. Color, sculpture, size, and even outline appear to have become inconstant as if the restraints which ordinarily hold the species within narrow limits had been relaxed. An explanation of this variability which seems to me probably fundamental was suggested by Alexander Wetmore, of the Biological Survey—namely, close interbreeding brought about by the narrow quarters to which these insects are confined. A contributing cause may perhaps be found in the rigorous climatic conditions which must often subject the forming chitinous exoskeleton of the newly emerged adult to severe physiological stress, resulting in modifications of the surface sculpture and possibly even of its texture. Retardation or hastening of evaporation is known to affect the intimate sculpture of the tegument in semiarid districts and may well have an influence here.

Several species of beetles have been found upon one of these islands which are not yet known to occur upon the other, but I do not see any evidence of the development of different races where a given species inhabits both St. Paul and St. George, even though a large percentage of the Coleopterous fauna is incapable of flight and probably rarely crosses the distance of forty miles or so between the land areas. A few cosmopolitan beetles are becoming introduced by commerce.
INSECTS OF THE PRIBILOF ISLANDS.

Family CARABIDAE.

Genus Carabus Linnaeus.

Carabus truncaticollis Escholtz.

Numerous specimens are contained in the collections from St. Paul and St. George. Those from the former island were found in every month from May to October, and those from the latter island from April 14 to September 10. Taken as a whole, the series ranges from a vivid green through duller and bronze greens, red or copper bronzes to a brown bronze. In general the greens predominate, but the dates do not indicate any relation between season and color. Neither is there any correlation between color and locality, as specimens from either island show practically all of the intergrades. The legs vary from reddish yellow, with dark tarsi and tibial apices, to piceous. The size runs from 15.5 mm. to 20 mm. Several larvae, apparently about fully grown, are dated May 23 and June.

Genus Nebria Latreille.

Nebria bifaria Mannerheim.

Three specimens, St. Paul, without date other than "Summer, 1914." Already known from this island as well as from Alaska, Siberia, and Kamchatka.

Genus Pelophila Dejean.

Pelophila eschscholtzii Mannerheim.

Three specimens, St. Paul, one without date, the other two taken August 16; numerous specimens June 30. The first-mentioned example is distinctly metallic in color with greenish elytral border; the others are nearly black above, the elytra castaneous. Great variation is shown in number and position of the elytral foveae, even on the two sides of the same individual.

Genus Patrobus Dejean.

Patrobus septentrionis Dejean.

St. George and St. Paul. The dates run through every month from June 25 to September 3. A common and widespread species.

Genus Pterostichus Bonelli.

A very fine series of small pterostichi, belonging to the subgenus Pseudocryobius, was brought out by the collectors. It contains representatives of all the species hitherto known from the Pribilof group and also a few others apparently described from different parts of Alaska. The separation and identification of these forms has been a difficult task and the results of my study are by no means
satisfactory. In common with better known and more readily rec­
ognized insects like Carabus truncaticollis and Chrysomela subsul-
cata, these pterostichi appear to vary enormously in size, color, and depth of sculpture. There seems, also, to be some variation in thoracic outline; the basal foveae are affected by the sculptural inconstancy and the number of elytral striae of one individual. In consequence the characters ordinarily used for specific distinction become much lessened in value and one has to depend, in great part, upon facies for separation. Nevertheless the only basis for assign­
ing most of the species to their names, most of which were given by Dejean and the early Russian writers, is found in these same char­
acters and the attempt has been made to use them with discrimina­
tion. A study of the species of Pseudocryobius of both hemispheres is absolutely needed for the proper delimitation of our native forms.

_Pterostichus vindicatus_ Mannerheim.

St. George, June, July 16; St. Paul, June. While placed in this species on account of the much finer elytral striae, the identification must be considered provisional. This is the first record for the Pribilofs.

_Pterostichus ventricosus_ Eschscholtz.

St. George, April 17, May 6, June 4 and 25, July 16, August 4, September. St. Paul, June.

_Pterostichus subexaratus_ Mannerheim.

St. George, April 1 and 17, May 6 and 17, August 4, September 2; St. Paul, June. Some doubt attaches to this identification. The species has not hitherto been recorded from these islands.

_Pterostichus pinguedineus_ Eschscholtz.

St. Paul and St. George, taken every month from April 17 to September 3. Evidently a common species.

_Pterostichus hyperboreus_ Mannerheim.

St. George, May 6 and June 10.

_Pterostichus similis_ Menetries.

Common on both islands. Records from St. George are June 4, 10, 14, 19, 25, July 4 and 16, August 4; from St. Paul, April 15 and “May to July”.

_Pterostichus quadricollis_ Menetries.

St. George and St. Paul, June. Less abundant than _P. similis_.

_Pterostichus subcaudatus_ Mannerheim.

St. Paul and St. George, June. This is the first record for the Pribilof Islands.
Pterostichus empetricola Dejean.

St. George, June 4, 10, 25, July 4 and 16, August 4; St. Paul, May 17, 19, 22, 31, June, July 13, September 1 and 3; also Sea Lion Rock, June 29. Fairly abundant and seems variable in size.

Genus Amara Bonelli.

Amara brunniipennis Dejean.

St. Paul and St. George. Dates are shown for each month between April 17 and September 3. Specimens run from shining black to some with distinct metallic tinge and several are of the form with brown elytra. There is also a good deal of variation in the extent of punctuation of the prothoracic basal impressions. This insect belongs to the subgenus Curtonotus Stephens.

Amara glacialis Mannerheim.

Several specimens from St. Paul, without definite date. Belongs to the subgenus Bradytus Zimmermann.

Amara brunnea Gyllenhal.

Many examples from St. Paul, May, June, and July. Belongs in the subgenus Acrodon Zimmermann.

Family DYTISCIIDAE.

Genus Hydroporus Clairville.

Hydroporus sp. indet.

A few specimens are at hand from St. George (April 4 and September 3) and St. Paul (June 11). At present it is not feasible to attempt specific determination of this insect, which is a small black species 3.5 mm. long; it is evidently close to or identical with H. nigellus Mannerheim, which figures in our lists as a synonym of H. tartaricus Leconte.

Hydroporus sp. indet.

Three examples of a bicolored species, 5 mm. in length, come from St. George, dated June 10. They appear to be related to H. truncatus Mannerheim in size, color, and oblique truncation of the elytral apices, but differ from the description in some details.

Genus Agabus Leach.

Agabus sp. indet.

Three females from St. George, June, August, and September. The male is necessary for identification.

Family SILPHIDAE.

Genus Lyrosoma Mannerheim.

Lyrosoma opaca Mannerheim.

St. George, abundant; St. Paul, two specimens; taken every month from May 17 to September 6; Sealion Rock, June 29.
Family STAPHYLINIDAE.

Genus *Atheta* Thomson.

*Atheta* (Megista) *nomadica* Casey.

St. Paul, May 22 and July 4, many specimens. The determination is due to Dr. A. Fenyes who writes that it is probably correct. He has also given us the generic references for the two species following.

*Atheta* sp. indet.

St. Paul, May 22.

Genus *Ocyusa* Kraatz.

*Ocyusa* sp. indet.

St. George, May 4, one specimen in bad condition.

Genus *Liparocephalus* Määklín.

*Liparocephalus* brevipennis Määklín.

St. Paul, a pair, May 13; St. George, one specimen, September 2.

Genus *Quedius* Stephens.

*Quedius* hyperboreus Erichson.

St. Paul, May 22, one specimen.

*Quedius* moleschinus Gravenhorst.

One specimen, St. George, August 4.

Genus *Tachinus* Gravenhorst.

*Tachinus* apterus Määklín.

About sixty specimens of *Tachinus* belong to a species which runs close to *instabilis* Määklín by Dr. Horn's table. Some of the females, however, have the median dorsal lobe of the abdominal apex short, this being the character upon which *T. apterus* Määklín is based. Likely enough, the whole series might properly be referred to *T. apterus*, which was not known to Dr. Horn. Specimens occur on both Islands, and the dates cover April, May, June, July, and September.

Genus *Bryoporus* Kraatz.

*Bryoporus* near *insignis* Määklín.

A specimen of *Bryoporus* collected on St. Paul, May 22, may be compared with *Mycetoporus insignis* Määklín from the island of Afognak. The description seems to agree in most of the principal points but differs in regard to coloration. The St. Paul specimen is 5.5 mm. in length, very shining, piceous black, the elytra tending toward castaneous. The antennae are blackish, strongly thickened externally and as long as the head and prothorax together, the two basal joints yellowish, third a little darker. Legs pale testaceous, coxae darker, hind femora and trochanters infuscate. Hind margins of abdominal segments scarcely perceptibly lighter above, more distinctly
so beneath. The four punctures described by Mäklin as being placed slightly in front of the hind margin of the pronotum are very distinct, the lateral and apical series are small. Elytra sparsely and finely punctate on the disk, a little more closely toward the scutellum, in addition to showing the usual sutural, discal, and lateral series of larger punctures. I do not make out any sexual characters. *Mycestroporus* and *Bryoporos* are separated by slender characters and have been united by Fauvel. It is entirely probable that the species in hand is congeneric with that of Mäklin though perhaps not con-specific.

**Genus Deliphrum** Erichson.

*Deliphrum* sp. indet.

About a dozen specimens, St. Paul and St. George, covering the months of April, May, June, August, and September. These belong to *Deliphrum* or some closely allied genus but the species can not be identified with any hitherto recorded from North America. Quite possibly it may be described from Siberia.

**Genus Olophrum** Erichson.

*Olophrum marginatum* Kirby.

St. George, May 6 and September 2.

*Olophrum fuscum* Gravenhorst.

St. George, June and September; St. Paul, May.

**Genus Micralymma** Westwood.

*Micralymma dicksoni* Mäklin.

St. George, April 12, June 4, 25, August 16, September 2; St. Paul, April 5. The identification of this very interesting beach-inhabiting insect is based upon comparison with specimens in the United States National Museum, having the above specific label in the handwriting of Mr. Schwarz.

**Family LATHRIDIIDAE**

**Genus Enicmus** Thomson.

*Enicmus protensicollis* Mannerheim.

St. Paul, one specimen. May 24.

**Family BYRRHIDAE**

**Genus Byrrhus** Linnaeus.

*Byrrhus fasciatus* Fabricius.

St. Paul, several specimens. The only dates given are May 23 and July 13. These specimens agree very closely with examples in the United States National Museum from Copper Island, carrying the above specific label.
Family ELATERIDAE.

Genus Cryptohypnus Eschscholtz.

Cryptohypnus littoralis Eschscholtz.
Several, from St. Paul. The dates given are April 30 to May 22, but most of the specimens are simply marked "Summer."

Genus Hypnoidus Stephens.

Hypnoidus musculus Eschscholtz.
St. Paul, four specimens. The only definite date is June 20. Common at various points on the Alaskan seacoast, occurring under shingle along the beaches.

Family PTINIDAE.

Genus Trigonogenius Solier.

Trigonogenius globulum Solier.
St. Paul, April; St. George, April 17. Widely distributed by commerce.

Genus Ptinus Linnaeus.

Ptinus fur Linnaeus.
St. Paul, January 6, May 16; St. George, May 17 and September 3. Common in houses over most of the civilized world.

Family CHRYSOMELIDAE.

Genus Chrysomela Linnaeus.

Chrysomela subsulcata Mannerheim.
The collection contains a beautiful and extensive series, varying in size, color, and depth of sculpture. Some specimens are green, others blue, while several are decidedly coppery. A few are blackish with very little luster. They come from both St. George and St. Paul and were mostly collected in May, June, and July, though the dates run as early as April 30 and as late as September 3. Several larvae of different sizes bear the date of May 14-22.

Family AEGIALITIDAE.

Genus Aegialites Mannerheim.

Aegialites californicus Motschulsky.
Numerous specimens from St. Paul, St. George, and Sea Lion Rock. The dates run between June 4 and July 8. Larvae were taken June 4 and June 29.
Family CURCULIONIDAE.

Genus *Lophalophus* Leconte.

*Lophalophus inquinatus* Mannerheim.
St. Paul, fairly common, May 19 to August 16.

Genus *Trachodes* Germar.

*Trachodes ptinoides* Germar.
St. George, May 6 to September 10.

Genus *Orchestes* Illiger.

*Orchestes parvicollis* Leconte.
Three specimens, St. Paul, spring of 1914.

A specimen of *Ilybius angustior* Gyllenhal was present in the stomach of a red phalarope, collected on St. George Island August 2, 1920, and one of *Hadrotes*, not specifically identified, in the stomach of a pectoral sandpiper collected on St. Paul Island August 22, 1914.

In addition to the beetles mentioned in the preceding list, E. A. Schwarz recorded (Report on Fur Seals and Fur Seal Islands, Pt. 3, pp. 548–549, 1899), partly on the basis of Wosnesenski's specimens as reported by Menetries, Motschulsky, and Mannerheim, the following species as inhabitants of the Pribilofs:

*Laccophilus decipiens* Le Conte. St. George.
*Berosus maculosus* Mannerheim. St. George.
*Hadrotes crassus* Mannerheim. St. George.


An easily overlooked paper recording 26 species of Coleoptera from the Aleutian Islands, but none specifically from the Pribilofs, is the following: Coinde, J. P., Notice sur le faune ornithologique de l’Île de Saint-Paul, suivie de l’enumeration de quelques especes d’insectes (Coleopteres) des Aléoutiennes et du Kamtschatka. Rev. et Mag. Zool., 2e Sér., T. XII, pp. 396–405, 1860.—W. L. M.
MECOPTERA.

By NATHAN BANKS, Museum of Comparative Zoology, Harvard University.

Pl. IX, fig. 8.

Family PANORPIDAE.

Boreus borealis, n. sp.

Brassy black; the legs, including coxae and the pleura, the lower half of the beak, the wings (except tip in the male), and the ovipositor (except tip), are yellowish; the extreme tips of tibia and tarsal joints black; male genitalia pale; face hairy, vertex shining; wings in male very long and slender, fully one-half as long as abdomen, tip curved downward and ending in two points, one more slender than the other; ventral plate of male truncate, not notched at tip; in the female wings reach to abdomen, about twice as long as broad, larger than in allied species; ovipositor one-half the length of the abdomen, basal part concave above, beyond straight, below hairy.

Length: Male, 3.8 mm.; female, with ovipositor, 5 mm.


See Plate IX, Figure 8, male genitalia from side and behind, and side view of wings and ovipositor.

EXPLANATION OF PLATE IX.

Details of Scorpion Fly (Mecoptera) and Mites (Arachnida, pp. 237–239).

Fig. 1. Dermacarus sp., venter and tarsus I—hypopus.
Fig. 2. Notaspis serrifrons, edge of head and top of cephalothorax.
Fig. 3. Hilaira glacialis, palpus of male.
Fig. 4. Lohmannia scabra, dorsum.
Fig. 5. Parasitus borealis, epitomae showing variation.
Fig. 6. Tyrolyphus whitneyi, venter and tarsus I—hypopus.
Fig. 7. Parasitus borealis, leg II of male.
Fig. 8. Boreus borealis (Mecoptera); above, male genitalia from side and behind; below, side view of wings and ovipositor.
DETAILS OF SCORPION FLY (MECOPTERA, FIG. 8) AND MITES (ARACHNIDA, FIGS. 1-7).

(Explanation on page 158.)
DIPTERA.

Suborder Orthorrhapha.

Division NEMATOCERA.

Families TIPULIDAE and RHYPHIDAE.

By CHARLES P. ALEXANDER, Department of Entomology, Massachusetts Agricultural College.

(Plates X and XI.)

Our knowledge of the crane flies of the Pribilof Islands is due largely to the collections made by G. Dallas Hanna on the island of St. George and by Alvin G. and Elsie G. Whitney on the island of St. Paul, previous collections yielding very fragmentary data. In E. A. Schwarz's list\(^1\) the following records for members of this family of flies occur:

Trichocera sp. A single specimen collected by Mr. Barrett-Hamilton. To this or an allied species I am inclined to refer the "gnat" mentioned by Mr. Elliott which "flits about in large swarms, but it is inoffensive and seeks shelter in the grass."

Tipulid. A single larva from Mr. Barrett-Hamilton's collection from St. Paul indicates a larger species than the Trichocera just mentioned.

The above material was determined by the late D. W. Coquillett; additional specimens that were collected by Mr. Elliott in 1895 were found among the undetermined material in the United States National Museum and will be found recorded under *Tipula whitneyi* on a later page.

The crane fly fauna of these islands is similar to that of many other wind-swept islands, in the large number of species with the wings so atrophied that the flies are incapable of flight. The relatively large number of species that seem to be confined to the Pribilofs is partly accounted for in this manner. The Alaskan Tipulidae named by Mr. Coquillett and now contained in the National Museum have been compared with the Pribilof material and were found to represent quite a different fauna, some comparisons to which are noted in later pages.

The notes of the collectors of the material are quoted under their original numbers.

NORTH AMERICAN FAUNA. [No. 46

Family RHYPHIDAE.

Genus Trichocera Meigen (1803).

Trichocera sp.

Numerous specimens of these crane-flies were included in the collection, but the systematic condition of the species of the genus is such that it is impossible to identify the insects at this time. St. George Island, June 14, 1914; St. Paul Island, Sept. 30, 1911. Mr. Whitney's note on his number 168 follows:

"Spring 1914. 12 gnats (?) flying in a swarm by the laboratory, St. Paul Island."

Family TIPULIDAE.

Subfamily LIMNOBIINAE.

Tribe Pediciini.

Genus Tricyphona Zetterstedt (1840).

Tricyphona hannai, n. sp.

Male, length about 7.7 mm.; wing, 5.8 mm.

Rostrum and palpi very short, dark brown. Antennae short, dark brown, first segment about half again as long as the second; flagellum short, of an indeterminable number of segments, the basal segments greatly enlarged, thence tapering to the apex; the terminal segments very small, more or less fused, and provided with long verticils; eyes small, hairy; head with the front and vertex broad, dark brown, with a grayish yellow pollen.

Pronotum prominent; thorax dark brown with a grayish-yellow pollen; halteres long, more or less flattened and twisted, the knob not prominent; wings considerably atrophied both in length and width, the venation considerably degenerated (see pl. 10, fig. 1); the color is light brown, the disk darker anteriorly; the costa is incrassated and provided with several ranks of stout hairlike bristles; R's elongated, straight, in a line with R_{4+5}, which is forked at the apex, R_4 and R_5 being separate at the wing-margin; R_{2+3} indistinct on its terminal portion; cross-vein r-m elongate, prominent; media with only the upper branch clearly defined, this branch apparently unforked; cubitus well developed, dark brown, well defined; two anal veins, the second very long and straight; some of the veins with strong hairs or hairlike bristles on them, a group of about five in the stigmal region, about six along R_{2+3}; a considerable series on the apical portion of R_{4+5} and on R_4 and R_5; about twelve on the upper branch of M, others on the forks of Cu, and about nine, evenly spaced, on the second anal vein.

Abdomen dark brown, with sparse long, yellow appressed hairs; caudal and lateral margins of the segments paler; hypopygium (see Pl. X, fig. 6) with the ninth tergite rather broad, the caudal margin
gently concave; pleurites very short and stout, the outer face with numerous pale hairs, the inner face with numerous black spicules; appendages two, the dorsal appendage a capitate lobe on a very short pedicel, the head with numerous black spicules and a few long yellow hairs; ventral appendage a flattened blade-like subchitinized arm; ninth sternite narrow, the caudal margin with the median portion straight but slightly denticulate at the ends.

Holotype, ♂, St. George Island, Bering Sea; June 10, 1914 (Hanna). "Lot-number 13. Found near a pool in Sphagnum bog, west of village."

There can be little doubt but that this insect is a degenerate species of *Tricyphona* with the fused portion of veins R<sub>4+5</sub> of the wings very extensive, and many details of the venation considerably atrophied or hypertrophied. The insect is named in honor of the collector, G. Dallas Hanna.

Subfamily Tipuliniae.

Tribe Tipulini.

*Genus Tipula* Linnaeus (1758).

*Tipula whitneyi*, n. sp.

Male, length 13–14 mm.; wing, 2.8–5.5 mm.

Female, length 19–22 mm.; wing, 2.5–3 mm.

Frontal prolongation of the head moderate in length, gray, nasus indistinct; palpi dark brown. Antennae dark brownish-black, the segments of the flagellum very slightly constricted beyond the enlarged base; the segments covered with a short, dense, gray pubescence. Head clear whitish gray with a distinct impressed median line.

Pronotal scutum light gray with a narrow median brown vitta. Mesonotal praescutum and scutum clear light gray without apparent darker markings of any kind; scutellum and postnotum brownish gray with a narrow brown median vitta; pleura brownish gray; halteres short, yellowish brown, the knob dark brown; legs with the coxae prominent, light gray, with numerous long pale hairs; trochanters reddish brown; femora and tibiae reddish brown, tipped with dark brown; tarsi dark brown to black; wings extremely reduced in both sexes, in some specimens a little longer than in others, one male having the right wing twice as long as the left wing; in most specimens the wings extend about to the tip of the first abdominal segment; wings light brown, the costal margin very greatly incrassated, the region immediately behind the costa with an abundance of short bristles; venation (see Pl. X, fig. 2) indistinct, distorted, but traceable.

Abdomen varying from brown to reddish brown, with a broad, dark brown dorso-median stripe; first tergite largely dark brown;
lateral margins of the sclerites broadly, caudal margins very narrowly, pale; sternites grayish brown; hypopygium (see Pl. X, fig. 7) with the ninth tergite (see Pl. XI; fig. 13) prominent, the caudal margin with a broad U-shaped median notch which is notched again by a smaller W-shaped incision; the lateral lobes are broadly truncated, with the caudal margin shiny, tumid; ninth pleurite large, complete, situated on the dorso-caudal face of the ninth sternite, the ventral inner angle clothed with numerous long pale yellow hairs; pleural appendages two, the outer appendage a slender, cylindrical fleshy lobe that is clothed with comparatively short hairs; inner pleural appendage large, prominent, compressed, projecting cephalad as a narrowed lobe which occupies the notch of the tergite; near the apex it is split into a smaller lobe which is deflected laterad; ninth sternite with a broad U-shaped notch on the caudal half; on the cephalic half the margins of each side are approximated but not contiguous, the median area membranaceous; eighth sternite with the caudal margin simple, unarmed.

The female is similar to the male but the dorso-median abdominal vitta is often interrupted on the basal third of each segment; the wings are still shorter, extending to just beyond the base of the first abdominal segment; valves of the ovipositor (see pl. 11, fig. 21) very long and slender, the tergal valves slightly divergent, enlarged basally, thence gradually narrowed to the tip; sternal valves shorter, compressed, the apices rather blunt.

Holotype, ♂, St. George Island, Bering Sea; June 12, 1914 (Hanna); lot 16. Allotype, ♀, topotypic; lot 27, June 16, 1914. Paratypes, 35 ♂'s, 9 ♀'s, as follows: 18 ♂'s, 8 ♀'s, topotypic, June 12 to July 8, 1914 (Hanna); lots 16, 17, 27, 30, 41, 46, 49, 52, and 55. 1 ♂, Otter Island, July 3, 1913 (Whitney); lot 60. 1 ♂, St. Paul Island, June 10, 1913 (Whitney); lot 40. 2 ♀'s with the last, June 1, 1914; lot 170. 1 ♂, bred from pupa, with the last, June, 1914; lot 186. 1 ♂, 1 ♀ (gravid), St. Paul Island, July 10, 1895 (H. W. Elliott). 1 ♂, with the last, July 12, 1895; U. S. Nat. Mus. Acc. No. 30147.

The accompanying collectors' notes with the above lot numbers are as follows:

Hanna: Lot 16. Found crawling over grass of high beach lands, not seen near bogs or on top of high hills; lot 30, toward East Rookery from village—none seen with wings developed; lot 41, uplands toward Staraya Artel Rookery; lot 46, from toward East Rookery; lot 49, toward Zapadni—damaged by cyanide; lot 52, from toward Zapadni Rookery.

Whitney: Lot 40. In grass, one at Kitovi and the other on Reef Peninsula; lot 60, Otter Island (6 miles from St. Paul).

This fly is named in honor of the collector of certain of the paratypes, Mr. Alvin G. Whitney.
The pupal skin from which one of the paratypes was bred was collected about June 1 and the adult fly emerged early in June. The following notes on the exuvium are included:

Length about 21.5 mm; diameter about 5 mm.; prothoracic breathing horns very short, finely crenulated; abdominal tergites with the caudal half of each segment bearing four blunt tubercles in alignment; the eighth segment with a fleshy tubercle on each side; ninth tergite (see Pl. XI, fig. 23) with the caudal margin deeply concave; the lateral angles wrinkled; tergal valves very elongated, blunt at their apices; sternal valves shorter; caudal half of sternite five (see Pl. XI, fig. 24) with four subacute fleshy tubercles on each side of the median line; sixth sternite with three similar tubercles; seventh sternite with two similar tubercles; eighth sternite with six large tubercles; leg pads ending about at the base of abdominal segment four; wing pads ending just beyond the base of segment three.

**Tipula pribilofensis, n. sp.** PIs. X and XI.

*Male.*—Length 12.5-13.5 mm.; wing, 10.5-11.5 mm.; antennae about 5.5 mm.

*Female.*—Length, 15.5-19 mm.; wing, 10-11 mm.

Frontal prolongation of the head rather short, dark brown, with a dark gray bloom; nasus distinct; palpi short, dark brown; antennae rather elongated, black, the flagellar segments beyond the first deeply constricted at their middle; head dark with a dense, dark gray bloom.

Pronotal scutum gray, the scutellum yellowish on the lateral margins, this color becoming confluent with the same color of the dorso-pleural membranes; mesonotum gray, stripes not indicated; sides of the scutellum and postnotum more yellowish; pleura brownish gray; halteres rather short, dull yellow, the knobs more brownish; legs with the coxae gray, trochanters, femora and tibiae brown, the two latter a little darkened at their apices; tarsi black; wings semi-atrophied, the length little reduced but the width considerably restricted so that the venation is much distorted; color of the wings pale brownish, the stigma distinct, pale brown, not encroaching into the base of cell R₂; veins brown; venation as in Plate 10, Figure 3.

Abdominal tergites reddish yellow with three indistinct interrupted brown lines, the lateral stripes becoming distinct only on the apical segments where they suffuse the entire bases of the sclerites; ninth tergite black; tergites with conspicuous transverse punctured areas on the basal half of each segment, these areas interrupted on the mid-dorsal line; hypopygium (see Pl. X, fig. 8) with the ninth tergite (see Pl. XI, fig. 14) extensive, the caudal margin with a very broad V-shaped notch, the lateral angles prolonged caudad as shiny impunctate horns; pleural appendages two; the outer appendage a conspicuous elongated fleshy lobe, narrowed at
the base, thence very slightly expanded and tapering gradually to the blunt apex; it is clothed with abundant hairs, on the caudal face very long, divergent, on the cephalic and lateral faces short, more appressed; inner pleural appendage a complex, flattened, chitinized lobe divided into two lobules, the ventral or caudal lobule projecting caudad as a compressed blade that is blunt at the apex, the outer face with about eight short bristles, the inner face with several long pale hairs; the inner or dorsal lobule jutting into the notch of the ninth tergite, flattened, compressed, with indistinct parallel grooves; the sterno-pleural suture is indistinct; at the point where it is usually located a short, slender, fleshy setigerous lobe; eighth sternite (see pl. 11, fig. 19) produced caudad as a very flattened, depressed, median arm that is shaped like a spade; the apex is gently notched medially by a broad U-shaped incision; the caudal margin of this tongue is fringed with delicate pale hairs.

The female is similar to the male; the antennal segments simple throughout; abdominal tergites dark gray, the caudal margins of the segments brighter, more yellowish; ovipositor (see Pl. XI, fig. 20) with the last tergite extremely elongated, smooth, shiny black; chitinized; tergal valves of the ovipositor triangular, lying both transversely and vertically, short, acutely pointed from very broad bases, the apices divergent; the dorsal face smooth, light chestnut brown; the outer face with a prominent median carina running from the base to the apex, the remaining surface of this face with a roughened irregular meshwork of raised lines; the ridges between the three faces of the valves with numerous fimbriate hairs; sternal valves reduced to tiny lobes.

Holotype, ♀, St. Paul Island, June 1, 1914 (Whitney); lot 170. "No 170. About June 1, 1914. Tolstoi sand dunes. Crane flies were crawling everywhere at this time and many were mating. Allotype, ♂, totopotypic. Paratypes, 20 ♂'s, 3 ♀'s, totopotypic.

Tipula aleutica, n. sp. Pls. X and XI.

Male.—Length about 13-14 mm; wing, 13.5 mm. Discolored by cyanide.

Frontal prolongation of the head dark brown, short and stout; nasus indistinct; antennae dark brown, rather short, the segments not constricted; head dark grayish brown with abundant long pale hairs.

Pronotal scutum grayish brown with abundant long pale hairs; mesonotal praescutum gray with blue-gray stripes, these latter indistinctly margined with darker; the median stripe broadest at the cephalic end, narrowed at the suture, these stripes appearing to be discolored, probably by the action of cyanide; scutum gray, the lobes blue-gray; pleura dull gray; halteres short, pale yellowish
throughout; legs with the coxae dull gray densely covered with long pale hairs; trochanters brown; femora and tibia light brownish yellow, the apices slightly darkened; tarsi dark brown; wings with a very faint brownish tinge, the stigma brown; veins dark brown; venation as in Plate 10, Figure 4.

Abdomen brownish gray, the caudal margins of the segments ringed with paler; hypopygium (see Pl. X, fig. 9) with the ninth tergite (see Pl. XI, fig. 15) moderately prominent, the caudal margin straight across, with two lobes, one on either side of the median line; these lobes pale yellow, conical, their apices rather acute, the notch between them narrowly V-shaped; ninth sterno-pleurite prominent, the pleural region partially separated from the sternite by a conspicuous arcuated suture beneath; pleural appendages two, situated far out near the apex of the sterno-pleurite, the outer appendage pale, prominent, flattened, a little narrowed toward the blunt apex; inner appendage of a very simple structure, a pale slightly chitinized lobe whose anterior angle is produced cephalad as a long subacute lobule, on the outer face near the caudal margin, a slender, acutely pointed horn directed cephalad; ninth sternite profoundly incised by a very narrow V-shaped notch, the adjacent margins pale-pubescent, not approximated; eighth sternite narrow, the caudal margin straight across, unarmed.

Holotype, $, St. George Island, June 27, 1914 (Hanna). "Lot 49. Toward Zapadni."

This crane fly belongs to the group of perlongipes Johnson, sulphurea Doane, tenebrosa Coquillett, and kennicotti Alexander. The only species with which it requires comparison are cimmeria Speiser, and tenebrosa Coquillett, and this comparison is given herewith, the notes and figures being based upon the types in the United States National Museum.

Tipula cimmeria Speiser (Dem Kilimandjaro, dem Meru Expedition, 10, Diptera. 4, Orthorhapha. Nematocera, p. 57, 1909) is the correct name for Tipula strigata Coquillett. Type number 5205, U. S. National Museum, from Yakutat, Alaska, June 21, 1899, collected by Kincaid.

The type of strigata is a male; antennae rather short, scape dull yellow, flagellum, dark brown, the segments a little constricted beyond the base: Frontal prolongation of the head short, nasus very prominent; Wing-venation with the basal deflection of $R_{4+5}$, $r-m$ and the basal deflection of $M_{1+2}$ almost in a line. Hypopygium with the tergite, pleurite and sternite fused in an almost continuous ring, the pleural suture well-indicated beneath; the tergo-pleural notch small, on the caudal margin only; ninth tergite (see Pl. XI, fig. 16) subquadrate, dark brown, with the caudal margin transversely truncated and bearing a pair of median lobes (as in the
tephrocephala group); these lobes pale, darkened at their apices, very closely approximated on the basal three-quarters, the tips more separated, the apices of the lobes minutely spiculose; the length of these lobes is about the same as the length of the tergite; they are fringed on their outer lateral margin with long hairs; ninth pleur- ite with the suture conspicuous beneath, broadly U-shaped; the ventrocaudal angle with a tuft of long hairs which are decussate on the median line beneath; outer pleural appendage (see Pl. X, fig. 12) large, prominent, pale, fleshy, very flattened, elongate, slightly constricted beyond the base, then expanded, the apex a little pointed; the outer face with scanty strigose yellow hairs; inner pleural appendage very large, powerful, bilobed, the outer or caudal lobe short, subrotund, the apex a little truncated, densely and finely pale strigose on the inner face; inner lobe flattened, compressed; ninth sternite deeply divided, at the caudal angle just behind the suture with a sparse tuft of long pale hairs, decussate on the median line beneath; near the base of the split a dense tuft of golden yellow hair; eighth sternite prominent, straight across the caudal margin, unarm ed with any brush or tuft.

Tipula tenebrosa Coquillett was described from Berg Bay, Alaska; collected June 10, 1899, by Kincaid; type number 5206, U. S. National Museum. The type is a male; the hypopygium has the ninth tergite (see Pl. XI, fig. 17) large, convex, the caudal margin with a prominent stout lobe on either side of the median line, these separated by a space equal to about one-half the diameter of the lobe; the apices of these lobes blackened, minutely spiculose; caudal margin of the tergite sloping obliquely backward from these lobes; notch between the ninth tergite and the ninth pleurite quite deep, but not running back to the eighth segment; ninth pleurite incomplete, the pleural suture well indicated beneath; the pleural region produced caudad as a blunt triangular arm bearing the appendages out near its apex; outer pleural appendage (see Pl. X, fig. 11) flattened, subquadrate or slightly elongated, bearing at the base on the inside the inner pleural appendage which is flattened, bilobed, the caudal lobe a short, blackened, chitinized point; the caudal face of the lobe on the basal half is downy pubescent; ninth sternite deeply cleft on the median line beneath but the adjoining sides contiguous; eighth sternite prominent, the caudal margin unarm ed. Coquillett’s description of the hypopygium does not agree at all with the type; the outer pleural appendages are described as being nearly twice as long as wide, the lower outer angle considerably prolonged beyond the upper one; this agrees much better with the somewhat similar Tipula cimmeria, discussed above.
Tipula alascaensis, n. sp.

Male.—Length, 11–13.5 mm.; wing, 14.5–15 mm.
Female.—Length, 15–18 mm.; wing, 17.5 mm.

Frontal prolongation of the head bluish gray, very short, nasus indistinct; palpi gray, short; antennae very short, black, with a sparse grayish bloom; first segment elongated, longer than the second and third together; the flagellar segments very short, slightly constricted beyond the basal swelling; head blue-gray with abundant long hairs, especially a tuft on the genae.

Mesonotum dark gray with rather indistinct stripes, the median vitta very broad, rapidly narrowed behind; lateral stripes narrow, beginning behind the conspicuous pseudosutural foveae; thoracic interspaces with short pale, erect hair; scutum and lateral portions of the postnotum with abundant erect black hairs; pleura dark gray, smooth, a large setigerous area on the mesepisternum behind the fore coxae; halteres short, brown, the knobs a little brighter; legs with the coxae gray, clothed with abundant long yellow hairs; femora yellowish brown tipped with dark brown; tibiae brown tipped with darker brown; tarsi dark brown; wings fully developed in both sexes, strongly tinged with brownish yellow, the costal cell not different in color from the other cells of the wing; stigma conspicuous, oval, dark brown; small areas before the stigma in cell 1st $R_1$ and beyond the stigma in cell 2d $R_1$, and the base of $R_2$ slightly paler; veins dark brown; venation as in Plate X, Figure 5.

Abdomen dark gray, the segments narrowly ringed with pale yellowish around the caudal margin; hypopygium (see Pl. X, fig. 10) very inconspicuous and somewhat concealed; ninth tergite (see Pl. XI, fig. 18) rather prominent, the caudal margin rounded, with a deep, narrow median notch; the lateral lobes are thus very broad and somewhat obliquely truncated; dorsal surface of the sclerite densely hairy; ninth pleurite small, complete, situated on the dorso-caudal face of the ninth sternite; outer pleural appendage short, clavate, slightly enlarged at the base, the head rounded, clothed with abundant golden hairs; inner pleural appendage compressed, flattened, on the outer face clothed with short, appressed golden hairs; ninth sternite prominent, with a very deep median notch whose margins are widely separated.

The female is generally similar to the male; the ovipositor has the last two segments exceedingly narrowed as in besselsi Osten Sacken and pilicops Alexander; the tergal valves (see Pl. XI, fig. 22) acute but small, tapering gradually from the broad base, the apices divergent.
Holotype, male, St. George Island, June 14, 1914 (Hanna), Lot number 17. Allotype, female, topotypic. Paratypes, 2 males, 3 females, topotypic; 2 females, topotypic on June 16, 1914 (Lot 27). “Lot number 17. In wet places, mostly, but some seen crawling over grass far from water. None seen flying. Those with wings best developed (the present species) from Spring Creek, Garden Cove. One seen with the very fuzzy fly in No. 18 (Scatophaga) beneath it; apparently both were fighting.” “Lot number 27. Garden Cove. Mrs. E. G. Whitney.”

Tipula, sp.

Abundant larvae of an unknown species of Tipula taken on St. Paul island July 18–20, 1913. Mr. Whitney’s notes on the species are very interesting:

No. 77. July 18, 1913. Reef Parade Ground. 12 larvae. Abundant everywhere there around the roots of grasses, herbs, and especially under beds of moss on the roots of which it feeds, killing the moss over considerable areas. Under such a moss bed I found as many as 20 to the square foot. This larva is found all over the island in grassy or mossy places and all through the summer season. It must be of considerable ecological importance because of its food value to the birds and foxes. The foxes will dig over large areas of moss beds to feed on these larvae. Was unable to find the species in adult form. Could not seem to raise adults in laboratory by keeping larvae with one of the food plants. It may possibly be the larval form of the crane fly, which is very abundant. Color not altered by pickling in alcohol.

The identity of the form with any of the adult flies known from the Pribilofs is very doubtful. The large size of the larvae in mid-July would imply a species that emerges at or near the very end of the growing season, and it seems possible that they belong to such a species, as yet unknown.

The fully grown larva measures 29–30 mm. in length and about 5 mm. in diameter; the form is plump, color light brownish yellow without conspicuous darker markings; hairs and setae sparse; the dorsa of the thoracic segments with hairs as in Plate 11, Figure 25; the abdominal segments have six bristles in alignment, the intermediate four being almost evenly spaced, the outer one being much the strongest; the fifth and sixth again are weak and situated close to the strong bristles (see Pl. XI, fig. 26). The stigmal field is surrounded by six weak teeth, the dorsal pair closely approximated, the lateral pair being latero-dorsal in position; the ventral pair very broad, the inner face with a broad-triangular black chitinized area. Stigmata large, separated by a distance about equal to the diameter of one stigma, located ventrad of the four dorsal-lying teeth that surround the stigmal field; gills fleshy, not prominent. (See Pl. XI, figs. 27, 28.)

Triopyhona glacialis Alexander, and Tipula pribilovia Alexander have previously been recorded by this author. (Proc. Calif. Acad. Sci., Fourth Ser. 11, pp. 183–184, Nov., 1921.)—W. L. M.
DETAILS OF CRANE FLIES (TIPULIDAE).

(Explanation on page 160.)
DETAILS OF CRANE FLIES (TIPULIDAE).
(Explanation on page 169.)
EXPLANATION OF PLATES X AND XI.

Plate X.—Details of Crane Flies (Tipulidae).

Fig. 1. Wing of Tricyphona hannai, sp. n.
Fig. 2. Wing of Tipula whitneyi, sp. n.
Fig. 3. Wing of Tipula pribilofensis, sp. n.
Fig. 4. Wing of Tipula aleutica, sp. n.; R_1, R_2, R_3 = Radial veins; M_1, M_2, M_4 = Medial veins; Cu_1, Cu_2 = Cubital veins; 2d A = Second anal vein.
Fig. 5. Wing of Tipula alascaensis, sp. n.
Fig. 6. Hypopygium of Tricyphona hannai; dorsal aspect; pZ = Ninth pleurite; d = Dorsal appendage; v = Ventral appendage.
Fig. 7. Hypopygium of Tipula whitneyi; lateral aspect; 8t, 9t = Eighth and ninth tergites; 8s = Eighth sternite.
Fig. 8. Hypopygium of Tipula pribilofensis; lateral aspect; lettering as in figs. 7 and 8.
Fig. 9. Hypopygium of Tipula aleutica; lateral aspect; lettering as in figs. 7 and 8.
Fig. 10. Hypopygium of Tipula alascaensis; lateral aspect; lettering as in figs. 7 and 8.
Fig. 11. Outer pleural appendage of Tipula tenebrosa Coquillett, lateral aspect.
Fig. 12. Outer pleural appendage of Tipula cimmeria Speiser; lateral aspect.

Plate XI.—Details of Crane Flies (Tipulidae).

Fig. 13. Ninth tergite of Tipula whitneyi; dorsal aspect.
Fig. 14. Ninth tergite of Tipula pribilofensis; dorsal aspect.
Fig. 15. Ninth tergite of Tipula aleutica; dorsal aspect.
Fig. 16. Ninth tergite of Tipula cimmeria; dorsal aspect.
Fig. 17. Ninth tergite of Tipula tenebrosa; dorsal aspect.
Fig. 18. Ninth tergite of Tipula alascaensis; dorsal aspect.
Fig. 19. Eighth sternite of Tipula pribilofensis; ventral aspect of the median lobe.
Fig. 20. Ovipositor of Tipula pribilofensis; dorsal aspect.
Fig. 21. Ovipositor of Tipula whitneyi; dorsal aspect.
Fig. 22. Ovipositor of Tipula alascaensis; dorsal aspect.
Fig. 23. Pupa of Tipula whitneyi; end of the abdomen, dorsal aspect; 8, 9 = Eighth and ninth segments.
Fig. 24. Pupa of Tipula whitneyi; end of the abdomen, ventral aspect; 5, 6, 7 = Fifth, sixth, and seventh segments.
Fig. 25. Larva of Tipula sp.; second thoracic segment, dorsal aspect, showing the distribution of the setae.
Fig. 26. Larva of Tipula sp.; fifth abdominal segment, dorsal aspect, showing the distribution of the setae.
Fig. 27. Larva of Tipula sp.; stigmal field, caudal aspect.
Fig. 28. Larva of Tipula sp.; stigmal field, dorso-caudal aspect.
DIPTERA.

(Except TIPULIDAE, RHYPHIDAE, and CALLIPHORIDAE.)

By J. R. Malloch, Assistant Biologist, Bureau of Biological Survey.

(Plates XII-XV.)

The present collection contains a very large number of specimens but is not particularly rich in species. Moreover, there is nothing very remarkable in the material, the only genus that has not previously been recorded from Alaska being Smittia, a genus of Chironomidae described from the Arctic regions of Europe (Spitzbergen).

I have taken the opportunity of indicating in the introductory notes to each family what the known larval habits of the species are, considering that this information may have a certain value in a list of this nature even though it does not refer directly to the species in the list.

The arrangement is that of the Aldrich Catalogue, but there are several changes in generic names.

Suborder Orthorrhapha.

Division NEMATOCERA.

Family CHIRONOMIDAE.

The larvae of most of the members of this family are aquatic in habit and those in the present collection are representatives of that section, belonging entirely to the subfamily Chironominae, though it is not improbable that some of them may be terrestrial as is the case with Camptocladius byssinus and some others. All of them except Smittia may be located generically by the use of the keys in my paper on Illinois Chironomidae subsequently cited. I have made figures of the male genitalia of the species described herein to prevent any misconceptions by future workers on the group as to their identity.

Genus Chironomus Meigen.

There is a striking similarity in the species of Chironomus in the collection. All are black, have the basal joint of the fore tarsi very little longer than the fore tibiae, and the males of all have the fore tarsi with long, soft hairs. Fortunately, the hypopygia of the males present in their structure good characters for differentiation of the species.
Synopsis of species.


2. Hypopygium with the superior processes indistinguishable, the inferior pair very small, apex of lateral arm obtusely truncate (Pl. XIII, fig. 6) .......................... obtusilobus.

Hypopygium with superior and inferior processes present, the latter well developed, apex of lateral arm pointed or rounded .......................... 3.

3. Superior process of hypopygium small, obtuse, a distinct fasciculus of hairs above it under the dorsal plate, the apical process of the latter stout, apex of lateral arm rounded (Pl. XIII, fig. 16) .......................... deviatus.

Superior process of hypopygium large, sickle-shaped, no fasciculus above it, apical process of dorsal plate slender, apex of lateral arm pointed (Pl. XIII, fig. 13) .......................... conformis.

4. Small species 3-4 mm. in length; mesonotum with a conspicuous pale spot on anterior lateral angles .......................... deviatus.

Larger species 5-7 mm. in length; thorax black .......................... 5.

5. Wings brownish, veins very distinct; posterior branch of radius arcuate at tip .......................... conformis.

Wings whitish, veins indistinct; posterior branch of radius straight or very slightly arcuate .......................... obtusilobus.

The males of all three species run down to caption 11 in my key to Group B, Subsection I of Chironomus.² The structure of the hypopygium readily separates them from the species therein included except in the case of conformis which has the hypopygium similar to that of quadripunctatus; the latter, however, has yellow legs.

Chironomus obtusilobus, n. sp.


Hypopygium as in Plate XIII, Figure 6, the lateral arms rather stouter than normal. Fore tarsi with long hairs, basal joint slightly longer than tibiae (120:113), second joint not greatly longer than third (35:30). Radius almost entirely straight, ending as far before apex of wing as media does behind it.

Female.—Agrees with the male in color. Fore tarsi without long hairs; legs stouter than in male.

Length, 7—8.5 mm.

Type locality.—St. George Island, June 17, 1914 (G. D. Hanna, lot 40), 4 males caught on the wing among bog plants, border of Gull Lake, beside Staraya Artel Rookery. Paratypes from St. Paul Island, 9 specimens, July 22, 1913, Big Lake (A. G. Whitney, lot 92), “collected from our coats as they swarmed past us while driving along the lake”; 18 specimens, same date and place (A. G. Whitney,

lot 91), "swarms of these insects were driven by the breeze south-eastward off of the lake. These clouds of gnats noticeable throughout July and August."

Chironomus deviatus, n. sp.

**Male.**—Black, shining, without pruinescence on thorax. Meso-notum slightly yellowish on anterior lateral angles. Legs fuscous, tibiae and tarsi paler. Wings whitish, veins pale, cross vein not infuscated, a black longitudinal streak on base of wing as in *Cam-

optocladius*. Halteres testaceous. Antennal plumes and hairs on body and legs fuscous.

Hypopygium as in Plate XIII, Figure 16; the fasciculus of hairs below dorsal plate is more characteristic of the hypopygia of *Tany-
tarsus* than of *Chironomus* but the wings are not hairy. Basal joint of fore tarsi slightly longer than tibia (50:42), second joint distinctly longer than third (29:21); fore tarsi and mid and hind legs with long hairs. Wings narrow; radius ending appreciably farther in front of apex of wing than does media behind it.

**Female.**—Differs from the male in having the anterior lateral margins of the thorax with a conspicuous yellow or greenish spot, the legs much paler, and the base of the wings noticeably yellowish. Fore tarsi without long hairs.

Length, 3.25-4.5 mm.

**Type locality.**—St. Paul Island, Laboratory (A. G. Whitney, lot 39), 3 males and 1 female. "From a great many on window; probably hatched from native Sagina sod transplanted to laboratory a few days before."

The specimens taken on this occasion did not represent a single species, as a male of an *Orthocladius* bears the same lot number. I regret that more specimens were not taken, as it is not improbable that there were more than 2 species present.

Chironomus conformis, n. sp.

**Male.**—Deep black, opaque. Antennal plumes fuscous; thorax with slight indications of 3 longitudinal grayish pruinescent lines; abdomen with faint brownish posterior margins to segments; legs fuscous, tibiae and tarsi yellowish; wings slightly brownish, veins distinct, cross vein darkened; halteres yellowish brown; hairs on body black, on legs brownish.

Hypopygium similar to that of *decorus* Johannsen, the superior process and apical portion of lateral arm as in Plate XIII, Figure 13. Basal joint of fore tarsi very little longer than fore tibia (82 : 78), second joint very much longer than third (52 : 30); fore tarsi and mid and hind legs with very long and rather dense hairs. Radius slightly arcuate apically, ending as far before apex of wing as does media behind it.
Female—Agrees in color with male. Fore tarsi without long hairs; basal joint about as long as fore tibia.

Length, 8-9 mm.

Type locality.—St. Paul Island, August 16, 1914 (E. A. Preble), 2 males, 1 female; paratypes, 1 male, 1 female, same island, June 5, 1913 (A. G. Whitney, lot 37), laboratory. I have before me a paratype from Admiralty Bay, Alaska, June 27, belonging to the Philadelphia Academy of Natural Sciences. I had purposed describing the species from this specimen but take the present opportunity of doing so in company with this additional material and make the Admiralty Bay specimen a paratype.

Genus Tanytarsus Van der Wulp.

There is one species of this genus amongst the present material, similatus, which was originally described by the present writer, in the paper cited under the previous genus, from material obtained at Madison, Wisconsin. The species described on a previous page as Chironomus deviatus has the hypopygal characters of Tanytarsus, but I can not detect any surface hairs on the wings and pending the receipt of better specimens I leave it in Chironomus, although inclined to consider it as possibly belonging to the present genus.

Tanytarsus similatus Malloch.


In my original description of this species I stated that the hypopygium was similar to that of viridiventris, differing in the structure of the superior and inferior processes. The dorsal plate of my specimen appeared to have the apical extension broken off and I did not figure it. In the example before me I find that the dorsal plate is the same as in the type and presents an added character for distinguishing the species. (Pl. XIII, fig. 11.)

Locality, St. Paul Island, 1 male and 2 females, July 22, 1913 (A. G. Whitney, lot 93); Big Lake, "Collected at same time as larger ones [Chironomus conformis] from lake shore."

Genus Orthocladius Van der Wulp.

Most of the specimens of this family in the present collection belong to the genus Orthocladius. A few of the examples are in fairly good condition and are identifiable, but the greater portion are poorly preserved and in that condition are impossible of identification, or at least are not in condition that warrants my giving a specific name to them, because of the very large number of extremely closely allied forms occurring in the genus and the liability to error. It is possible for me to identify the following species.
Orthocladius obtubrattis Johannsen.

Orthocladius obtubrattis Johannsen, Bull. 86, New York State Museum, p. 281, 1905.

This species is represented by a large number of specimens in the collection. Johannsen described the species from examples obtained at Ithaca, N. Y., and Douglas, Alaska. A comparison of the hypopygia of an Ithaca specimen sent me by Prof. Johannsen and one of those from St. George Island shows that they are the same species. I give herewith (Pl. XIII, fig. 10) a figure of the apical prolongation of the dorsal plate of the hypopygium; in nivoriundus and most allied species this plate is without conspicuous hairs.

The data on specimens in collection is as follows: St. George Island, 35 specimens June 17, 1914 (lot 37, G. D. Hanna).

Orthocladius nivoriundus Fitch.


Not so numerously represented as the foregoing.

St. George Island:

1 specimen, June 5, 1913 (lot 30, A. G. Whitney).
1 specimen, June 10, 1914 (lot 11, G. D. Hanna).
8 specimens, June 17, 1914 (lot 37, G. D. Hanna).

Orthocladius sp. I.

A male specimen in rather poor condition has the hypopygium differing from that of nivoriundus in having no distinct extension of the dorsal plate. This may be the result of an accident as the normal extension is easily broken.

St. George Island: 1 specimen June 17, 1914 (lot 37, G. D. Hanna).

Orthocladius sp. II.

A male specimen lacking front tarsi and otherwise in poor condition has the hypopygium very different from that of nivoriundus. Undoubtedly the example belongs to a distinct species that is probably undescribed.

The extension of the dorsal plate is very long and slender, and the apical shoe-shaped portion of the lateral arm is much stouter than in any species known to me.

St. George Island: 1 specimen, June 14, 1914 (lot 23, G. D. Hanna).

Orthocladius sp. III.

A male specimen lacking the apical portion of the abdomen represents a species unknown to me. Differs from the 4 species already mentioned in having the scutellum yellow apically. The fore tarsi are bare, and very long, the basal joint being four-fifths as long as the tibia.

St. George Island: June 5, 1913 (lot 39, A. G. Whitney).
Orthocladius sp. IV.

Two males of a small species in poor condition. The species resembles *Trichocladius infuscatus* Malloch, but the legs are slightly yellowish.

St. George Island: June 17, 1914 (lot 37, G. D. Hanna).

Genus *Smittia* Holmgren.

The genus *Smittia* has not previously been recorded from America, the only described species having been taken on the islands of Nova Zembla (*longipennis*) and Spitzbergen (*brevipennis*) in the Arctic regions of the Old World. Although the original description of the genus is not very full I have no hesitation in placing the present species in *Smittia*. It is possible, though not at all probable, that the Alaskan species is the same as that described from Spitzbergen, but I am not able to find in the description of the latter confirmation that is necessary to permit me arriving at a decision that they are identical. I am therefore describing the present species as new. I have also taken this opportunity of redescribing the genus and indicating its true position in the Chironominae.

**Description of Genus.**

**Male.**—Antenna apparently 10-jointed (2+8), basal and apical flagellar joints elongated, joints 5, 6, and 7 not separated on their entire circumference (Pl. XIII, fig. 7), flagellar hair very short, the longest not exceeding the apical joint in length; palpi 4-jointed, base slightly tuberculate, basal joint about as broad as long and half as long as second, joints 2, 3, and 4 subequal; fore tarsi with the basal joint shorter than fore tibia; hypopygium as in *Orthocladius* (sens. lat.) and *Camptocladius*, the apical portions of lateral arm recurved (fig. 5), venation as in *Orthocladius*.

**Female.**—Differs from the male in having the antenna (Pl. XIII, fig. 8) 7-jointed (2+5).

Keiffer has indicated that Orthocladiariae may be separated from the group which contains *Chironomus* by the nature of the armature of the apex of the hind tibia. In *Orthocladius* there is a distinct spur, while in *Chironomus* and allied genera there is a comblike series of setulae. In the present species the hind tibial characters and also those of the hypopygium are those of the *Orthocladius* group. The genus as a more specialized form should be placed after that genus in our lists.

*Smittia arctica*, n. sp.

**Male and female.**—Black, opaque. Halteres obscurely yellowish. Legs piceous. Wings whitish, veins yellow.

**Male.**—Antennal sensory organs pale, hairlike (Pl. XIII, fig. 7); eyes bare. Pronotum linear, very slightly notched centrally; meso-
notum with 3 longitudinal series of weak hairs on disc, the central series weakest. Abdomen 1.5 times as long as head and thorax combined; hypopygium as Plate XIII, Figure 5. Basal joint of fore tarsi slightly over half as long as tibia (26:47); legs with very short hairs; claws flattened at apices but without distinct apical incisions; empodium slender, as long as claw, distinctly fringed. Wings not extending to apex of fifth abdominal segment; costa extending to apex (Pl. XIII, fig. 12).

Female.—Antenna as in Plate XIII, Figure 8. Abdomen stout. Basal joint of fore tarsi distinctly over half as long as fore tibiae (15:25); claws acute at apices. Wing veins not so thick as in male. Length, 1.75-2.25 mm.

Type specimen.—St. Paul Island, May 23, 1914 (A. G. Whitney, lot 143).

Paratypes.—St. Paul Island, 6 males and 7 females, May 23, 1914, from outside of laboratory window (A. G. Whitney, lot 152); 1 female, May 17, 1913 (A. G. Whitney, lot 29); 1 female, July 9, 1913 (A. G. Whitney, lot 67); St. George Island, 2 females, June 16, 1914 (G. D. Hanna, lot 32), taken by sweeping toward East Rookery; and 1 female, June 17, 1914 (G. D. Hanna, lot 37), Staraya Artel Rookery.

The type and lot 67 are on slides, the others are mounted on card points.

In my paper on the Chironomidae of Illinois3 the genus Smittia runs down to Orthocladius (sens. lat.) and is readily separated from any of the subgenera therein contained by the very short wings and the number of antennal joints in both sexes.

Family MYCETOPHILIDAE.

The larvae of most of the species of this family feed upon fungi and decaying vegetable matter, some of them occurring in colonies under bark of dead trees or fence posts. The flies are usually difficult to collect except by sweeping amongst overhanging bushes or grasses or at lights, though at times they may be found in numbers on fungi or on the inner sides of windows of out-houses or buildings. There are only seven specimens of the family in the present collection, representing five genera. Unfortunately, a specific identification is not possible in two cases owing to the poor condition of the specimens.

Genus Macrocera Meigen.

There are 9 species of the genus Macrocera described from North America, none of which have been recorded from Alaska. The only

example of the genus in the present collection apparently belongs to an undescribed species.

**Macrocera beringensis, n. sp.**

_Male._—Glossy black-brown. Mouth parts and basal 2 antennal joints yellowish; antennal flagellum shining, black. Prothorax, pleural sutures, and scutellum yellowish, remainder of thorax glossy black-brown. Abdomen unicolorous black-brown. Legs testaceous, apices of mid and hind coxae, and the tarsi infuscated. Wings slightly grayish, a large fuscous spot over petiole of media; another between the branches of cubitus touching the posterior branch along its apical half and not extending to anterior branch; a similarly colored, slightly curved, fasciform spot between middle of wing and apex, the posterior extremity of which covers the apical half of anterior branch of cubitus and the anterior one extending to fork of radius; apical spot rather faint. Halteres testaceous, more or less tinged with brown.

Antenna not over 1 ½ times as long as entire body, flagellum rather thick and from fourth joint to apex distinctly hairy, basal flagellar joint about one-fourth longer than second and slightly longer than third; median ocellus as large as lateral; frons with a distinct median furrow. Hypopygium stout, apex of lateral arms each with a stout black thorn on inner angle. Legs long but not particularly slender; basal joint of fore tarsus two-thirds as long as fore tibia and slightly longer than the remaining tarsal joints combined. Petiole of media very short, about 3 times as long as its own diameter; costa extending almost to apex of wing; its last section about 4 times as long as its penultimate one—the one preceding fork of radius; disk of wings without distinct hairs, veins except the anal one with setulose hairs.

Length, 6 mm.

_Type._—St. Paul Island, Summer, 1914 (E. A. Preble).

**Genus Boletina** Staeger.

A single female specimen of a species of this genus is contained in the collection but is in such poor condition that its identity is uncertain. In most particulars it agrees with _beringensis_ Coquillett. It is an abnormal specimen in so far as its wing venation is concerned, one wing having the base of the anterior branch of media absent while the other has it present. As this character, the absence or presence of this portion of this vein, is used as a generic one, this departure in the present case is worth recording.

_Locality._—St. George Island, June 27, 1914 (G. D. Hanna, lot 49); toward Zapadni.
Boletina obesula Johannsen.


**Boletina sp.**

One male of an "undescribed species" recorded by Cole as "too poorly preserved for description" in the same paper as above, from St. Paul Island, June 21, 1920, G. D. Hanna (p. 170).

**Genus Rhymosia** Winnertz.

*Rhymosia* sp.

A female specimen in poor condition, minus legs and antennae.


**Genus Allodia** Winnertz.

*Allodia subelata*, n. sp.

*Male.*—Fuscous, opaque; flagellum and legs brown; wings grayish, veins brown; halteres testaceous yellow; hairs yellow, bristles blackish.

Antenna about one and one-third times as long as head and thorax together; frons with the normal soft decumbent hairs, scutellar bristles 4 in number; 3 bristles above base of fore coxa and about 6 at apex of each. Comparative lengths of fore tibia and fore metatarsus 28:23; hind tibial setulae very weak; spurs on mid and hind tibiae long and stout. Hypopygium as in plate 13, figure 9. Furcation of media distinctly beyond apex of cross vein, the latter barely more than half as long as petiole; furcation of cubitus directly below proximal end of cross vein, the angle very acute; anal vein indistinct, subcostal vein very short, ending in radius.

Length, 3 mm.

*Type.*—St. George Island, June 14, 1914 (G. D. Hanna, Lot. 23); Garden Cove.

This species is closely allied to *elata* Johannsen, differing in venation and hypopygial characters chiefly.

**Genus Exechia** Winnertz.

*Exechia casta* Johannsen.


One male and 2 females in collection evidently belong to this species. The data on specimens is as follows: St. George Island, June 16, 1914 (G. D. Hanna, Lot 32). Taken by sweeping, toward East Rookery. I have made a drawing of the male hypopygium.
INSECTS OF THE PRIBILOF ISLANDS.

(Pl. XIII, fig. 14) which shows some slight differences from that given by Johannsen.

Johannsen's specimens were obtained from the following localities: Black Rock Creek, Dubois (type), Dinwiddie Creek, Hunters Creek, Wyoming, in September.

Family SCIARIDAE.

The species of this family represented in the collection belong to the genus *Sciara*. The members of this genus are remarkably similar in general appearance and it is only by the use of characters of wing venation and of genitalia that they can be differentiated with anything like certainty in the adult stage. The larvae which I have examined likewise very closely resemble each other, and those I have found were invariably feeding upon decaying vegetable matter, manure, or in fungi. One species I have reared from fallen plums. I have recently described the larva of a species that is often found crawling on the surface of the ground in immense numbers in the form of a rope-like mass. A number of other species in the family are known to have the same habit. The imagines, exclusive of the Arctic forms, have been dealt with in an extensive paper by Prof. O. A. Johannsen.

Genus *Sciara* Meigen.

There are representatives of 3 species of this genus in the collection. One of these is, I am confident, identical with one described by Rubsaamen; one is evidently undescribed, while the third is in too poor condition to permit of its exact identity being ascertained.

*Sciara glacialis* Rubsaamen. Pl. XIII, fig. 3.


Hypopygium of male as in Pl. 13, fig. 3. This species is evidently common on St. George Island, as it is represented by 64 specimens in the collection, with data as follows:

3 specimens, June 10, 1914 (lot 11, G. D. Hanna).
3 specimens, June 14, 1914 (lot 23, G. D. Hanna).
32 specimens, June 16, 1914 (lot 32, G. D. Hanna).
1 specimen, June 16, 1914 (lot 36, G. D. Hanna).
22 specimens, June 17, 1914 (lot 37, G. D. Hanna).
3 specimens, June 24, 1914 (lot 46, G. D. Hanna).

Lots 32, 36, and 46 were obtained "toward East Rookery;" lot 11 from near beach at East Landing; lot 23 from Garden Cove; and lot 37 Staraya Artel Rookery.

Sciara unguicauda, n. sp.

Male.—Brownish black, thorax shining, abdomen opaque. Legs, especially the fore pair, yellowish brown. Wings clear, veins pale brown. Halteres rufotestaceous. Arms of hypopygium reddish.

Face slightly buccate; eyes hairy, disc of mesonotum with short and very sparse hairs. Hypopygium similar to that of *glacialis*, the apical portion of lateral arm stouter, and the terminal thorn very strong. First branch of radius ends distinctly short of furcation of media; costa extends half way from apex of radius to apex of anterior branch of media; petiole of media subequal in length to anterior branch of that vein, the branches not appreciably divergent apically; cross vein over midway from base of first branch of radius; media leaves radius distinctly proximad of midway from base to cross vein; furcation of cubitus slightly proximad of base of media.

Female.—Slightly paler in color than the male. Apical plate of genitalia nearly twice as long as wide, subequal in length to pre-apical, and distinctly longer than basal one.

Length, 3-4 mm.

Type.—St. George Island, July 8, 1914 (lot 55, G. D. Hanna). Allotype and paratypes, same data. Paratypes, July 4, 1914 (lot 52, G. D. Hanna); toward Zapadni Rookery. Seven specimens.

Sciara sp.

A single male specimen in rather poor condition differs from the other two in structure of the hypopygium (Pl. XIII, fig. 4). In the form of the apical portion of the hypopygium it approaches closely that of *varians* Johannsen, a species described from Lawrence, Kans.; Ithaca, N. Y.; and Moscow, Idaho. The wings are in very poor condition and the specimen is otherwise in such a state that I can not give a definite identification. The data connected with it is as follows:

St. George Island, July 8, 1914 (lot 55, G. D. Hanna).

Genus Neosciara Petty.

Neosciara sp.


Family BIBIONIDAE.

Genus *Dilophus* Meigen.

*Dilophus tibialis* Loew.

A single female, collected on St. Paul Island, June 24, 1916, by G. Dallas Hanna is referred to this species by W. L. McAtee, who notes that it differs from the typical form by absence of yellow on body; when males are available the species may prove to be new.

**DIVISION BRACHYCPERA.**

**Family LEPTIDAE.**

This family is represented in the present collection by a single species of the genus *Ptiolina*.

The larvae of the known species of the family are largely terrestrial, living in the soil in woods or in decaying tree stumps and feeding upon earthworms and larvae of insects. One genus, *Atherix*, is aquatic in the larval and pupal stages, living in flowing water. The genus *Ptiolina* occurs in the larval stage in Europe in woods, under moss or in the earth. I have taken the imagines only in very marshy spots at rather high altitudes.

**Genus Ptiolina Zetterstedt.**

This genus is separable from *Spania* by the structure of the third antennal joint as pointed out by Verrall. It is highly probable that all of our three North American species previously described belong to this genus instead of *Spania*. The latter occurs in the same situations as *Ptiolina* in Europe, but is much commoner.

*Ptiolina arctica*, n. sp.

**Male and female.**—Brownish black, slightly shining. Immature specimens yellowish brown. Wings clear or slightly grayish. Halteres brown or yellowish.

**Male.**—Eyes large, closely contiguous for a short distance; ocelli situated upon a distinct elevation; space above antennae subtriangular; eyes widely divergent posteriorly on sides of face; basal 2 antennal joints short, subequal, short-haired above, third joint missing; palpi broad, rather hairy. Thorax with rather short and sparse hairs, most noticeable on the anterior lateral and posterior portions; scutellum convex, rounded in outline, surface hairs of moderate length, not dense. Abdomen more conspicuously hairy than thorax; hypopygium chitinised, lateral arms stout, symmetrical, rounded apically, not hairy. Legs moderately stout, their surfaces with short hairs; mid and hind tibae with apical spurs. Venation normal; fork of third vein frequently evanescent at base; branches of media not fused at apex of discal cell; anal cell closed.

**Female.**—Agrees in color with the male.

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Eyes very widely separated; third antennal joint much longer than broad, its apex tapering; style terminal, as long as third joint. Apex of abdomen slightly tapering. Otherwise as male.

Length 7-8 mm.

Type locality.—St. George Island, August 4, 1914 (G. D. Hanna).

This species is larger than any of those previously described from North America. Coquillett has recorded Spania edeta Walker, from Alaska. This species is velvety black and has only a length of 4 mm. Neither of Loew’s species can be identical with the one here described, differing both in color and venation.

The specimens before me are in poor condition either having been wet or at one time in alcohol, and are much discolored. Some of them were evidently immature when captured. The thorax may be in well preserved examples more or less distinctly vittate as traces of vittae are visible in one or two of those in this collection. The venation is like that of most Leptidae, rather unstable.

The larva of this species has not been described. A vial numbered 14116, containing 2 larvae from the stomach of Plectrophenax nivalis townsendi, St. Paul Island, June 19, 1890, is before me and the specimens are, I believe, referable to this species. The description is as follows:

Length, 8-9 mm. White, cephalic parts dark castaneous. Body cylindrical, tapered on prothorax and mesothorax, and flattened on dorsal surface of apical segment. Head of the same general structure as that of Chrysopila, differing in having the labrum much broader, blunt at apex, the sides slightly tapered anteriorly, and the dorsum slightly ridged transversely on anterior half; antennae short and stout, not twice as long as thick, terminal joint very minute; between the antennae and the labrum there is on each side a large pale membranous area, the surface of which is granular; maxillae large, almost entirely pale and membranous, palpi much smaller than antennae; mandibles stout, slightly hooked at apex; posterior dorsal arcuate shield about 1½ times as long as broad, rounded posteriorly; internal cephalic rods extending to posterior margin of head. Thoracic and abdominal locomotor organs not easily distinguishable in specimens owing to condition, but evidently consisting of slightly raised transverse areas on venter, similar to those on Chrysopila, which are armed with very small, sharp toothlike elevations; apical segment slightly longer than its basal breadth, rounded from near middle, its apex with 2 small upwardly directed, slightly chitinized teeth, which are separated by a distance greater than the height of either tooth, dorsum with 6 longitudinal grooves or furrows which do not extend to apex, and give a ridged appearance to the segment; venter of apical segment with flat elevation extending from base to
near apex, its apical outline in the form of 2 rounded lobes, slightly cephalad of middle of this flat area is the anal opening which is very distinct, and oval in shape; between the apex of the above elevation and extreme apex of segment there is a slight but distinct incision parallel to apical margin of segment.

Family EMPIDIDAE.

The larvae of the great majority of the species in this family are terrestrial and feed upon vegetable matter in the soil or in rotten wood or upon larvae or other small animals. One species has been found in the larval and pupal stages in running water in New York State. The adult females are predaceous but many species are found in large numbers upon flowers of various plants. The two genera represented in the present collection are the largest in point of numbers in the family, and are the most widely distributed and common. Coquillett has described or recorded about 20 species of the genus Rhamphomyia and seven species of Empis from Alaska.

Genus Empis Linnaeus.

There are four species of this genus in the collection, all in rather poor condition and all represented by females only. With one exception the species in this collection are referable to the group that contains virgata Coquillett.

Coquillett recorded Empis virgata Coquillett from Alaska and pellucida, fumida, and infumata were described by him at the same time, all being referred to as resembling virgata and only the first being described fully, the others being briefly compared with it. I had 4 specimens before me that belong to the same group as pellucida; because of the rather meagre descriptions I was unable to satisfactorily identify the species. I was obliged, therefore, to borrow paratypes of Coquillett's species from the United States National Museum for comparison. I have drawn up a key to the species (females), which is presented herewith, using characters not mentioned in the original descriptions.

All of the species are black in color, the legs sometimes brownish in pellucida, the mesonotum either trivittate or quadriovittate, the vittae shining and the intervening spaces grayish pruinose; legs with very few weak spines, not feathered; halteres yellow. There is a very great similarity between the 5 species, and the synopsis now given embodies practically all the essential characters useful for their separation.

Key to species of virgata group.

1. Hind femora with several distinct bristles on antero-dorsal surface of apical third; tibial bristles strong, those on hind tibiae longer than the diameter of the tibia; notopleural bristles 5 in number, the anterior one weak, the posterior 4 strong, subequal in length and rather closely placed, the series in a straight line; third antennal joint tapering except on a short space at base; fork of third vein about twice as long as the section of costa preceding it. \textit{fumida} Coquillett.

Hind femora without distinct bristles on apical third of antero-dorsal surface, only the normal short hairs present; hind tibial bristles not longer than the tibial diameter; notopleural bristles rather weak, widely placed and usually 3 in number, fork of third vein not twice as long as section of costa preceding it. \textit{pellucida} Coquillett.

2. Fore coxa with very few widely placed hairs on anterior surface, seen from the side only about a dozen visible; hind femora and tibiae slender, the former almost nude on anterior surface; distance between apices of third vein and first branch of media distinctly greater than that between branches of media, measured along margin of wing, because of a distinct deflection of the first branch of media just below fork of third. \textit{pellucida} Coquillett.

Fore coxae with numerous rather long, soft hairs anteriorly. \textit{pellucida} Coquillett.

3. Thorax trivittate, the vittae shining, the spaces between gray pruinose; wings slightly infuscated at apices. \textit{virgata} Coquillett.

Thorax quadrivittate, occasionally the vittae are not very distinct; wings evenly lutescent or pale brownish, not noticeably darker at apices than elsewhere. \textit{pallidula} Coquillett.

4. Proboscis distinctly more than twice as long as height of head; fork of third vein slightly bent in middle, base of cell enclosed by it acute posteriorly. \textit{infumata} Coquillett.

Proboscis less than twice as long as height of head; fork of third vein rather abruptly bent at middle, the base of cell enclosed by it obtuse posteriorly. \textit{subinfumata}, n. sp.

Empis infumata Coquillett.


Two specimens in rather poor condition, having been wet, obtained June 27, 1914 (lot 49, G. D. Hanna), on St. George Island, are evidently referable to this species. Originally described from Popof Island, Alaska.

Empis subinfumata, n. sp.

\textit{Female}.—A more robust species than \textit{infumata} with a more intense black coloring, the legs and palpi being entirely black. The thoracic hairs are more conspicuous and the legs are rather stouter. The hind femora and tibia each possess a sulcus on the anterior surface apically, but this may not be evident in fresh, well-matured examples. Other characters are mentioned in key.

Length, 6 mm.

\textit{Type locality}.—St. George Island, June 16, 1914 (lot 35, G. D. Hanna). One specimen.
Empis sp.

A female taken May 1, 1913 (lot 18, A. G. Whitney) on St. Paul Island, very probably represents a distinct species. It differs from subinfumata in having the mesonotum much more distinctly pruinose and in having 4 notopleural bristles, but is in such poor condition that I do not deem it advisable to describe it as new.

Empis sp.


Possibly one of the species listed above.

Empis frontalis Coquillett.


This species was originally described from specimens obtained on St. George Island by Professor Kincaid and is represented in the collection by 2 females also from that island. The data connected with the specimens are as follows:

June 17, 1914 (lot 49, G. D. Hanna).
August 4, 1914 (G. D. Hanna).

Genus Rhamphomyia Meigen.

This genus is represented by one species of which there are 56 specimens in the collection. I can not definitely associate it with any described North American species and describe it herewith.

I have reared one species of this genus from larvae found in rotten tree-stumps.

Rhamphomyia opacithorax, n. sp.

Male.—Black, slightly shining, the thorax almost entirely opaque, because of the dense brownish surface pruinescence. Head entirely black. Mesonotum not vittate, hairs and bristles black. Abdomen not so distinctly pruinescent as thorax, the hairs yellowish or whitish. Legs entirely black, the femora glossy; surface hairs fuscous. Wings whitish hyaline, veins brown, stigma brown. Halteres brown, knobs fuscous.

Eyes contiguous for one-half the length of frons; third antennal joint long, tapering from base to apex; style nearly one-third as long as third joint; proboscis not over 1 ½ times as long as height of head. Mesonotum with very long upright hairs laterally; acrostichals 2-rowed, very weak; scutellum with 4 bristles. Hairs on abdomen rather long; hypopygium as in Plate XIII, Figure 15. Legs moderately stout; basal joint of fore tarsi slender, not as thick as tibia at apex; hind femora and tibiae slightly thickened, the lat-
ter appreciably so at apices; dorsal surfaces of hind tibiae clothed with rather dense soft hairs which become longer from base to apex; basal joint of hind tarsi thicker than basal joints of other tarsi but slightly thinner than hind tibiae apically, the dorsal surface with long hairs. Greatest length of discal cell equal to length of last section of fifth vein; sixth vein incomplete; veins 1 to 3 more distinct than other veins.

_Female._—Differs from the male in having the wings rather uniformly pale brownish, all the veins equally distinct, the hind legs less stout and without long hairs.

Length, 4.25–5.25 mm.

_Type locality._—St. Paul Island, July 24, 1914 (lot 195, A. G. Whitney), 56 specimens.

Rhamphomyia sp.


Family DOLICHOPODIDAE.

A surprising feature of the present collection is the fact that there is but one species of Dolichopodidae in it. The majority of the members of this family are aquatic, many of the species being confined to the seashore. The single species represented in the material before me belongs to a group that is invariably aquatic in habit, the adults running with facility on the surface of pools of water on or near the seashore. Several species belonging to genera closely allied to _Hydrophorus_ are predaceous and in some manner the whole family has been credited by various authors as being predaceous, which is erroneous, the great majority of species in the family feeding upon nectar or other liquids.

_Genus Hydrophorus_ Fallen.

**Hydrophorus fumipennis** Van Duzee.


This species is represented by 60 specimens taken on St. George Island, by G. D. Hanna, and 1 specimen by the same collector on St. Paul Island, August 16, 1915. The St. George specimens bear dates and lot numbers as follows: 2 specimens, June 4, Lot No. 2; 4 specimens, June 10, Lot No. 11; 9 specimens, June 16, Lot No. 36; 4 specimens, June 17, Lot No. 44. Lot No. 2 was taken in grass and on very wet, soggy ground near Village Landing; Lot No. 11 near beach at East Landing; Lot No. 36 toward East Rookery from Village;
and Lot 44 around a sphagnum bog one-fourth mile west of Village. Specimens from St. George without lot numbers are: 13, September 3, 1913; 9, May 4, 1914; and 19, April 1, 1914, G. D. Hanna.

The species was originally described from St. Paul Island.

Suborder Cyclorrhapha.

DIVISION ASCHIZA.

Family PHORIDAE.

The larvae of this family have in the different genera very diverse habits. Some are internal parasites of living insects, larvae, pupae, and imagines, but the great majority are scavengers, feeding upon decaying animal and vegetable matter. A summary of the larval habits appears in my paper on the family printed in 1912.*

The only species in the present collection belongs to the genus *Aphiochaeta* and to the group of that genus that feed upon fungi in their larval stages.

Genus *Aphiochaeta* Brues.

*Aphiochaeta dubitata* Malloch.


Six specimens with data as follows:

St. George Island.

1 specimen, June 16 (lot 32, G. D. Hanna).

3 specimens, June 17 (lot 37, G. D. Hanna).

St. Paul Island.

2 specimens, August 16, 1915 (G. D. Hanna).

Family SYRPHIDAE.

The larvae of the different genera of Syrphidae have very diverse habits; some are scavengers, others are aphidophagous, while some live in nests of Hymenoptera, assumably feeding upon the detritis of the nests. The two species in the present collection are probably scavengers in an aquatic or semiaquatic habitat in their larval states.

Genus *Helophilus* Meigen.

*Helophilus borealis* Staeger.


This species which was originally described from Greenland is represented in the collection by one female the data for which is August 1, 1914 (E. A. Preble).

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Helophilus dychei Williston.


This species, which was originally described from specimens obtained at Sitka, Alaska, is represented by 2 males and 1 female in this collection. The data are as follows:

- St. George, August 22, 1913 (G. D. Hanna).
- St. George, June 14, 1914 (Lot 18, G. D. Hanna).
- St. Paul, June 5, 1913 (Lot 38, A. G. Whitney).

The thorax in both specimens is very densely long pilose and the 2 abbreviated discal stripes are very indistinct, almost invisible.

Genus *Pterallastes* Loew.

*Pterallastes borealis* Cole.


Genus *Syrphus* Fabricius.

*Syrphus contumax* Osten Sacken.


**DIVISION SCHIZOPHORA.**

**Family ANTHOMYIIDAE.**

The larvae of the species comprising this family are mostly phytophagous or scavengers, though certain species are recorded as parasitic upon nestlings of some birds, living attached to various parts of their bodies. The few species in the collection before me belong apparently to the group that feeds upon decaying vegetable matter; a closely allied species was reared by me from rotten wood. The family is well represented in North America, but very few collectors know more than a small percentage of the species.

**Subfamily PHAONINAE.**

*Genus Phaonia* Robineau-Desvoidy.

This genus is distinguished from others of the subfamily in this paper by having in both sexes a strong bristle beyond middle on the postero-dorsal surface of hind tibia. A comprehensive revision of the genus by the writer is now ready for the press. There is but one species known to me from the Pribilof Islands.
Phaonia minima Malloch.


Genus Helina Robineau-Desvoidy.

The name Helina has been used by me in all of my recent papers on Anthomyiidae for a segregate of that group listed under the generic name Mydaea R-D. by Stein and other authors. The true species of Mydaea all have the third wing-vein setulose at base above and below, and the females have the penultimate abdominal sternite with short stout bristles. Helina as at present limited has no species that possesses the above combination of characters.

The species hannai, of which a full description is presented herein, was included in a recently published synopsis of the genus by the writer and a description also included.  

Helina borealis Malloch.


Helina hannai Malloch.


Puparium.—Length, 8 mm.; diameter at middle, 2.5 mm. Color, reddish testaceous, distinctly shining. Cephalic extremity rather slender, glossy; anterior margin of first dorsal thoracic segment subcarinate; integument throughout with very minute longitudinal striae, which are not continuous but in the form of short, slightly irregular lines; transverse rugae indistinct anteriorly, except between the last thoracic and first abdominal segments, becoming noticeable between the third and fourth abdominal segments and from that point becoming stronger to apex where they are present in the form of conspicuous raised ridges; lateral fasciform areas distinct, margined throughout their length by a series of microscopic rounded swellings, which series is continued over the venter in the form of a single line along the margin of each segment; each ventral segment has 2 short transverse series of similar raised areas on the disc (dorsal segments glued to card and thus invisible); anal opening rather large, surrounded by a heart-shaped slightly elevated ridge (Pl. XV, fig. 29); anal spiracles consisting of 3 slit-like openings on a slightly raised base (fig. 30).

Imago.—Male. Black, distinctly shining. Head black; orbits with silvery pile; frontal stripe opaque black. Thorax without dis-


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Distinct pruinescence, with a faint bronzy tinge, and indistinctly trivitate anteriorly. Abdomen, when viewed from behind, with distinct brownish pruinescence and continuous dorso-central longitudinal black stripe; in some lights with a slight bronzy reflection. Legs black. Wings slightly fuscous, base yellow; cross veins not infused. Calyptrae bright yellow. Halteres brown, knobs black.

Eyes distinctly separated, narrowest part of stripe about one-tenth the width of head at that point; width of frons at base of antennae about one-fourth that of head at that point; orbital bristles strong and of moderate length; third antennal joint over twice the length of second; arista very short haired; eyes with very few microscopic hairs; face slightly receding toward lower margin; cheeks with numerous bristly hairs; proboscis rather thick, of moderate length; palpi slightly dilated apically. Acrostichals irregularly 4-rowed; dorso-centrals 2+4. Abdomen subcylindrical, elongate, slightly narrowed apically; hypopygium small, almost entirely retracted; surface hairs on dorsal segments strong, especially on apical 2 segments. Fore tibia with 2–3 weak bristles on the postero-ventral surface; mid tibia with 2 posterior bristles; hind tibia with 2 antero-dorsal and 2 antero-ventral bristles. Costal spine weak; third and fourth veins slightly divergent apically, the former with 2–3 bristles at base; outer cross vein slightly undulated; last section of fourth vein less than 1.5 as long as preceding section.

Female.—Agrees in color with the male except that the abdomen is less distinctly pruinose. Frons over one-third the width of head; ocellar triangle produced in the form of a long slender point nearly to anterior margin; upper orbital directed outward, the others inward; cruciate central bristles absent; cheeks higher than in male, each about one-third as high as eye. Abdomen rather broad. In other respects as male. Length, 6.5–7.5 mm.

Four specimens, St. George Island, June 24, 1914 (lot 46, G. D. Hanna), 1 male and puparium, the male in poor condition, June 20, 1913 (lot 41, A. G. Whitney); 1 male, abnormal in having 4 bristles on antero-dorsal surface of hind tibia, June 10, 1914 (lot 9, G. D. Hanna); 1 male and 2 females, June 17, 1914 (lot 42, G. D. Hanna).

The example mounted along with the empty puparium bears no data that throws any light upon the habits of the larva, neither is there any data which indicates the habits of the adults of the other lots.

*Helina* sp.

A female in very poor condition differs distinctly from the foregoing; I am unable to identify it with any described species. Because of its sex and condition, I refrain from attempting a description of the species.

Locality, St. George Island, July 8, 1914 (lot 55, G. D. Hanna).
Genus *Mydaea* Robineau-Desvoidy.

*M. rugia* (Walker).


Genus *Melanochelia* Rondani.

The species of this genus resemble those of *Helina* R-D. that have the abdomen with paired dorsal abdominal spots, but they differ in having the arista bare or pubescent. The species form a very homogeneous group and although rather closely resembling the above mentioned group in *Helina*, they seem also to differ largely in habits of the adults. The species of *Melanochelia* are most generally found near streams or on the shores of lakes or of the sea, and many species may be taken upon the exposed surfaces of rocks in stream beds, especially in sunshine, though they are very quick of flight and difficult to detect because their gray and black colors blend very well into the color of the rocks upon which they settle. One species that I have found commonly in Scotland is predaceous upon insects, but the majority of the adults are flower frequenters. The larval habits are not well known but some are feeders upon decaying animal and vegetable matter.

*Melanochelia nobilis* Stein.


There are two males and one female of this species in the material before me. The males, although in rather poor condition, agree in almost every respect with Stein's description. The specimen in the best condition shows indications of thoracic vittae but in all other respects agrees with the original description. The female I am not so certain of but consider it very probably as belonging to *nobilis*.

*Localities.*—Males, St. George Island, June 17, 1914 (lot 42, G. D. Hanna); female, St. Paul Island, July 21, 1913 (lot 85, A. G. Whitney). Lot 42 was taken on uplands toward Staraya Artel; lot 85 is given as Webster House, Northeast Point.

The original description of this species was made from a male obtained in Alaska. Coquillett subsequently recorded it from Sitka, Seldovia, and Popof Island, Alaska.19

*Melanochelia sanctipauli* Malloch.


Described from St. Paul Island, July 12, 1920 (G. D. Hanna).
Melanochelia spinicosta Malloch.


Described from St. Paul Island, and recorded from St. George Island, June 30, July 12, and August 10, 1920 (G. D. Hanna).

Genus *Eriphia* Meigen.

*Eriphia cinerea* Meigen.


Collected in 1920, by G. D. Hanna and recently recorded for the first time from this hemisphere (Proc. Calif. Acad. Sciences, 4th ser., vol. 11, 1921, p. 178).

Genus *Eupogonomyia* Malloch.

*Eupogonomyia pribilofensis* Malloch.


Genus *Hydrophoria* Robineau-Desvoidy.

This genus is represented by a large number of specimens belonging to a single species.

Hydrophoria alaskensis Malloch. (Pl. XV, fig. 34.)


St. George Island—

14 specimens, June 8, 1914 (lot 7, G. D. Hanna).
9 specimens, June 10, 1914 (lot 9, G. D. Hanna).
1 specimen, June 16, 1914 (lot 34, G. D. Hanna).
26 specimens, June 16, 1914 (lot 35, G. D. Hanna).
2 specimens, May 6, 1914 (G. D. Hanna).
1 specimen, June 16, 1914 (lot 36, G. D. Hanna).
19 specimens, June 17, 1914 (lot 42, G. D. Hanna).
2 specimens, June 24, 1914 (lot 46, G. D. Hanna).
2 specimens, June 25, 1914 (lot 47, G. D. Hanna).

Lot 7 has the following data: "Found on several species of flowers and on grass. When approached it darts into the grass but never tries to fly away. Uplands." I am unaware of this characteristic in other anthomyids; it may be due to prevailing strong winds. The remaining lots were evidently collected by sweeping and bear no data of interest. The places of collection were mostly "towards East Rookery" and "towards North Rookery" with a reference to "Uplands" towards Staraya Artel in the case of Lot 42. All the specimens were taken on St. George Island. I have recorded the occurrence of this species from St. Paul Island, June 21, 1920, G. D. Hanna (Proc. Calif. Acad. Sciences, 4th ser., vol. 11, 1921, p. 182).
Genus *Hylemyia* Robineau-Desvoidy.

This genus contains a large number of very closely allied species, although the number recorded from North America is comparatively small. I have reared some of the European species from decaying vegetation and from manure, but several occur in the larval stage upon the roots of various plants, wild and cultivated. There is a single species in the present collection which appears to be new to science.

*Hylemyia flavisquama*, n. sp.

*Male.*—Black, very slightly shiny. Head black; frontal stripe orange red, orbits blackish brown, distinctly silky; facial orbits and cheeks brown, with silky surface; face blackish brown, surface with brownish pile. Thorax with faint pruinescence, most distinct on 2 narrow lines between the acrostichals and the dorso-centrals, and on the lateral anterior angles. Abdomen with grayish pruinescence; when viewed from behind there is a distinct dorso-central stripe visible which is not disconnected at the abdominal sutures and is laterally extended anteriorly in the form of a narrow stripe along the fore margin of each segment. Legs black. Wings slightly grayish or fuscous. Squamae bright yellow, fringes concolorous. Halteres brown at base, knobs yellow.

Eyes distinctly separated, the narrowest part of frons about one-fifth the width of either eye; above bases of antennae the frons is over one-fourth the width of head at that point; orbital bristles very long though fine, about 6 pairs present on lower orbits in addition to a number of weaker hairs; face in profile protruding beyond eyes about as far as the width of third antennal joint, mouth margin protuberant; antenna of moderate length; arista pubescent; cheeks with numerous long hairs, the upper ones upcurved, those on vibrissal angle strong, the vibrissae noticeably strong; cheeks broader than third antennal joint; proboscis rather long, stout; palpi slender, slightly dilated apically, with a number of weak surface hairs. Thoracic hairs strong; 2 pairs of very strong presutural dorso-centrals; acrostichals 4-rowed anterior to suture. Abdomen equal in length to thorax, rather broad, the surface with conspicuous hairs; hypopygium rather small, without conspicuous lamellae. Fore tibia with a weak bristle at middle on postero-ventral surface (usually with a still weaker one below it), and a short one below middle on antero-dorsal surface, preapical bristle usually duplicated; antero-ventral surface of mid-femur with a graduated series of bristles, the longer ones at the base; mid-tibia usually with the following bristles: 1 antero-ventral, 2 antero-dorsal, 3-4 postero-dorsal, and 2-3 postero-ventral; hind femora with a rather irregular series of strong bristles on the antero-dorsal and antero-ventral surfaces; hind tibia...
with antero- and postero-dorsal surfaces armed with series of rather strong bristles; postero-ventral surface with usually 2 weak bristles near base, the uppermost just above middle. Costa with black, setulose hairs; costal spine small; inner cross vein just beyond apex of first vein; outer cross vein almost straight, its upper extremity much nearer apex of wing than its lower; veins 3 and 4 slightly convergent apically; last section of 4 about one and two-thirds times the length of penultimate section.

*Female.*—Differs from the male in being less intensely black and in having the surface of the body parts more distinctly pruinose; the upper half of the central stripe of frons is velvety black, merging into the bright orange of the anterior portion. The base of the wing is noticeably yellowish.

Frons over one-third the head width; orbits each over half as wide as center stripe; upper 2 (or 3) orbitals directed slightly outward, lower 4 slightly inward; cruciate frontal bristles strong; head much as in the male in other respects except that the hairs on the cheeks are less numerous and much stronger, 2 or 3 slightly upwardly directed bristles being noticeably so. Thorax with less hair than in male; acrostichals irregularly 4-rowed. Legs with a similar armature to those of male, the pair of weak bristles on postero-ventral surface of fore tibiae either absent or represented by very weak hairs.

Length, 3.75–4.25 mm.

*Type.*—St. George Island, June 14, 1914 (lot 19, G. D. Hanna), vicinity of Garden Cove.

Paratypes:

5 specimens, June 16, 1914 (lot 35, G. D. Hanna).
2 specimens, June 17, 1914 (lot 42, G. D. Hanna).
2 specimens, June 25, 1914 (lot 47, G. D. Hanna).
3 specimens (including allotype), July 4, 1914 (lot 52, G. D. Hanna).
13 specimens, July 8, 1914 (lot 55, G. D. Hanna).

The data contains no information as to habits, the specimens being recorded as from "toward" the various rookeries, and all are from St. George Island.

This species has much the appearance of *Anthomyia radicum* Linnaeus, but differs in having the upper scale of squamae larger than the under one. From *P. badia* Walker it differs in having the acrostichals 4-rowed instead of 2-rowed and in having the squamae yellow instead of whitish.

*Hylemyia* sp.

A male which is rather smaller than the smallest specimen of the preceding species and differs in having the acrostichals 2-rowed, represents a distinct species, but the condition of the specimen precludes my arriving at a definite identification.
Locality.—St. George Island, June 17, 1914 (lot 44, G. D. Hanna). The specimen was taken with other species "around a sphagnum bog ¼ mile west of Village."

Genus Fucellia Robineau-Desvoidy.

This genus has been considered as belonging to the Anthomyiidae by several authorities while others have placed it in the Cordyluridae. However, it is most properly placed in the Anthomyiidae and is distinguished from the genera in that family which have the eyes separated in both sexes by the presence of a pair of cruciate bristles on the center of the frontal stripe.

The genus is separable from Scatophagidae, as are all Anthomyiidae known to me except 4 species, by the area below the prothoracic spiracles, above and in front of the prothoracic and stigmatal bristles, being bare instead of covered, at least in part, with long soft hairs.

Stein in 1910 revised the genus and fully described the known species; Aldrich in 1918 again revised the genus for North America and recorded 13 species as occurring in the Western Hemisphere. Of the described species 3 occur in the material before me. Two of these species, fucorum and antennata, are mentioned by Stein as occurring on St. Paul Island; the third was originally described from Greenland. A fourth species occurring in northern latitudes is pictipennis Becker, recorded from Hecla Haven, East Greenland.

The species are invariably found on or near the shore either of the sea or rivers, and generally are common. Their habits are very similar to those of the Cordyluridae, the larvae being recorded as feeding upon decaying drift, though there is no record so far as I know of the imagines being predaceous. I have taken specimens of the genus at considerable distances from the sea on the banks of various rivers and as most entomologists have the impression that the genus is exclusively maritime in habit it seems pertinent to put upon record here the capture by myself of a male of maritima at Carmi, Illinois, a town on the Little Wabash River, several hundreds of miles from the sea and nearly 300 miles from Lake Michigan, the nearest large area of fresh water where it also occurs. I have also seen a male of this species taken by R. P. Dow at Claremont, N. H., which is about 90 miles from the sea in a straight line.

Fucellia fucorum Fallen.

Scatomyza fucorum Fallen, Scatomyz., 5, 1819.

This species is widely distributed in the Arctic regions and extends as far south as Friday Harbor. Stein records it from St. Paul Island, and Meidnaja, Bering Straits, in addition to Friday

Harbor. There are records of the species from as far south as Porto Rico but it is probable that most of these refer to *maritima*. In the present collection the species is represented by 127 specimens with data as follows:

**St. George Island:**

16 specimens, May 6, 1914 (G. D. Hanna).
2 specimens, June 16, 1914 (lot 34, G. D. Hanna).
5 specimens, June 4, 1914 (lot 1, G. D. Hanna).
50 specimens, June 10, 1914 (lot 9, G. D. Hanna).
1 specimen, June 14, 1914 (lot 19, G. D. Hanna).
1 specimen, July 4, 1914 (G. D. Hanna).

**St. Paul Island:**

14 specimens, August 1, 1914 (E. A. Preble).
44 specimens, August 19, 1914 (E. A. Preble).
1 specimen, Summer, 1914 (lot 210, A. G. Whitney).
10 specimens, August 16, 1915 (G. D. Hanna).
2 specimens, August 26, 1916 (G. D. Hanna).

Lot 1 contains specimens collected about fox houses and on beach among bowlders; lot 9 contains specimens that are recorded as “very common along the beaches, living upon the decaying marine algae”; lot 19 is from the vicinity of Garden Cove; lot 34, from “toward East Rookery”; the others have no data other than that already given.

One specimen in the last lot in the series listed has 2 large mites attached to the posterior portion of thorax close to base of posterior coxae.

**Fucellia ariciiformis Holmgren.**


This species was originally described from Greenland by Holmgren and afterwards recorded from there by Lundbeck. Stein indicated in his revision of the genus the characters that are available for distinguishing the sexes from those of *fucorum* to which it is most closely related. The male possesses the tuft of short spines at base of hind femora but the tubercle at base of hind femora in *fucorum* is absent in *ariciiformis*. The female differs from that of *fucorum* in having only one antero-ventral midtibial bristle, and the antero-ventral hind tibial bristles very much stronger, more numerous, and carried nearly to base.

There are 4 specimens of the species in the present collection, with data as follows:

**St. Paul Island:**

1 female, May 23, 1914 (lot 154, A. G. Whitney).
1 female, 2 males, August 16, 1915 (G. D. Hanna).

**Fucellia antennata Stein.**


This species was originally described from Alaska, the localities given being Sitka, St. Paul Island, and Karluk. It differs from all other species in the genus in having the antennae elongated, the apex of the third joint being almost on a level with the upper mouth margin. The male is further distinguished by having the antero-ventral surface of the posterior femora with a series of closely placed bristles extending from slightly before the middle to their apices. The species has much the same habitus as *Amaurosoma*, a genus of predaceous cordylurids, but the fore femora in that genus are usually armed on their antero-ventral surfaces with a group of setulae and the cruciate frontal bristles are absent.

Amongst the material before me there are 29 specimens of *antennata* as follows:

- **St. Paul Island:**
  - 9 specimens, August 1, 1914 (E. A. Preble).
  - 14 specimens, August 19, 1914 (E. A. Preble).
  - 2 specimens, Summer, 1914 (E. A. Preble).
  - 1 specimen, May 16, 1913 (lot 28, A. G. Whitney).
  - 1 specimen, August 16, 1915 (G. D. Hanna).

Only the first and next to the last lots have any information regarding the exact place of capture attached to them. The three specimens in Lot 155 were taken in the Laboratory, as was also that in Lot 28; the latter is pinned with a specimen of *Scatophaga dasythrix*, but the data indicates nothing other than that they were taken at the same time.


**Fucellia pictipennis Becker.**


**Family SCATOPHAGIDAE.**

Some species of the subfamily Scatophaginae are remarkably common, both on the seashore and throughout areas remote from the sea, while others are invariably confined to the seashore or its immediate vicinity. All, however, are very similar in larval habits, feed-
ing upon manure or decaying vegetable matter. The adults are, so far as is known, predaceous, though they are commonly found feeding both on flowers and fresh manure. The larval habits of the species of the subfamily Cordylurinae are not very generally known. Some of them feed upon decaying vegetable matter; I have reared one species from river drift; and one species, *Hydromyza confluentis* Loew, feeds in the stems of *Nymphaea advena*, forming gall-like swellings thereon. So far as I know, the adults are predaceous, some of the genera being particularly adapted for this mode of life, the fore legs being armed with strong spines to aid in catching and retaining prey, but even where these spines are present the insects may also be found feeding upon nectar of flowers.

The material belonging to this family contained in the present collection consists principally of Scatophaginae belonging to the genus *Scatophaga*. I have taken pains to dissect the males of the species of *Scatophaga* and figure certain parts with a view to facilitating their identification for future students; this has resulted also in confirming their identity in some cases with species from more temperate latitudes.

**Subfamily Cordylurinae.**

*Cordylura beringensis*, n. sp.

*Male.*—Black, slightly shining. Anterior portion of frons reddish, merging into whitish on sides at anterior margin; face and cheeks yellowish white; frons, face, and cheeks with pale gray or whitish pruinescence; antennae black, apex of second joint brown; proboscis and palpi black. Thorax and abdomen with distinct, brownish gray pruinescence. Legs black, tarsi reddish on the ventral surfaces. Wings clear, veins black; calypterae yellowish white, their fringes white. Halteres pale brown, knobs reddish.

Frons slightly broader than eye, narrowed anteriorly; orbits usually with 6 pairs of bristles, the upper 2 pairs directed outward, the next pair directed forward, and the lower pairs incurved; third antennal joint of moderate length, rounded apically; arista plumose; vibrissae very long; cheeks very narrow; proboscis stout; palpi slender, armed with a pair of long hairlike bristles. Two pairs of dorso-central bristles on thorax anterior to suture; acrostichals 2-rowed; mesopleura with 4–5 moderately strong bristles; sternopleurum with 1 very strong bristle; scutellum with 4 marginal bristles. Abdomen short and stout; hypopygium very large, hairy; fifth ventral segment ending in 2 large rounded lateral lobes. Legs stout, the fore and hind femora especially so; all legs with long and strong bristles; fore and mid femora with long pale hairs on ventral surfaces, the latter with 2–3 strong antero-ventral bristles near apex; hind femora with a very long downward directed hair near
base on ventral surface; hind tibia with 2 antero-ventral, 3 antero-dorsal and 3 postero-dorsal bristles. Apical portion of first wing-vein bristly.

Length, 5 mm.

Type.—St. George Island, June 16, 1914 (lot 35, G. D. Hanna). The type and 2 paratypes were taken “toward East Rookery from Village.” Other paratypes as follows:

3 specimens, June 17, 1914, uplands near Staraya Artel (lot 42, G. D. Hanna).
1 specimen, June 17, 1914, near a sphagnum bog, ¼ mile west of Village (lot 44, G. D. Hanna).
1 specimen, June 25, 1914, from toward North Rookery (lot 47, G. D. Hanna).

There is a Colorado species which very closely resembles the above. It differs in having the legs with weaker bristles, the wings clearer, the inner cross vein more distinctly beyond middle of discal cell, and the first vein almost bare.

This species has a decided affinity to proboscidea Zetterstedt, a species that has a northern range in Europe. It differs, however, in being smaller and in having the abdomen much less conspicuously hairy, as well as in several other minor characters.

Genus Allomyella n. n.13

Generic characters.—Head about as high as long, face slightly retracting below, cheek of moderate width, eye higher than long, vibrissa weak, below it one bristle; antennae of moderate length, third joint subangulate at apex on upper side, arista bare, occiput with bristles along upper half on eye-margin, and below these another series or irregular group on back of head. Dorso-centrals 5, the other bristles as in Cordylura; 1 sterno-pleural; pteropleura with a few hairs. Abdomen at least as long as wings, broad, apical segment short, compressed, but little protruded. Fore tibia with short black setulae on ventral surface. First wing vein bare.

Allomyella brevipennis, n. sp.

Female.—Black, abdomen distinctly shiny. Head black; frons opaque; central stripe brown, paler anteriorly; lower part of face and anterior angles of cheeks yellow; antennae black, second joint slightly reddish apically; arista black; proboscis glossy black; palpi brown at base, yellow apically. Legs black, tibiae and tarsi testaceous yellow, the apices of the latter slightly darkened. Wings slightly brownish, the veins thick and slightly darkened, faintly infuscated along their margins. Calyptrae brown, fringes yel-

13 The generic name Allomyia given by me to this genus in my paper on the Canadian Arctic Diptera is preoccupied by Allomyia Felt and the name of my genus accordingly is changed herein.
lowish. Halteres reddish yellow. Hairs and bristles yellow, the stronger bristles on head, legs, and abdomen blackish, but paler in transmitted light.

Frons distinctly broader than eye, very slightly narrowed anteriorly; orbits each with 5 bristles, the 2 upper ones directed outward; arista bare; profile as in Plate XV, Figure 28. Thorax and abdomen with rather numerous surface hairs; pleural bristles not well distinguished from the other hairs, the prothoracic and stigmatal bristles weak. Last abdominal segment distinctly elongated, its lateral margins with a number of long bristles. Legs rather stout; fore femora distinctly incrassated; all femora with rather widely separated hair-like central bristles; fore tibia with 4 bristles, 2 on the dorsal surface (one at middle and one near tip), and 2 slightly below them transversely on posterior surface; hind tibia with the following bristles: 2 on postero-dorsal surface, one at middle and the other at one-fourth from base; 2 on antero-dorsal surface, the upper in transverse line with the upper on postero-dorsal surface, the lower slightly below middle; 2—3 on antero-ventral surface near apex. Wings not extending to apex of abdomen; third and fourth veins divergent, the former ending in apex of wing.

Length, 5.25 mm.

*Type.*—St. George Island, June 8, 1914 (lot 8, G. D. Hanna).

**Subfamily Hydromyzinæ.**

**Genus Pogonota** Becker.

*Pogonota kincaidi* Coquillett.


This species is represented by seven specimens, with data as follows: 2 males and 1 female, St. George Island, June 16, 1914 (G. D. Hanna, Lot 36); 1 male and 3 females, August 16, 1915 (G. D. Hanna). The original description was made from a male and female obtained by Prof. T. Kincaid on Popof Island, Alaska, and there are no subsequent records of the species.

**Subfamily Scatophaginæ.**

**Genus Scatophaga** Meigen.

There is not a published synopsis of the North American species of this genus, and in presenting one covering the species contained in the present collection I hope to accomplish two objects—to make it possible for future students to recognize the forms recorded, and to indicate that, similar though the species appear, there are just as good characters available for their separation as there are in most of the dipterous families and even better than there are in some.
Becker in 1894\textsuperscript{14} published the most complete study of the family that has been undertaken up to the present. In the genus *Scatophaga* the synoptic key is very full and quite satisfactory; but few of the species are described fully in the text, the author confining himself to notes upon the species and to indicating their synonymy except in the case of new species. So far as I know, the present paper is the first in which use has been made of the characters of the fifth ventral segment of the abdomen of the males except that by the writer on the Diptera of the Canadian Arctic Expedition. The differences in structure in this segment are very marked in some of the species, as can be seen from an examination of the figures. There are four distinct types of structure of this segment in the species I have examined. The simplest form is represented by 1 species, *crinita*, and has on each lateral angle of the fifth sternite a small rounded prolongation; in 3 species there is a very long prolongation of this segment on each side of the median line; *furcata* has a small, rather knoblike process on each side of the median line on posterior margin of the segment; and *stercoraria* has a similar pair to those of *furcata* in addition to the lateral elongations, presenting the most elaborate structure of any species known to me. *Stercoraria* (Pl. XIV, fig. 17) has been recorded from Alaska, but is unrepresented in the present collection, the figure being introduced here to show the difference in form of the segment. It will be observed that there is a distinct similarity in the male hypopygia of *Scatophaga* and *Coelopa* (Pl. XIV, figs. 23, 24, and 25). I published figures of the fifth sternites of the males of *S. suilla* and *S. lutaria* in my report on the Diptera collected by the Canadian Arctic Expedition, 1919.

**Key to species of Scatophaga.**


2. Mid and hind tibiae with a number of strong, outstanding bristles in addition to the soft hairs 3. Mid and hind tibiae with remarkably long soft hairs, and without strong bristles except at apex and in *crinita* one bristle near apex on posterior surface 5.

3. Cross veins of the wings not infuscated; legs black, very densely brownish pruinose, bases of tibiae indistinctly reddish; fifth ventral segment of abdomen as in Plate XIV, Figure 21 *islandica*. Cross veins of the wings conspicuously infuscated; legs either almost entirely yellow, or reddish with black femora 4.

4. Legs reddish or vinous colored, shining, femora black; hairs on hind tibiae woolly, nearly as long as the bristles, the latter rather slender; fifth ventral segment of abdomen with a long, thornlike projection on each side of the median line (Pl. XIV, fig. 20) *rubicunda*.

Legs pale testaceous or yellowish, only the fore femora in part black; hairs on hind tibiae setulose, very much shorter than the bristles, the latter very stout, fifth ventral segment of abdomen with short knoblike process on each side of the median line (Pl. XIV, fig. 22) ________________ furcata.

5. Legs shining black; abdominal hairs yellow, varying from whitish to orange; mid tibiae with a bristle near apex on the posterior surface; fifth ventral abdominal segment as in Plate XIV, Figure 19. ________________ crinita.

Legs dull black; abdominal hairs black, occasionally a few of those on the ventral surface are yellowish; mid tibiae without bristle near apex; fifth ventral abdominal segment as in Plate XIV, Figure 18. ________________ dasythrix.


Pteropleura hairy __________________________________________ 9.

7. Cross veins of the wings not infuscated; hairs on dorsum of abdomen black, contrasting sharply with those of venter and lower part of pleura, which are pale yellow and silky; legs black ________________ crinita.

Cross veins of wings conspicuously infuscated; legs in great part yellow or reddish __________________________________________ 8.

8. Large species, averaging 10 mm. in length; legs vinous in color, femora in large part black; all hairs on abdomen fuscous; apical spur on hind tibia very strong and much curved ________________ rubicunda.

Smaller species, averaging 7-8 mm. in length; legs yellow, fore femora more or less blackened above; hairs on dorsum of abdomen blackish and setulose, those on venter yellow and soft; apical spur on hind tibia of moderate strength and almost straight ________________ furcata.

9. Frons conspicuously reddish in front; tibiae reddish or brownish; hairs on mesonotum not numerous, setulose, those on hind tibia very much shorter than the intermixed bristles, and setulose; apex of abdomen with normal hairing ________________ islandica.

Frons not noticeably reddish in front; tibiae black; hairs on mesonotum numerous, long and rather soft, those on hind tibiae soft and slightly curled, some of them as long as the intermixed bristles; apex of abdomen with a noticeable tuft of soft curled black hairs ________________ dasythrix.

Scatophaga islandica Becker.


Apical ventral segment of male as Plate 14, Figure 21.

This species was originally described from specimens in the Loew collection from Iceland and Labrador. Coquillett subsequently recorded it from Commander Islands and Alaska.

There are 9 specimens in the present collection from St. Paul Island with data as follows:

4 specimens, August 19, 1914 (E. A. Preble).
1 specimen, August 1, 1914 (E. A. Preble).
4 specimens, August 16, 1915 (G. D. Hanna).

Scatophaga rubicunda Malloch.


Male.—Opaque black-brown. Head concolorous with thorax; frontal stripe orange red, orbits on lower portions grayish; face and cheeks reddish orange, their surfaces covered with grayish yellow pruinescence, antennae brownish black, apex of second joint on inner side reddish; proboscis glossy black; palpi reddish or yellowish. Disc of mesonotum with indications of 6 vittae, a median confluent pair on acrostichal area, a narrow line along the region of the dorso-central bristles and a broader irregular streak laterad of the latter. Hypopygium and apex of last segment reddish. Legs vinous colored, the femora except their apices darkened. Wings slightly grayish, with a yellow tinge along the costal region, the cross veins distinctly infuscated, veins reddish brown. Halteres reddish. Bristles black, the soft hairs fuscos.

Arista bare, swollen at base, apical part very slender; cheek half as high as eye, anterior angle with a group of 8 to 10 long, black hairs; palpi elongate, slightly leaflike. Thorax with long soft hairs, acrostichal bristles not distinguishable from the discal hairs, the dorso-central bristles barely so; pteropleura bare; scutellum with 4 strong marginal bristles and numerous long hairs. Abdominal hairs not so long as in crinita, more dense and not “crinkly”; fifth ventral plate as Plate XIV, Figure 20. Legs with long hairs; mid-tibiae with 7 long bristles distinguishable from the hairs, in addition to the apical spines, situated as follows: 2 on the antero-dorsal surface, one above the other, the upper one just below middle; 3 on the postero-dorsal surface, the upper near base; and 2 on posterior surface, in transverse line with those on the antero-dorsal surface; hind tibiae each with 6 bristles in addition to the hairs and apical spurs as follows: 3 strong ones on antero-dorsal surface, the upper one just above middle and the lower one close to tip; and 3 long hairlike ones on postero-dorsal surface, the upper one being about one-fourth from base of tibiae, the next close to middle, and the lowest one very near to apex; apical spurs bent.

Female.—Similar to the male in color. Differs from the male in having the hairs throughout shorter, stronger, and less numerous and the bristles stronger. Length, 9–10 mm.

Type.—St. George Island, June 16, 1914 (lot 34, G. D. Hanna). Paratype, St. George Island, 1 specimen, same data as type. Allo-type, St. George Island, one of 2 specimens, June 4, 1914 (lot 1, G. D. Hanna); and 2 specimens June 8, 1914 (lot 8, G. D. Hanna). Lot 34 was collected toward East Rookery from village; lot 1 about fox houses and on beach among boulders along with S. dasythrix;

This species differs from *nubifera* Coquillett in being larger and in the chaetotaxy of the mid and hind tibiae. Sometimes the femora are entirely reddish, and very rarely there are two or three long hairs present on center of pteropleura.

**Scatophaga furcata** Say.


*Cordylura fuscipennis* Zetterstedt, Ins. Lapp., p. 733, 1840.


*Scatophaga apicalis* Curtis, Appendix to Narrative of 2d Voyage in Search of Northwest Passage, p. 76, 1835.


The fifth ventral segment of the male and the hypopygium are shown in Plate 14, figures 22 and 23.

This species was first described by Say from specimens obtained in Missouri. It occurs throughout North America, extending its range well into the Arctic portions, and is quite as common in Europe as in America. There is very considerable variation in size and color in this species, which has probably caused some confusion on the part of different authors. I have dissected many examples of different sizes and of varied shades of color in an attempt to find structural differences but have failed to find any that would justify me in separating even the most extreme forms. I know that the nature of the pabulum of the larvae affects the appearance of the resultant imagines, those that have had an abundance of nutritious food being large, brightly colored, and very hairy, while those that have had a supply of rather dry and poor food are smaller, darker, and less hairy.

The normal food of the larvae of this species is manure.

In the present collection there are 83 specimens with data as follows:

St. George Island.

1 specimen, April 24, 1914 (G. D. Hanna).
1 specimen, May 6, 1914 (G. D. Hanna).
1 specimen, June 16, 1914 (lot 35, G. D. Hanna).
1 specimen, June 17, 1914 (lot 42, G. D. Hanna).
4 specimens, June 24, 1914 (lot 46, G. D. Hanna).
4 specimens, June 25, 1914 (lot 47, G. D. Hanna).
14 specimens, June 27, 1914 (lot 49, G. D. Hanna).
1 specimen, July 4, 1914 (lot 52, G. D. Hanna).
1 specimen, July 8, 1914 (lot 55, G. D. Hanna).
St. Paul Island.

11 specimens, August 16, 1914 (G. D. Hanna).
15 specimens, August 1, 1914 (E. A. Preble).
35 specimens, August 19, 1914 (E. A. Preble).
3 specimens, Summer, 1914 (E. A. Preble).
14 specimens, 1916 (G. D. Hanna).

Only lot 55 is mentioned definitely as having been taken on the shore; the others are recorded as from “toward East Rookery”; “uplands near Staraya Artel”; “toward North Rookery,” and “toward Zapadni.”


Scatophaga crinita Coquillett.


The fifth ventral abdominal segment of the male is as in Plate 14, Figure 19.

This species was originally described from specimens obtained on Bering Island. The series of specimens in the present collection shows a very considerable variation both in the size of the different specimens and in the color of the hairs on the body, the latter varying from yellowish white to deep orange. As indicated under the previous species there very probably is some connection between these conditions and the nature of the larval pabulum.

There are 89 specimens in the collection with data as follows:

St. Paul Island.

1 specimen, May 23, 1914 (lot 154, A. G. Whitney).
3 specimens, June 11, 1913 (lot 44, A. G. Whitney).
1 specimen, July 3, 1913 (lot 60, A. G. Whitney).
1 specimen, July 22, 1913 (lot 94, A. G. Whitney).
1 specimen, Summer, 1914 (E. A. Preble).
1 specimen, August 16, 1915 (G. D. Hanna).
5 specimens, June-Aug. 1916 (G. D. Hanna).

St. George Island.

2 specimens, Sept. 3, 1913 (G. D. Hanna).
2 specimens, Sept. 6, 1913 (G. D. Hanna).
2 specimens, May 6, 1914 (G. D. Hanna).
3 specimens, June 4, 1914 (lot 1, G. D. Hanna).
1 specimen, June 8, 1914 (lot 8, G. D. Hanna).
1 specimen, June 10, 1914 (lot 9, G. D. Hanna).
6 specimens, June 14, 1914 (lot 18, G. D. Hanna).
1 specimen, June 14, 1914 (lot 19, G. D. Hanna).
16 specimens, June 16, 1914 (lot 34, G. D. Hanna).
9 specimens, June 16, 1914 (lot 26, G. D. Hanna).
1 specimen, June 16, 1914 (no number, G. D. Hanna).

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7 specimens, June 17, 1914 (lot 38, G. D. Hanna).
4 specimens, June 24, 1914 (lot 46, G. D. Hanna).
10 specimens, June 27, 1914 (lot 49, G. D. Hanna).
15 specimens, July 4, 1914 (lot 52, G. D. Hanna).
1 specimen, July 8, 1914 (lot 55, G. D. Hanna).

The specimen of lot 60 was taken on Otter Island at the same time as the specimen of *S. dasythrix* bearing the same number. Lots 44 and 94 were taken on peninsulas on St. Paul Island. The specimen bearing the Hanna lot number 8 appears to have been taken on flowers (see also under *S. rubicunda*). Judging from the data pertaining to the collection this species is found both along the shore and on the uplands, many examples being obtained towards East Rookery, at Garden Cove, and towards Zapadni.

*Scatophaga dasythrix* Becker.


The fifth ventral abdominal segment of the male is shown in Plate 14, Figure 18.

This species was originally described from specimens in the collections of Loew and Schnabl, obtained from Bering Straits. Subsequently Coquillett recorded its occurrence on Bering Island.

In the present collection there are 108 specimens with data as follows:

**St. George Island.**

1 specimen, August 16, 1913 (G. D. Hanna).
2 specimens, May 17, 1914 (G. D. Hanna).
62 specimens, June 4, 1914 (lot 1, G. D. Hanna).
1 specimen, June 10, 1914 (lot 9, G. D. Hanna).
10 specimens, June 16, 1914 (lot 34, G. D. Hanna).
1 specimen, July 4, 1914 (lot 52, G. D. Hanna).

**St. Paul Island.**

1 specimen, April 13, 1913 (lot 7, A. G. Whitney).
1 specimen, May 16, 1913 (lot 28, A. G. Whitney).
2 specimens, June 24, 1913 (lot 57, A. G. Whitney).
1 specimen, July 6, 1913 (lot 63, A. G. Whitney).
1 specimen, July 6, 1913 (lot 64, A. G. Whitney).
1 specimen, July 6, 1913 (lot 66, A. G. Whitney).
2 specimens, July 18, 1913 (lot 80, A. G. Whitney).
2 specimens, July 22, 1913 (lot 94, A. G. Whitney).
3 specimens, summer, 1914 (E. A. Preble).
2 specimens, August 19, 1914 (E. A. Preble).
1 specimen, August 1, 1914 (E. A. Preble).
2 specimens, August 16, 1915 (G. D. Hanna).
11 specimens, July–August, 1916 (G. D. Hanna).

**Otter Island (6 miles from St. Paul Island).**

1 specimen, July 3, 1914 (lot 60, A. G. Whitney).

**Sealion Rock, or "Sivutch” Island.**

10 specimens, June 29, 1914 (lot 182, A. G. Whitney).
This species appears from the number of examples and the recorded data to be the most common of those in the collection. Several examples were taken in copula and three with prey. The prey represents 3 species: *Fucellia antennata*, *Leria fraterna*, and *Leria leucostoma*. The specimens in lot 182 were taken on the grassy summit of Seal Lion Rock at a height of 60 feet.

D. W. Coquillett records from the Pribilofs (in Schwarz, E. A., In The Fur Seals and Fur-Seafl Islands of the North Pacific Ocean, Part 3, pp. 550-552, 1899) one species in addition to those listed in the present paper, which, however, may be only nominally distinct: *Scatophaga diadema* Wiedemann.—W. L. M.

Family HELOMYZIDAE.

The species of Helomyzidae are usually found upon carrion or decaying vegetable matter, though certain species of the genus *Leria* have been recorded as frequenting caves where they feed upon fungi and droppings of bats. The species recorded as frequenting caves are not specialized in any manner that adapts them to this habitat and are found in other situations also. A species of the genus *Heteromyza* that has been found in caves, I have found on carrion in an open field in Scotland. The members of the genus *Eccoptomera* are found in the larval and pupal stages in underground nests of moles, and I have found the imagines there also, but I have sometimes taken the latter by sweeping the undergrowth in Scotch woods.

The family is not well represented by species in the material before me but there are a large number of specimens.

A single male of each species in the collection was taken as the prey of *Scatophaga dasythrix*. These are recorded under that species.

Aldrich and Darlington have published an extensive paper on the family. 15

Genus *Leria* Robineau-Desvoidy.

*Leria fraterna* Loew.


This species, which was originally described from Sitka, Alaska, by Loew, is represented by 147 specimens in the present collection from the following localities:

St. George Island.

31 specimens, April-May, 1914 (G. D. Hanna).

23 specimens, June 4, 1914 (lot 1, G. D. Hanna).

6 specimens, June 8, 1914 (lot 8, G. D. Hanna).

18 specimens, June 16, 1914 (lot 34, G. D. Hanna).
1 specimen, June 16, 1914 (lot 35, G. D. Hanna).
3 specimens, June 14, 1914 (lot 19, G. D. Hanna).
1 specimen, June 27, 1914 (lot 49, G. D. Hanna).
2 specimens, July 4, 1914 (lot 52, G. D. Hanna).
6 specimens, June 24, 1914 (lot 46, G. D. Hanna).
1 specimen, June 14, 1914 (lot 23, G. D. Hanna).
3 specimens, June 17, 1914 (lot 42, G. D. Hanna).
1 specimen, June 10, 1914 (lot 9, G. D. Hanna).

St. Paul Island.

5 specimens, May 17, 1912 (M. C. Marsh).
13 specimens, May 16, 1913 (lot 26, A. G. Whitney).
2 specimens, May 16, 1913 (lot 24, A. G. Whitney).
6 specimens, May 19, 1913 (lot 132, A. G. Whitney).
8 specimens, May 23, 1913 (lot 156, A. G. Whitney).
1 specimen, May 23, 1913 (lot 154, A. G. Whitney).
1 specimen, July 11, 1913 (lot 70, A. G. Whitney).
2 specimens, Aug. 1, 1914 (E. A. Preble).
6 specimens, summer, 1914 (E. A. Preble).
1 specimen (see under Scatophaga dasythrix, lot 64, A. G. W.).

The collections were made in various portions of the islands, some of them about fox houses and on beaches, while others were made amongst grass and herbage. No indication is given as to more exact habitats.

Aldrich and Darlington give the following localities for this species:

Moscow, Idaho.
St. Anthony Park, Minn.
Montreal, Canada.
Ungava Bay, Labrador.
Hudson Bay Territory.

It has also been recorded by Coquillett as occurring in Alaska, British Columbia, and on Mount Washington, N. H. A female specimen in the collection of the Illinois State Laboratory of Natural History does not differ materially from the specimens before me; the data on this specimen is Algonquin, Ill., March 21, 1894.

Leria leucostoma Loew.


This species, which also was originally described from Alaska by Loew, is represented by 18 specimens, as follows:

St. George Island.

2 specimens, September 2, 1913 (G. D. Hanna).
2 specimens, April 12, 1914 (G. D. Hanna).
1 specimen, June 16, 1914 (lot 35, G. D. Hanna).
2 specimens, June 8, 1914 (lot 8, G. D. Hanna).
5 specimens, July 4, 1914 (lot 52, G. D. Hanna).
1 specimen, June 27, 1914 (lot 40, G. D. Hanna).
St. Paul Island.

August 19, 1915 (G. D. Hanna).
June 29, 1914 (lot 182, A. G. Whitney).
July 6, 1914 (lot 66, A. G. Whitney).
August 1 and 19, 1914 (E. A. Preble).
(See under Scatophaga dasythrix, lot 63, A. G. W.)

Aldrich and Darlington record this species from Hampton, N. H.; White Mountains, N. H.; and Mount Constitution, Wash.; Coquillett has recorded it from Alaska and White Mountains, N. H.

Leria pectinata Loew has been recorded by Coquillett from the Pribilofs (in Schwarz, E. A., in The Fur Seals and Fur Seal Islands of the North Pacific Ocean, pt. 3, 1899, pp. 550-552).

Leria crassipes Loew has been recorded by Cole (Proc. Calif. Acad. Sci., 4th ser., vol. 11, p. 173, Nov., 1921), from St. Paul Island, July 4 and August 10 (G. D. Hanna). However, it is doubtful if this species occurs in North America; the specimens recorded are almost without doubt leucostoma Loew.

Leria sp.


Family BORBORIDAE.

The species comprising this family live in the larval state in manure, fungi, carrion, and decaying vegetable matter. One species has been recorded as living in ants’ nests and another in water collected in epiphytic bromeliads. From the data accompanying the specimens in the present collection I assume that the species conform to the most general mode of life, i. e., pass the larval stage in decaying vegetable matter or in manure.

Genus Borborus Meigen.

This genus is represented by two species: annulus Walker and subapterus n. sp. The former has the normal borborid habitus but the latter has the wings much abbreviated and is thus readily separated from any described species occurring in North America. To facilitate the identification of annulus, which is rather poorly described by Walker, it is redescribed herewith.

Cole records (Proc. Calif. Acad. Sci., 4th ser., vol. 11, p. 173, Nov., 1921), two species of this family from the Pribilof Islands, “one a Copromyza (Borborus) and the other a Leptocera, but the specimens are in poor condition for identification.”
Borborus annulus Walker.

*Male and female.*—Black, shining, with a slight olivaceous tinge. Head black, frontal triangle and orbits slightly shining, brownish pruinose, center stripe opaque black, anteriorly reddish, face brown, reddish or yellowish at base of vibrissae, distinctly brownish pruinose; antennae black or slightly brownish. Mesonotum with yellowish pruinoscence which does not obscure the shining black ground color. Abdomen glossy black. Legs black, yellow on apices of coxae, trochanters, extreme bases of femora, bases of tibiae (broadly), apices of tibiae (narrowly), and entire tarsi. In addition to these yellow markings there is generally a similarly colored narrow band near the apices of the middle and hind femora which is not mentioned in the original description. Wings slightly yellowish, veins brown, crossveins broadly infuscated. Halteres brownish yellow.

Frons as broad as its length at center; orbits each with two slender bristles directed outward over eyes; center stripe with numerous setulose hairs, especially on anterior portions of opaque areas; antennae of moderate size, third joint rounded anteriorly; arista with sparse but distinct pubescence, entire length of arista about twice that of anterior width of frons; face concave in profile, distinctly produced between antennae and with a rounded central keel; labrum distinctly protruded; proboscis large and fleshy; vibrissa long, buccal bristle shorter than vibrissa, upwardly directed. Mesonotum with 3 pairs of dorso-centrals and between these 4 longitudinal rows of short setulose hairs; scutellum with 4 marginal bristles. Abdomen broad and short, first visible segment elongated; male hypopygium of moderate size, protuberant, its surface with numerous short hairs. Legs rather long, fore and mid femora slightly thickened and perceptibly bent; mid femora with 3 bristles near apex on the anterior surface; mid tibiae with a series of 6-7 short bristles from base to apex on antero-dorsal surface; hind tibiae with an outstanding setulose hair on the antero-ventral surface beyond middle, a distinct but slender preapical dorsal bristle and a rather weak apical thorn-like spur; basal joint of hind tarsi thickened and about two-thirds as long as second. Distance from humeral cross-vein to end of first vein about one-third as long as next costal division and slightly longer than third; inner cross-vein slightly before middle of discal cell; last section of fourth vein slightly longer than preceding section; outer cross-vein upright; fifth vein not extending to margin of wing. Length 3.5-4 mm.

Originally described from "York Factory and St. Martin Falls," Canada. Aldrich states that the last named locality is now known...
as Martin's Falls and is located "in longitude 86.30, latitude 51.30, in other words, about 200 miles north of the northern arch of Lake Superior" (Cat. Dipt. N. Amer., p. 66). Coquillett has since recorded the species from Popof Island, Alaska, and Schwarz lists it from Pribilof Islands. The species is represented in the material before me by 32 specimens with data as follows:

**St. George Island.**

- 2 specimens, April 17, 1914 (G. D. Hanna).
- 13 specimens, June 4, 1914 (lot 2, G. D. Hanna), Taken on very wet soggy ground near Village landing.
- 3 specimens, June 14, 1914 (lot 23, G. D. Hanna), Garden Cove.
- 4 specimens, June 16, 1914 (lot 38, G. D. Hanna), Toward East Rookery from village.
- 2 specimens, same date as last (lot 35, G. D. Hanna).

**St. Paul Island.**

- 3 specimens, May 16, 1913 (lot 27, A. G. Whitney), taken in Company House bathroom.
- 4 female specimens, May 23, 1914 (lot 153, G. D. Hanna), from privy.
- 2 specimens taken in the summer of 1914, one marked lot 210, A. G. Whitney, and other collected by E. A. Preble.

*Borborus subapterus*, n. sp. 

**Female.**—Black, shining; venter of abdomen and stems of halteres brown. Wings brown. Frons distinctly longer at center than its greatest width; frontal triangle and orbits shining, center stripe opaque; each orbit with 2 long slender bristles which are very slightly outwardly directed; center stripe with hairs much as in *annulus*; antennae rather above the average size, third joint disc-like; arista very slender, distinctly but sparsely pubescent, entire length of arista about 1½ times that of anterior width of frons; hairs on basal joint of antenna long and fine; face concave in profile, distinctly keeled; labrum much protruded, vibrissa very long and slender; buccal bristle short and hairlike, upwardly directed. Mesonotum with numerous rather long discal hairs which obscure the 3 pairs of dorso-centrals; scutellum with 4 weak marginal bristles. Basal abdominal segment not noticeably elongated; all segments with very few short hairs. Legs slightly elongated; fore and hind femora noticeably stronger than mid pair; mid tibiae with 3 bristles, a pair about one-fourth from apex, one of which is on the antero-ventral and the other on the postero-ventral surface, and one on the dorsal surface near apex; hind tibiae with weak, hairlike preapical bristle, and weak, almost straight, apical spur; basal joint of hind tarsi much dilated and over two-thirds as long as second; surfaces of all legs with numerous soft hairs. Wings abbreviated, extending to middle of fourth abdominal segment; venation as in Plate XV, Figure 27. Length 3.5 mm.
Male.—Agrees with the female in color and general structure. Differs in having the abdomen robust, and obtusely rounded at apex, with the hypopygium of moderate size.

Type locality.—St. George Island, June 16, 1914, "toward East Rookery from village." (Lot No. 36, G. D. Hanna.) Two paratypes, St. George Island, along Garden Cove Creek (G. D. Hanna).

*Borborus pedestris* Meigen, a European species, has the wings much shorter than the present species, scarcely longer than the scutellum, and differs also in color. *Leptocera nivalis* Haliday, a species belonging to an allied genus and also European, occurs in winter generally and has the faculty of leaping exceptionally developed.

Genus *Leptocera* Olivier.

This genus is listed as *Limosina* Macquart by Aldrich. *Leptocera* is, however, an older name for the same genus and must replace it in our lists as indicated by Coquillett in his paper on "The Type-species of North American Diptera."\(^\text{16}\) *Leptocera* was erected in 1813 and *Limosina* in 1835. There is a single species represented in the present material.

*Leptocera limosa* Fallen.

*Copromyza limosa* Fallen, Dipt. Suec., Heteromy, 8, 6 (1820).

Three specimens that evidently belong to this species were taken by G. D. Hanna on St. George Island; two bear the label Lot No. 2, and one Lot No. 11, the former being taken along with *Borborus annulus*, June 4, 1914, "on wet soggy ground near the Village landing," and the latter, June 10, 1914, "near beach at East landing."

Bremi found the larvae in conifers in Europe (Schiner).

Aldrich records the species in his Catalogue from New Jersey, White Mountains, N. H., and Montreal, Canada. I have taken the species in Illinois and it is probably of general occurrence in the United States.

Family PHYCODROMIDAE.

The members of this family resemble very closely the genus *Borborus* in general habits and have, by some of the older authors, been treated as belonging to the same family under the name Copromyzidae. In addition to resembling them in appearance they also have very similar habits, feeding mainly upon decaying vegetable matter, but I have never found species of *Coelopa* away from the seashore or the shores of a tidal river while *Borborus* and other genera of that family may be met with in almost any locality where a suitable pabulum is obtainable. *Coelopa* is the only genus so far recorded

from North America. Of the three species recorded two are con-
sidered as identical with two of those occurring in Europe and those
are the species represented in the present collection.

Genus *Coelopa* Meigen.

*Coelopa frigida* Fallen.  
*Copromyza frigida* Fallen. Dipt. Suec., Hydrom., p. 6, 1820.  
*Coelopa frigida* Zetterstedt, Dipt., Scand., vol. 6, p. 2472, 1847.  
*Coelopa simplex* Haliday, Ent. Mag., vol. 1, p. 167, 1833.

This species is represented by 28 specimens in the collection. The
data upon the labels are as follows:

**St. Paul Island.**
- 7 specimens, August 19, 1914 (E. A. Preble).
- 1 specimen, August 1, 1914 (E. A. Preble).
- 5 specimens, summer, 1914 (E. A. Preble).
- 2 specimens, summer, 1914 (lot 210, A. G. Whitney).
- 1 specimen, May 23, 1914 (lot 150, A. G. Whitney).
- 3 specimens, August 16, 1914 (G. D. Hanna).

**St. George Island.**
- 2 specimens, June 16, 1914 (lot 35, G. D. Hanna).
- 1 specimen, June 17, 1914 (lot 42, G. D. Hanna).
- 3 specimens, June 14, 1914 (lot 19, G. D. Hanna).
- 3 specimens, May 6, 1914 (G. D. Hanna).

*Coelopa eximia* Stenhammer.  

This species is represented by 13 specimens in the collection. All
were taken on St. Paul Island and bear the following data:
- 1 specimen, May 23 (lot 154, A. G. Whitney).
- 2 specimens, August 1 (E. A. Preble).
- 2 specimens, August 19 (E. A. Preble).
- 1 specimen, summer, 1914 (lot 210, A. G. Whitney).
- 4 specimens, August 16, 1915 (G. D. Hanna).
- 2 specimens, August 16, 1915 (G. D. Hanna).
- 1 specimen, July 7, 1917 (G. D. Hanna).

There has been considerable confusion in this genus because of
misidentification by various authors in the early part of the nine-
teenth century. Schiner probably had his synonymy more exact than
any previous author and his names have been accepted by the present
writer.

Coquillett recorded *frigida* and *nitidula* Zetterstedt from Alaska.\(^{17}\)  
This *nitidula* is the species I record as *eximia*. Hagen has recorded
*frigida* from Massachusetts,\(^{18}\) and Coquillett has recorded it from

the Commander Islands.\(^{10}\) Cole records (Proc. Calif. Acad. Sci., 4th ser., vol. 11, p. 174, Nov. 1921), *C. parvula* Haliday from St. Paul Island, June 8 and 21, 1920 (G. D. Hanna). This also is the species listed here as *eximia*.

A key for the separation of the three North American species is given herewith as there is no previous synopsis available to students which includes all three.

*Key to North American species of Coelopa.*

1. **Males**
   
2. **Females**

2. Legs without strong bristles, covered with long woolly hairs, those on hind tibiae very conspicuous; cheeks rather densely covered with soft hair, not bristly
   
   Femora and tibia with numerous strong bristles; cheeks with numerous bristles which are shorter posteriorly

3. Mid tibiae with numerous strong bristles on entire surface except ventrally, the ventral surface with moderately long soft hairs; hind tibiae with slightly stronger bristles than mid pair; bristles on hind femora extending to base
   
   Mid tibiae with very long woolly hairs especially on ventral surface, only 2–3 bristles present on apical half of anterior surface; hind tibiae with very conspicuously stronger armature than mid pair, the bases of bristles slightly tuberculate; bristles on hind femora confined to apical half (Cresson, Calif.)

4. Fore and hind femora and tibiae with conspicuous bristles
   
   Fore and hind femora and tibiae without conspicuous bristles

5. Cheeks and fore femora with uniform soft hairs
   
   Cheeks bristly; fore femora with soft hairs, conspicuous among which are several longer, moderately strong bristles on the antero-dorsal surface

*Family SCIOMYZIDAE.*

There is one species in the collection that in certain respects resembles some of the species in the family Helomyzidae, but which because of the absence of the vibrissae and of the costal spines must be placed in the Sciomyzidae. It agrees with no described genus in the latter family, so that I am forced to erect a new genus for its reception.

The larvae of the Sciomyzidae, so far as I know them, are aquatic or live in damp earth, usually on the margins of streams or ponds, and feed upon decaying vegetable matter. There is nothing in the records pertaining to the present material that indicates the larval habits of the species, as they bear only the date of collection.

*Genus Pseudosciomyza, n. gen.*

*Generic characters.*—Frons broad; orbits with 3–4 bristles; postvertical bristles divergent; second antennal joint much shorter than

---

\(^{10}\) Rept. on Fur Seals and Fur Seal Islands, pt. 4, p. 345, 1899.
third; third joint distinctly longer than broad (arista missing)
face receding toward mouth margin; eye small, round, barely highe:
than cheek. Thorax with the following bristles: 1 humeral, 2 noto
pleural, 1 presutural, 2 pairs dorso-central, 1 prealar, and 2 postalar
scutellum with 4 bristles; propleurum with a bristle; stigmatal bris-
tle absent; mesopleura unarmed; sternopleura with numerous long
hairs none of which can be considered as bristles. Legs hairy, with-
out distinct bristles except those at apices of mid and hind tibiae, the
former stronger than the latter and noticeably curved. Costa un-
spined; inner cross vein before apex of first vein, sixth vein reaching
margin of wing. Genotype, the following species.

Pseudosciomyza hannai Cole.


Male.—Brownish black, subopaque, head yellowish brown; vertex
and occiput with dense grayish pruinescence; frons orange brown,
darker posteriorly; orbits pruinescent; face and cheeks testaceous
yellow; third antennal joint slightly brownish. Thorax with rather
dense yellowish gray pruinescence. Abdomen more brownish than
thorax, the surface slightly shining and with but little pruinescence;
apices of segments narrowly yellowish. Legs reddish brown; femora slightly darkened. Wings faintly yellowish, noticeably so on
each side of humeral vein and between apices of auxiliary vein and
first; cross veins with very indistinct yellowish marginal suffusion.
Halteres pale yellow.

Frons slightly over half the width of head; orbits slightly differen-
tiated, each with 3–4 bristles which are directed slightly outward;
center stripe with numerous black, setulose hairs; antennae rather
short, not descending much below level of eyes; face slightly carinate,
upper mouth margin arched; labrum small, protruded tongue-like;
proboscis fleshy; palpi rather broad, hairy; disc of thorax with
numerous long setulose hairs among which it is difficult to distinguish
the bristles; sternopleurum with long hairs on its entire surface.
Abdomen with long and rather strong hairs on all segments; hypo-
pygium rather large, knob-like. Legs stout, the femora noticeably
so, hairy; tarsal claws long. Wings elongate, their length exceeding
that of insect from head to tip of abdomen, and equal to 3 times
their greatest width; first costal division about 1.5 that of second,
the two combined exceeding in length that of third; second vein
ending well in front of wing tip; third vein ending very close to
apex of wing; inner cross vein about three sevenths from apex of
discal cell; last section of fourth vein about 1.5 that of penultimate
section.

Female.—See Cole’s description (op. cit.).
Length, 5 mm. St. Paul Island, 4 specimens, August 19, 1914 (E. A. Preble); 1 specimen, August 1, 1914 (E. A. Preble).

This genus has the clypeus well developed and protuberant, and because of this character, runs to the subfamily Dryomyzinae in Melander’s recent key to the genera of Tetanoceridae. It is separable from Helcomyza Curtis by the absence of costal spines and the mid tibial bristling and from the other two genera by the lack of posterior bristles on mid tibiae, and bristling of scutellum and dorsum of thorax.

This genus and species have been in manuscript since 1915, but the species was described by Cole from material collected on St. Paul Island August 20, 1920. The author of the species indicated that its position in the genus Dryomyza, in which he placed it, was doubtful, which is correct.

Family TRYPETIDAE.

The species comprising this family are phytophagous in the larval stage; feeding in stems, roots, leaves, flowers, or fruits, and giving little or no indications of their presence, while others make their presence evident by the formation of galls upon the roots or stems, or by causing large blotches upon the leaves within which they feed. There is in the collection before me one species which appears to be undescribed. Loew has recorded Spilographa flavonotata Macquart, and Tephritis angustipennis Loew from the Yukon River, Alaska; and Coquillett in addition to describing Trypetia flaveola from Commander Islands has recorded species from Canada and northern and western States of the Union, some of which may occur in Alaska, but it is very improbable that any of them will be found on the islands covered by the present investigation because of their connection with certain food plants which do not occur on these islands.

Genus Acidia Robineau-Desvoidy.

The genera Acidia and Spilographa are in my opinion not validly separable. The only difference between the genotypes, which I have examined, lies in the arrangement of the thoracic dorsocentral bristles. In Acidia the four bristles in front of the scutellum are more nearly in a transverse line than they are in Spilographa. The very faint distinction between the wing markings of the two so-called genera is too trivial to warrant their generic separation.

I retain the generic name Spilographa in the references to species in the following paragraph as it is under that name that the species have been recorded in the literature.

The European Spilographa alternata Fallen lives in rose hips, some of the genus live in fruits of Berberis, while S. zoe Meigen and S.
artemisae Fabricius in the larval stages mine in leaves of Artemisia and allied plants. The North American species electa Say, is found in the larval stage in berries of Solanum carolinense. The larval habit of the species before me is not known but it is undoubtedly a phytophagous species.

Acidia uncinata Coquillett.

_Puparium_ (Pl. XV, fig. 37).—Length 4.5 mm., diameter at middle 2.25 mm. Color, pale yellowish white, slightly shining. Surface of segments very minutely transversely rugulose, appearing except under a high magnification as entirely smooth. Dorsal thoracic segments as in Plate XV, Figure 33, the second and third with small scutellate setae on their anterior margins arranged in short, slightly curved, transverse series. All segments each with a slightly irregular transverse series of very small, rounded, raised areas which are rather widely separated and each of which is armed at apex with a weak hair. Apex of abdomen as in figure 35; spiracles slightly elevated, each with 3 rather conspicuous, black, slits (Pl. XV, fig. 35).

_Imago._—Male: Brownish testaceous, shining. Head including antennae and palpi pale yellowish testaceous, center stripe of frons opaque, darker than face, lower orbits subopaque, upper orbits and triangle shining. Thorax and abdomen distinctly shining, the former with slight yellowish pruinescence; humeri paler than disc of thorax; postnotum with a large blackish spot on each side. Legs yellowish testaceous. Wings with blackish or brownish markings as follows: A brown spot beyond humeral vein, a similarly colored spot filling the space between apex of auxiliary vein and apex of first vein and extending posteriorly as far as second vein but not connecting on the disc with the fusiform spot covering the inner cross vein, the latter extending in an almost straight line to costa, filling the entire cell to apex of second vein and distinctly indicated along the anterior margin of the cell between second and third veins, apex of wing infuscated, outer cross vein enclosed in a brown suffusion. Hairs and bristles black.

Upper frontal orbits elongated, their lower extremities extending beyond apex of ocellar triangle; lower orbits each with 3 bristles; eye about 1.5 times as high as long; cheek about one-sixth the height of eye. Thoracic chaetotaxy normal. Fore femora with ventral bristles, the other pairs unarmed; hind tibiae without dorsal setulose, only a few weak hairs present. First and third wing-veins setulose, the latter with setulae extending well beyond inner cross vein; apex of third vein very noticeably curved backward; inner cross vein at less than one-third from apex of discal cell.

Length, 4.75 mm.

Lot 35 in list is given as “Found dead on moss and liverwort specimens from Tolstoi Hill.” Lot 163, “Grassy bankside near Village wells. One cocoon and fly. These yellow, ribbed cocoons found everywhere in lower part of moss beds and among their roots; a moist location.” Lot 103 “On Coelopleurum. These pupae common everywhere under and amid thick damp moss on tundra all through the summer season.”

The cocoons referred to are the puparia of this trypetid. It seems remarkable that the puparia should be so very common as stated above and that only 2 flies are in the collection.

The puparium of this species has a very well defined lateral fusiform area, a character that one might in a measure associate with the family Ortalidae if Bank’s paper on the larvae of Diptera were used as a guide to the identity of this stage. It is therefore pertinent to point out that the paper in question provides only characters for the identification of such species as might reasonably be expected to occur in the stomach of man as accidental introductions with food and is not intended to cover the entire Muscoidea. A number of species in Ortalidae have no clearly defined lateral fusiform areas and the anal stigmatical areas are not noticeably elevated, while some Trypetidae have both distinct lateral fusiform areas and more or less elevated anal stigmatical areas.

Family SEPSIDAE.

The members of this family so far as they are known live in decaying animal or vegetable matter or in preserved foods or meats. The only genus represented in the present collection is Piophila.

Genus Piophila Fallen.

Of the species in this genus one at least is of economic importance because of its common occurrence in cheese and preserved meats. The larvae are able to leap short distances and the species is popularly known as the Cheese Skipper (Piophila casei). This species, which probably originated in Europe, has been found in human graves and is distributed throughout the whole of Europe, and North America from Alaska to Mexico. Several other European species occur in North America. One of the species in the present collec-
tion was found in the skull of a dead seal, and in this connection it may be of interest to record that several species are found in carcasses of dogs and other animals that are not uncommon on the shores of rivers, especially near the sea, in Britain. One species I have taken in such situations I have met with nowhere else.

**Piophila anomala, n. sp.**

*Larva.*—Not preserved. Cephalopharyngeal skeleton as in Plate 15, Figure 36; dissected from puparium.

*Puparium* (Pl. XV, fig. 31).—Length, 3.5–4 mm. Reddish brown, slightly shining. Surface with fine transverse rather irregular rugae (fig. 31). Anterior respiratory organs very small. Segmentation rather indistinct. Posterior spiracles with 3 rather indistinct slitlike openings; apex as in Plate XV, Figure 32. The entire body without distinguishable hairs or setulae.

*Imago.*—Male and female.—Glossy black. Head, with the exception of the upper portion of frons, the occiput and anterior portion of cheeks, reddish yellow; palpi yellow; third antennal joint brownish. Legs black, yellow on extreme bases and apices of all femora, the bases of all tibiae and basal 3 joints of mid and hind tarsi. Wings clear, veins yellowish. Calyptrae whitish. Halteres yellow.

**Male.**—Frons distinctly narrowed anteriorly; orbits each with 2 bristles, the anterior one weaker than the posterior; disc of frons with a few weak hairs; second antennal joint with a rather long apical dorsal hair, third joint rounded; arista indistinctly pubescent; vibrissa as long as arista; cheek nearly half as high as eye. Mesonotum with 2 dorso-centrals; scutellum with 4 bristles. Hypopygium small. Legs rather stout, fore tarsi not appreciably thickened. Venation normal.

**Female.**—Agrees in color with the male. Ovipositor long and slender.

Length, 3.75 mm.

*Type.*—St. George Island, July 4, 1914 (Lot 52; G. D. Hanna); toward Zapadni Rookery. Allotype and puparium, St. Paul Island (Lot 176, A. G. Whitney). The data attached to this lot is as follows: "Near Village. One fly and several pupa cases. The pupa cases were found June 14 in the interstices of the nasal bones of a fur seal skull on the ‘killing field.’ From these one fly hatched out June 20.” Paratypes, St. George Island, 2 specimens, August 4, 1914 (G. D. Hanna); St. Paul Island, 1 specimen, August 19, 1914 (E. A. Preble).

This species differs essentially from others in the genus in having the frontal orbits each with 2 distinct bristles. *P. casei* Linnaeus usually has the frons much darker and only exceptionally have the
orbits any hairlike setulae. The disc of thorax in *anomala* is glossy black, with a slight bluish tinge, and the surface has rather uniform short hairs. In this respect the species agrees closely with *nigriceps* Meigen, but the latter has the face blackened and the scutellum flattened and transversely rugulose. The scutellum in *anomala* is convex and smooth. *P. casei* differs from both *anomala* and *nigriceps* in having the thorax subopaque, with 3 slight longitudinal grooves in which there are a series of short hairs, the remainder of disc being bare and with a slight olivaceous tinge.

The foregoing notes are drawn from a comparison with North American specimens of *casei* and *nigriceps* named by Coquillett. I have no European examples of the species.

Since the completion of the manuscript of this paper a revision of the family has appeared by A. L. Melander and A. Spuler. The species described herein will run down to *oriens* Mel. and Spul. in their key to species of *Piophila*, but the legs are differently colored in my species, the fore coxae in *anomala* being mostly black and the mid and hind tibiae largely blackened, whereas in *oriens* the fore coxae and mid tibiae are entirely yellow and the hind tibiae and the tarsi less broadly blackened, all of the mid tarsi and the basal 4 joints of the hind pair being yellow.

There is a narrow dorso-central stripe on abdomen of *anomala* which is transversely rugose; no mention is made of this in description of *oriens*.


*Piophila* sp.

A female taken by G. D. Hanna, June 16, 1914 (lot 36), on St. George Island, differs from the foregoing in having the antennae black; the cheeks higher, rugose posteriorly; the humeri and center of scutellum slightly reddish; and the legs darker. Unfortunately there is but one poorly preserved example, so I refrain from giving it a name.

In several respects the specimens agree fairly well with the description of *pilosa* Staeger, a species recorded from Greenland. The male of *pilosa* is distinguished from allied species by the rather conspicuous short pilosity, which is especially noticeable on the abdomen, and by the black antennae and very dark legs. The female is less noticeably pilose. *Nigerrima* Lundbeck, a species described from Greenland, differs from all others so far described in being entirely black.

Family EPHYDRIDAE.

The species of this family are aquatic in habit, the larvae being found in liquids or in mud. Some few species are met with in the larval stage as miners in stems or leaves of aquatic or marsh plants. The species in the present collection are similar to those that frequent moist ground, and in all probability the larvae will be found in the wet mud or water about which the adults occur. Many of the species are flower frequenters in the adult stage.

Genus Scatella Robineau-Desvoidy.

This genus contains a large number of species which are met with even more commonly in the Old World than in the New. The great majority of the species so far described have the wings either with dark spots on a clear ground or clear spots on a dark ground. The species in the present collection differs from these groups in having the wings unspotted. Scatella setosa Coquillett and S. stagnalis Fallen, the two species recorded from Alaska, belong to the group with clear spots on the wings.

Scatella brunnipennis, n. sp.

Male and female. Subopaque brown. Face, yellowish brown, much paler than frons, the latter greenish anteriorly in well preserved specimens, cheeks and lower part of back of head slightly gray dusted. Thorax slightly shining on disc anteriorly in well preserved specimens with bluish or greenish luster, entirely opaque on pleura; mesonotum without distinct vittae, abdomen brown, slightly shining at base, becoming glossy on second segment and noticeably polished towards apex, the whole with a distinct bronzy reflection. Legs, brownish black, femora with slight grayish pruinescence. Wings subfuscous, unspotted; veins, dark brown. Halteres brown or yellow.

Frons seen from above over 3 times as wide as either eye; 2 strong orbital bristles on each side; center stripe above and orbits with a number of short setulose hairs; third antennal joint barely longer than broad; arista short, scarcely exceeding length of antenna, its pubescence very short; face very decidedly convex, with numerous short bristles, those on mouth margin and on a line with eye margin but some distance from it, most distinct; no string bristle on cheek. Humeral area with a few setae; notopleural bristles 2 in number; dorso-centrals 3, the anterior and middle pairs less widely separated than posterior pair, acrostichals in 2 regular, complete rows; dorso-central line filled in between bristles with short setulae; mesopleura
with 1 strong bristle and a number of hairs, those on posterior margin directed backward and those on upper margin directed upward; sternopleurum with 1 strong bristle; scutellum subtriangular, flattened on disc, anterior pair of bristles not very much shorter than posterior pair. Abdomen with sparse, short, surface hairs. Legs normal. Wings slightly longer than entire insect; distance from humeral vein to end of first vein barely more than one-fourth as great as next costal division; both costal breaks distinct; venation similar to that of *stagnalis.*

Length, 2–3 mm.

_Type locality._—St. Paul Island, August 16, 1915, 60 specimens (G. D. Hanna). Other paratypes as follows:

St. Paul Island.

11 specimens, August 1, 1914 (E. A. Preble).
15 specimens, August 19, 1914 (E. A. Preble).

St. George Island.

8 specimens, June 4, 1914 (lot 2, G. D. Hanna).
1 specimen, June 16, 1914 (lot 32, G. D. Hanna).

This species strongly resembles *quadrisetosa* Becker, differing, however, in the yellow instead of gray face and the absence of the strong metallic color of the lower part of the frons. *Quadrisetosa* is a Norwegian species that has not been recorded from this side of the Atlantic, except by Cole (Proc. Calif. Acad. Sci., 4th ser., vol. 11, Nov. 1921, p. 176) and of his specimens, which came from St. Paul Island June 21 and August 10, 1920 (G. D. Hanna) he says they "seem to answer the description of this form."

Genus *Parydra* Stenhammer.

A genus which is well represented in Europe and North America; the larvae live in stagnant water, and the adult flies are found in marshy situations.

*Parydra metallica* Cole. Pl. XV, fig. 26.


This species was in manuscript for several years in this paper, but has been described by Cole as above.

It is an aberrant species and may reasonably be removed from *Parydra,* but I do not consider it pertinent to do so in this paper.

Originally described from St. George Island, June 28, 1920 (G. D. Hanna). In the present collection it is represented by three specimens from the same island, June 4 and 16 (lots 2 and 36, G. D. Hanna).
Family DROSOPHILIDAE.

The known larvae of the species of this family feed upon decaying vegetable matter, exuding sap of trees, in fermenting liquids, and rarely in leaves of living plants.

There is a single species in the present collection.

Genus Drosophila Fallen.

Drosophila graminum Fallen.

_Drosophila graminum_ Fallen, Geomyzides, p. 8, 1823.

A female of this species taken on St. Paul Island, August 16, 1915 (G. D. Hanna), has the thoracic stripes well defined and in every respect agrees with the dark forms occurring in the United States.

Family AGROMYZIDAE.

There is but a single species of this family in the collection. It belongs to the genus Phytomyza, the species of which are, so far as known, phytophagous in the larval stage, usually mining in the leaves of various plants, or living in the froth of Cercopidae.

Phytomyza obscurella Fallen.

_Phytomyza obscurella_ Fallen, Phytomyzides, 4, 1823.

I have considerable doubt about the identity of this species. Melander has had an opportunity of comparing Alaskan and European examples of this species and considers the forms _illicicola_ Loew and _nigra_ Meigen as varieties of _obscurella_, listing both as occurring in Alaska. The recorded food plants of the varieties suggest confusion of species—_illicicola_ on holly, _obscurella_ on honeysuckle and elder, and _nigra_ on _Primula veris_ and _Heracleum sphondylium_. In view of the facts that I have no European examples of _obscurella_ for comparison and that I have no record of the food plant of the Alaskan species and have not had opportunity to compare the larvae and pupae of the different forms, I leave the matter as it is, merely calling attention to the element of doubt in the matter of the recorded occurrence of _obscurella_ in Alaska and the sinking of _illicicola_ and _nigra_, as varieties of _obscurella_.

There are 7 examples that I place under this species name provisionally. The data are as follows:

St. George Island.

3 specimens, June 16, 1914 (lot 32, G. D. Hanna).
4 specimens, August 16, 1915 (G. D. Hanna).
Agromyza parvicella Coquillett.

This species was originally described from St. Paul Island, but no specimens were found in the present collection.

Immature Stages of Diptera.

Suborder Orthorrhapha.

Division Nematocera.

Family CHIRONOMIDAE.

There are a few specimens of larvae of Chironomidae in alcohol, brief descriptions of which are appended.

Genus Chironomus Meigen.

Chironomus sp. 1.

Length, 10–12 mm. Color in life red. Head about 1 1/2 times as long as broad, tapered anteriorly, eye spot duplicated; antennae 5-jointed, basal joint about 4 times as long as its diameter, second joint as long as diameter of basal, third joint about as broad as long, much shorter than fourth and subequal in length to apical joint; labrum with 4 long hairs on each side of center anteriorly, the downward projecting margin with fine teeth; transverse comb consisting of 9 rather large rounded teeth; mandibles with 3 large dark teeth and a subapical dorsal and median paler pair; labrum similar to that of decorus Johannsen. Anal ventral blood gills absent; anterior and posterior pseudopods well developed; dorsal anal papillae large; each armed with about 6 long hairs.


The data for this lot are as follows:

About 10 larvae from mud of dried-up pond where Leucosticte had been scratching for them. This pond about one-quarter mile long and 18 inches deep was dry from August 5 to mid-September. During this time its whole mud bottom was scratched over by turnstones to get at these larvae which were abundant. Color of the larvae ruby-red.

Genus incertus.

There are several larvae in the collection that I do not know the genus of. They differ from any larva known to me in having the apical abdominal segment armed with several concentric series of stout hooks, the area so armed being but slightly elevated and resembling that present on larvae of Simuliidae. The head, however, is of the normal Chironomid type and there is no possible doubt as to its relationship with that family. The head is short and broad, slightly tapering anteriorly; the antennae are of moderate length, the basal joint short and stout, not twice as long as its diameter, the

second very slender, about one-third as thick as basal and about one-third longer than it, apical portion consisting either of one joint or 2 very closely fused, the length of which is about equal to the diameter; apex of basal joint with a stout process which tapers appreciably apically and is as long as second joint; mandibles with 5 teeth; labium with a large rather irregularly rounded central tooth and a much smaller rounded one on each side; labrum with 2 pairs of stout protruded ventral processes.

Length, 4—6 mm.

St. Paul Island.

7 specimens, March 23, 1913 (lot 5, A. G. Whitney).
1 specimen, April, 1913 (lot 10, A. G. Whitney).

The specimens in lot 5 were found in the bottom of a bag in which willows and mosses had been collected. It is possible that this is the larva of *Smittia* but more data are necessary before a reliable opinion can be expressed.

**Family LIMNOBIIDAE.**

Among the alcoholic material in the collection there is a larva that has puzzled me considerably. The head is complete and in most respects resembles that of members of the Mycetophilidae, having the typical very short antennae, apically subtruncate, toothed mandibles, and tapering dorsal cephalic plate. Were I judging from the head alone I should undoubtedly place the species in the Mycetophilidae but the respiratory system to all appearance is confined to prothoracic and anal spiracles, the apical abdominal segment has 4 distinct finger-like protuberances, and the whole of the body is covered with soft decumbent hairs, characters that associate it in my mind with *Trichocera* of the Limnobiidae, usually considered a subfamily of the Tipulidae.

In the absence of pupae and imagines of this species it is not possible for one to place it definitely, as our knowledge of the early stages of the order, although increasing slowly, is not such that we can identify more than a mere fraction of the species in the larval stage.


Found along with some chironomid larvae in the bottom of a bag in which willows and mosses had been collected.

**Suborder Cyclorrhapha.**

**DIVISION SCHIZOPHORA.**

**Family CALLIPHORIDAE.**

A single example of a large calliphorid puparium is in the collection. As no examples of the adults of this family are before me I
can not attempt to associate it with any species. Muscids are treated in the paper following.

Length, 11.5 mm. Reddish testaceous. Cephalic and caudal extremities slightly tapering; segments well differentiated; anterior margins of segments with very short spines; lateral fusiform area narrow; spiracles with straight slits which open almost directly laterad, disclike basal elevation not distinguishable; margin of spiracular area elevated so that the spiracles are in a cavity; spiracular field with 12 distinct tubercles on margin, 6 above, the largest being the inner and outer pair in top row and the 2 outer on each side of bottom row; anal opening with a large conical protuberance on each side.

St. Paul Island: May 1, 1913 (lot 17, A. G. Whitney).

EXPLANATION OF PLATES XII-XV.

Plate XII.—Flies (Cyclorrhapha).

Fig. 1. Coelopa frigida (male). Fig. 2. Pogonota kincaidi (male).

Plate XIII.—Details of Flies and Midges (Nematocera and Brachycera).

Fig. 3. Sciara glacialis, hypopygium of male, apical portion of one side.
Fig. 4. Sciara sp. Same as Figure 3.
Fig. 5. Smittia arctica, hypopygium of male, one side.
Fig. 6. Chironomus obtusilobus. Same as Figure 5.
Fig. 7. Smittia arctica, antennae of male.
Fig. 8. Smittia arctica, antenna of female.
Fig. 9. Allodia subelata, hypopygium of male, one side.
Fig. 10. Orthocladius obumbratus, hypopygium of male, apex of dorsal plate.
Fig. 11. Tanytarsus similatus. Same as Figure 10.
Fig. 12. Smittia arctica, wing of male, with more enlarged section of costa.
Fig. 13. Chironomus conformis, hypopygium of male, superior process and apex of lateral arm.
Fig. 14. Exechia casta, hypopygium of male, one side.
Fig. 15. Rhamphomyia opacithorax, hypopygium of male, lateral view.
Fig. 16. Chironomus deviatus, hypopygium of male, one side; a, apex of superior process.

Plate XIV.—Details of Flies (Cyclorrhapha).—Figures 17-21, apical ventral abdominal plate of males; Figures 23-25, hypopygia.

Fig. 17. Scatophaga stercoraria. Fig. 18. Scatophaga dasythrix.
Fig. 19. Scatophaga crinita.
Fig. 20. Scatophaga rubicunda.
Fig. 21. Scatophaga islandica.
Fig. 22. Scatophaga furcata.
Fig. 23. Scatophaga furcata.
Fig. 24. Scatophaga stercoraria.
Fig. 25. Coelopa eximia.
FLIES (CYCLORRHAPHA).

Fig. 1. Coclopa frigida, male.  Fig. 2. Pogonota kincaidi, male.
DETAILS OF FLIES AND MIDGES (NEMATOCERA AND BRACHYCERA).

(Explanation on page 226.)
DETAILS OF FLIES (CYCLORRHAPHA).
(Explanation on page 226.)
DETAILS OF FLIES (CYCLORRHAPHA).

(Explanation on page 227.)
Plate XV.—Details of Flies (Cyclorrhapha).

Fig. 26. *Parydra metallica*, head.
Fig. 27. *Borborus subapterus*, wing.
Fig. 28. *Allomyella brevipennis*, head.
Fig. 29. *Helina hannai*, anal opening of puparium.
Fig. 30. *Helina hannai*, apex of puparium, end view.
Fig. 31. *Piophila anomala*, puparium, dorsal view.
Fig. 32. *Piophila anomala*, end view.
Fig. 33. *Acidia uncinata*, puparium, dorsal view of thoracic segments and respiratory organs; a, opening of latter enlarged; b, spines of segments, enlarged.
Fig. 34. *Hydrophoria alaskensis*, abdomen of male, lateral view.
Fig. 35. *Acidia uncinata*, apex of puparium, end view, and spiracular slits enlarged.
Fig. 36. *Piophila anomala*, larval head parts.
Fig. 37. *Acidia uncinata*, puparium, lateral view.
DIPTERA.

Suborder Cyclorrhapha.

Division SCHIZOPHORA.

Family CALLIPHORIDAE.


Cynomyia hirta Hough.

This species was originally described from St. Paul Island by Hough. It has also been recorded from Popof Island and Kodiak, Alaska, by Coquillett. It closely resembles C. mortuorum Linn. of Europe, but is evidently distinct.

The specimens before me exhibit a considerable variation in size, i. e., 10–16 mm. They were collected on both St. George and St. Paul Islands from June 24 to August 26.

Calliphora vomitoria Linnaeus.

This species has been recorded by Coquillett as occurring in Alaska as follows: Sitka, Kukuk Bay, Popof Island, and Seldovia. This is the species mentioned in the list of Diptera as Calliphora obscoena Esch. in the report on the Fur Seal Islands.

It inhabits also northern Europe, Canada, and the northeastern portion of the United States. Specimens were collected on both St. George and St. Paul Islands, from July 3 to September.


Cole records (Proc. Calif. Acad. Sci., 4th Ser., vol. 11, p. 171, 1921) Didyma pullata van der Wulp from St. Paul Island. There is no such species, but evidently pullula van der Wulp is intended. Van der Wulp’s species, which is not a Didyma, is recorded from Mexico; and Coquillett’s record of it from Alaska is erroneous. In all probability, therefore, the species does not occur in the Pribilofs.—J. R. M.
HYMENOPTERA.

By Henry L. Viereck, Assistant Biologist, Bureau of Biological Survey.

In the following list, records of the species with a reference letter are taken from published reports and those without a reference letter are here published for the first time. Where the type locality of a species is in these islands the species is preceded by an asterisk (*).

Suborder Chalastogastra.

Superfamily Tenthredinoidea.

Family Xyelidae.

Megaxyela?

Determined by S. A. Rohwer. One head from St. Paul Island, from the stomach of Arquatella pilocnemis, No. 14119.

Family Tenthredinidae.

* Amauronematus isolatus Kincaid. (b)


* Amauronematus whitneyi Rohwer.

Type.—St. Paul Island, Bering Sea, April 15, 1914. 1 9, A. G. Whitney, Lot 122.

Amauronematus sp.

Determined by S. A. Rohwer. Probably the same as the preceding. St. Paul Island, May 27, 1915, from the stomach of Sertcorarius longicaudus (No. 135031, Biological Survey stomach collection).

Pachynematus gotarus Kincaid.

Determined by S. A. Rohwer. 3 9 4 9, St. George Island, June 27, 1914 (G. Dallas Hanna), 2 9, both Lot 49; and 2 9, one, Lot 49; one, Lot 21.

Pachynematus sp.

One male “does not seem to be described.” Determined by S. A. Rohwer. St. George Island, June 14, 1914 (G. Dallas Hanna).

Pteronidea melanostoma Rohwer.

_Type._—St. George Island, Bering Sea, June 14, 1914. 1♀ G. D. Hanna (Lot 21; Lot 12 according to original description).

_Dolerus konowi_ MacGillivray.


_Dolerus sp._

Determined by S. A. Rohwer. 1♀, St. Paul Island, summer, 1914. (E. A. Preble.)

Suborder Clistogastra.

_Superfamily Ichneumonoidea._

_Family Vipionidae._

*Apanteles (Protapanteles) alticola_ Ashmead. (*)

*Apanteles (Protapanteles) congestiformis_, n. sp.

_Type locality._—St. Paul Island, May 29, June 20, 1913 (A. G. & E. G. Whitney, lot No. 50), cocoons collected May 29, 1913.

_Female._—Length 2.5 mm. Related to _A. (P.) carduicola_ (Packard) and may prove to be at most a race of _A. (P.) congestus_ (Nees.), from which it differs in its mostly black fore femora. Shiny, partly polished, partly pale sericeous; head above mostly polished, indistinctly sculptured, face almost polished, finely indistinctly punctured, without a median welt, labrum blackish, basal half of mandibles black, the apical half mostly reddish, antennae black throughout except for the pale joint between the pedicel and flagel, palpi dark stramineous; thorax mostly closely punctured, the punctures shallow and adjoining or nearly adjoining, scutel almost impunctate, polished, sparsely punctured, posterior half of mesopleura mostly polished, impunctate, wings with a faint brownish tinge, almost colorless, stigma brownish stramineous, veins dull stramineous with a smoky tinge, transverse cubitus a little longer than the first ascissa of the radius, tegulae black, legs black or blackish except for the distal trochanter of the fore legs, the apical fourth of fore tibiae and all of the remaining tibiae and most of the tarsi which are rather pale brownish stramineous, end joints of the tarsi blackish as are the penultimate and antepenultimate tarsal joints of the fore and mid legs, metapleura with the anterior half mostly polished, the posterior half not nearly so coarsely reticulated as propodeum; propodeum shiny, rather coarsely reticulated and with a distinct median longitudinal carina; abdomen with its first and second plates more or less sculptured, the first plate finely wrinkled, partly indistinctly punctured, partly longitudinally striate, second plate not so definitely
sculptured, the succeeding tergites highly polished, abdomen black throughout, ovipositor hardly exserted.

*Allotopotype.*—Essentially as in the type, except that the legs are black or blackish throughout except for the yellowish annulus near the base of the tibiae. Cocoons imbedded in a mass of pale lemon-tinted floss.

Family **ALYSIIDAE**.

*Gyrocampa alaskensis* Ashmead (°)

Family **BANCHIDAE**.

*Enizemum tibiale* (Cresson) (°)

Family **BRACONIDAE**.

*Ichneutes reunitor* Nees.

Two specimens from St. George Island, June 14, 16, 1914, (G. Dallas Hanna, lots 22 and 36.)

Family **ICHNEUMONIDAE**.

*Monoctonus paulensis* (Ashmead) (°) (=*Aphidius*).

Many specimens from St. George Island. One, April 7, 1914 (emerged apparently from an empty aphid skin preserved with this specimen) (A. G. Whitney, lot 120); the remaining specimens were collected June 4, 10, 16, 1914, and are labeled, respectively, G. Dallas Hanna, lots 2, 11, 28, and 32.

*Aphidius propinquus* Ashmead (°) (=*A. frigidus* Ashmead).

Five specimens from St. George Island, June 10, 16, 1914, August 16, 1915 (G. Dallas Hanna, lots 11, 12, and 32).

*Praon alaskensis* Ashmead (°)
*Catastenus alaskensis* Ashmead (°)
*Catastenus trifasciatus* Ashmead (°)
*Mesochorus frontalis* Ashmead (°)
*Campoplegidea laticinctus* Cresson (°)
*Hypocryptus variegateipes* Ashmead.
*Cteniscus clypeatus* Cresson (°)
*Polyblastus glacialis* Ashmead (°)
*Mesoileus stejnegeri* Ashmead (°)
*Calliphrurus minor* Ashmead (°)
*Calliphrurus affinis* Ashmead (°)
*Calliphrurus clypeatus* Ashmead (°)
*Tryphon alaskensis* Ashmead (°)
*Stenomacrus borealis* Ashmead (°)
*Stenomacrus sp.*
Two specimens from St. George Island, June 16, 17, 1914 (G. Dallas Hanna, lots 32, 37).

Stenomacrus sp.

One specimen from St. George Island, July 8, 1914 (G. Dallas Hanna, lot 55).

*Orthocentrus nigritus* Ashmead[12]

*Atmetus insularis* Ashmead[12]

*Deleter flavifrons* Ashmead[12]

*Neuroteles dubiosus* Ashmead[12]

*Hypoleptus alaskensis* Ashmead[12]

*Synoplus pleuralis* Ashmead[12]

*Synoplus brevipennis* Ashmead[12]

*Lissonota alaskensis* Ashmead[12]

*Gelis obsesus* Ashmead[12] = (*Pezomachus*).

Gelis sp.

One female from St. Paul Island, August 31, 1914, from the stomach of *Pisobia aurita* (No. 134907, Biological Survey stomach collection).

*Gelis nigrellus* Ashmead[12] = (*Pezomachus*).

Atypical females representing at most perhaps only a dark variety of this species were collected as follows: St. George Island, June 8, 10, 1914 (G. Dallas Hanna, Lot Nos. 8 and 11, respectively); St. Paul Island, August 10, 1915 (G. Dallas Hanna).

Gelis sp.

One female from St. Paul Island, August 31, 1914, from the stomach of *Pisobia aurita* (No. 134907) represents a species presumably related to *G. posthumus* Foerster.

*Mesoleptus kincaidi* Ashmead[12] = (*Exolytus*).

*Mesoleptus niger* Ashmead[12] = (*Exolytus*).

*Mesoleptus perplexus* Ashmead[12] = (*Exolytus*).

*Xestophyes nigripes* Ashmead[12] = (*Xestophya*).


*Xestophyes polita* Ashmead[12] = (*Xestophya*).

*Polyrhembia sanctipauli* Ashmead[12] = (*Exolytus*).

Two specimens from St. Paul Island, August 31, 1914, from the stomach of *Heteroscelus incanus* (No. 134917, Biological Survey stomach collection).

Polyrhembia sp.

Three specimens from St. Paul Island, August 31, 1914, from the stomach *Pisobia aurita* (No. 134907, stomach collection).
Seleucus sp.
One female from St. Paul Island, August 27, 1914, from the stomach of Arquatella philocnemis (No. 126723, stomach collection). Apparently not represented in any published key to species of this genus.

Bachia nigra Ashmead.

Bachia sp.

Scinacopus sp.

Zaphleges sp.
One male from St. Paul Island, August 16, 1915 (G. Dallas Hanna). Also presumably related to Phygaedon perfusor (Gravenhorst).

Plesignathus rubrocinctus Ashmead = (Plesiognathus).

Plesignathus sp.
One female from St. George Island, September 6, 1913 (G. Dallas Hanna). Presumably related to Phygaedon vagans Gravenhorst.

Plesignathus sp.
One male from St. George Island, September 6, 1913 (G. Dallas Hanna). Presumably related to Phygaedon brachyurus Thomson.

*Bathymetis simulator Ashmead.
*Bathymetis quadriceps Ashmead.
*Bathymetis confusa Ashmead.
*Bathymetis simillima Ashmead.

St. Paul Island, August 16, 1915 (G. Dallas Hanna) ; St. George Island, August 4, 1914 (G. Dallas Hanna.)

Bathymetis rubrocincta Ashmead.
*Bathymetis simulans Ashmead.
*Bathymetis imitator Ashmead.
*Bathymetis nigricornis Ashmead.
*Stiboscopus mandibularis Ashmead.
*Stiboscopus alaskensis Ashmead.
*Stiboscopus sanctipauli Ashmead.

Stiboscopus sp.

*Pezoporus trifasciatus* Ashmead\(^{(a)}\) = *Microcryptus*.

Stibeutes nigrita Ashmead\(^{(a)}\).

*Isochresta unicincta* Ashmead\(^{(a)}\).

*Theroscopus rufipes* Ashmead\(^{(a)}\).

*Habromma nigrum* Ashmead\(^{(a)}\).

*Aclastus rufipes* Ashmead\(^{(a)}\).

*Acrolyta aciculata* Ashmead\(^{(a)}\).

Caenomeris? sp.


*Spinolia minuta* Ashmead\(^{(a)}\).

*Centeterus dorsator* Ashmead\(^{(a)}\).

**Amblyteles** (*Pterocormus*) *alpestriformis*, n. sp.


*Female.*—Length 9 mm.; colored somewhat like *Pterocormus? disparilis* (Cresson), from the original description of which it differs as follows: Head reddish, except for the cheeks, malar space, and antennal basin, all of which are mostly black; mandibles reddish, blackish at base and apex; palpi fuscous; antennae blackish, except for the basal fourth, which is mostly reddish, without an annulus; apical third of antennae with the joints slightly faceted above; thorax with its tegulae stramineous, without a yellow line before and beneath; scutel and postscutel reddish; wings subhyaline, brownish; veins and stigma pale brownish stramineous; legs mostly reddish; coxae and trochanters mostly black; hind coxae reddish above; end joint of tarsi brownish; propodeum slightly concave posteriorly, without lateral angles; propodeal carinae well defined; areola wider in front than behind, nearly quadrate, slightly rounded, emarginate behind; areola rather indefinitely, coarsely sculptured; abdomen finely reticulated, its punctures mostly from adjoining to two puncture widths apart; second tergite apically, fifth basally, and third and fourth tergites broadly down the middle, black; second and third tergites without yellow spots; sixth and seventh tergites with a median yellow spot; post-petiole dullish, finely sculptured, almost impunctate.

*Other locality.*—St. George Island, August 4, 1914 (G. Dallas Hanna).
Amblyteles (Pterocormus?) cervulus Provancher

**SUPERFAMILY CYNIPOIDAE.**

Family FIGITIDAE.

Alloxysta alaskensis Ashmead

Alloxysta sp.

From St. Paul Island, August 15, 1914 (No. 126733).

Tetrarhapta alaskensis Ashmead

St. Paul Island, August 16, 1915 (G. Dallas Hanna).

**SUPERFAMILY CHALCIDIOIDEA.**

Family MYMARIDAE.

Anaphes sp.

Two specimens of a species 924 μ long and apparently related to A. hercules Girault, the largest North American species. St. George Island, Staraya Artel Rookery, June 17, 1914 (G. Dallas Hanna, Lot 37).

Family PTEROMALIDAE.

Eutelus confusus Ashmead

"Habrocytus capreae Swederus."

This is probably what is intended by Tridymus capreae L. in Schwarz’s report (Fur Seals and Fur Seal Islands, Part 3, p. 550, 1899).

Asaphes sp.

St. Paul Island, August 16, 1915 (G. Dallas Hanna).

Pterosema sp.


Family MISCOGASTERIDAE.

Stictomischus sp.

One female from St. Paul Island, August 16, 1915 (G. Dallas Hanna).

Terobia vulgaris Ashmead

**SUPERFAMILY SERPHOIDEA.**

Family CERAPHRONIDAE.

Lygocerus alaskensis Ashmead
Family BELYTIDAE.

*Zelotypa scutellata* Ashmead.(6)

Zelotypa sp.

From St. Paul Island, August 15, 1914 (No. 126733).

Family SERPHIDAE.

*Serphus nigripes* Ashmead.(6)

St. Paul Island, August 16, 1915 (G. Dallas Hanna).

Serphus sp.

St. George Island, August 4, 1914 (G. Dallas Hanna).

SUPERFAMILY APOIDEA.

Family APIDAE.

Bremus (Bremus) kincaidi Cockerell.

Many females and workers from St. Paul Island, as follows: Females, October 11, 1912 (A. G. Whitney, Lot 2); May 31, June 5, 1913 (A. G. Whitney, Lots 113 and 36, respectively); workers, July 23, 1913 (A. G. Whitney, Lot 95).

ARACHNIDA.

By Nathan Banks, Museum of Comparative Zoology. Harvard University.

(Plate IX, figs. 1-7—see p. 158.)

Suborder Acarina.

Family BDELLIDAE.

Bdella frigida Banks.
St. George Island, July 9.

Cyta brevirostris Koch.
St. Paul Island, April.

Family ERYTHRAEIDAE.

Erythraeus tonsus Koch.
St. Paul Island, July 19, on Lathyrus maritima.

Family PARASITIDAE.

Parasitus borealis Koch. (Pl. IX, figs. 5 and 7.)
St. Paul Island, May 16 and 19; May 23, on flies; June 26.

Macrocheles arcticus Kramer and Neuman.
St. Paul Island, May 23, in moss; September 13, on chickweed.

Family IXODIDAE.

Ceratixodes putus Cambridge.
St. Paul Island, July 4, on Rissa t. pollicaris, also May 17 and June 30; and St. George Island, Aug. 4.

Family ORIBATIDAE.

Galumna lucens Koch.
St. Paul Island, July 17, on chickweed; Sept. 13, on chickweed.

Oribatella borealis Banks.
St. Paul Island, July.

Notaspis serrifrons, n. sp. (Pl. IX, fig. 2.)
Yellowish, cephalothorax subtriangular, with large submedian lamellae, each ending in a long bristle, a pair of short apical bristles, superior bristles long and fine; pseudostigmatic organ short and capitate; the front margin of cephalothorax has a row of about 108731°—23—16

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15 sub-equal teeth. Abdomen nearly globose, without hairs; ventral apertures nearly circular, the genital fully twice its length in front of the twice larger anal aperture; coxal plate with two lines each side; legs short, with simple hairs.

Length .5 mm.
From St. Paul Island, July (Whitney).

Scutovertex nigrofemoratus Koch.
Numerous specimens from St. Paul Island, Aug. 16.

Hermannia reticulata Thor.
St. Paul Island, July.

Nothrus sp.
Young from St. Paul Island, June.

Lohmannia scabra Koch.
St. Paul Island, April 5; October on Erytrichium chamissonis.

Family TYROGLYPHIDAE.

Dermacarus sp. (Pl. IX, fig. 1.)
Hypopi from St. Paul Island, July 5, on Sorex pribilofensis.

Tyroglyphus whitneyi, n. sp. (Pl. IX, fig. 6.)
Hypopus.—Very similar to T. lundbecki Trag. from Greenland. The body, however, is not, or is only a trifle broader at humeri than at the hind coxae. The hind legs are situated only a little in front of the sucker-plate, and when extended behind reach fully to tip of the body. The plate is similar to that of T. lundbecki except that the median pair of suckers are very much larger than the others, in fact more than twice as large as any others. (Pl. IX, fig. 6.)
Length, .2 mm.
From St. Paul Island, on Bombus, May 31 (Whitney coll.).

Family LISTROPHORIDAE.

Myocoptes musculinus Koch.
St. Paul Island, November 16, on house mouse.

Family ANALGESIDAE.

Analges sp.
Females from St. Paul Island, April, without host.

Suborder Phalangida.

Family PHALANGIIDAE.

Leptobunus borealis Banks.
Common on both St. Paul and St. George Islands from the first of June till fall.
Suborder Araneida.

Family AEGELENIDAE.

Tegenaria derhami Scopoli.
St. Paul Island, May 11, and "Summer"; St. George Island, June 27.

Family THERIDIIIDAE.

Bathyphantes pogonias Kulczynski.
From St. Paul Island, July 3.

Microneta ululabilis Keyserling.
St. George Island, June 17 and September.

Erigone arctica White.
Several from St. Paul Island, summer.

Erigone psychrophila Thorell.
Several from St. George Island, July 4.

Erigone sp.
Two females from St. George Island, July 4, and August 4, another from St. Paul, August 17.

Hilaira glacialis Thorell.
From St. Paul Island, May 19; I give a figure of the male palpus.

Leptypantites sp.
One female St. George Island, August 4.

Ixodes arcticus, a tick parasitic upon the fur seal, was described from the Pribilof Islands by Herbert Osborn (The Fur Seals and Fur-Seal Islands of the North Pacific Ocean, Part 3, pp. 553-554, 1899).

Opinions differ as to the limits of the spider family Linyphiidae, and Dr. R. V. Chamberlin has published a paper on the "Linyphiidae of St. Paul Island, Alaska" (Journ. New York Ent. Soc., vol. 29, no. 1, pp. 35-43, pl. 3-4, March, 1921), in which he records 11 species. Five of these are described as new, in addition to 3 new genera.

Ctenicaria clavicornis Emerton.
Erigone sibirica Kulczynski.
Oedothorax septentrionalis Kulczynski.
Oedothorax nesides Chamberlin.
Aigola Chamberlin.
Aigola pauliana Chamberlin.
Aigola tuberella Chamberlin.

Anitsia Chamberlin.
Anitsia abjecta Chamberlin.
Arotiara Chamberlin.
Arctilaira bellana Chamberlin.
Tmeticus armatus Banks.
Microneta heathi Chamberlin.
Bathyphantes brevipes Emerton.

—W. L. M.

[For Plate IX (Arachnida) and explanation of plate, see page 158.]
CHILOPODA.

By RALPH V. CHAMBERLIN, Museum of Comparative Zoology, Harvard University.

No diplopod has been found on the Pribilof Islands and it is not likely that any occurs there naturally. Four species of chilopods, however, are natives of the islands, two of these being apparently abundant. One of these, the geophiloid *Linotaenia*, is widespread in North America from middle latitudes in the United States northward through Canada to Alaska and the adjacent islands, and, if not identical with, is certainly extremely close to, the widespread Eurasian species *Linotaenia attenuatus* (Leach). The northern specimens present certain differences from southern forms in both hemispheres as pointed out below. The lithobiid is apparently Asiatic in origin and does not conform generically to any truly North American genus as conceived by the writer. The other two species, both geophilomorphous forms, appear to be much less common. *Pachymerium ferrugineum* is a form widespread throughout the Eurasian and North American regions, having a range very similar to that of the *Linotaenia*; but the fourth species, the *Escaryus*, is thus far known from only a single specimen taken on St. Paul Island.

Lithobiomorpha.

Family LITHOBIIDAE.

*Ezembius*, gen. nov.

Body conspicuously narrowed cephalad; the first dorsal plate narrower than the head but wider than the second plate.

Head with marginal interruptions. Antennae short; articles normally twenty.

Ocelli in several series; single ocellus little if any larger.

Prosternal teeth 2+2 or 3+3; sinus V-shaped; ectal spines bristle-like.

Coxal pores circular; 3, 3, 3, 3, to 6, 7, 7, 6 in number.

None of the posterior coxae laterally armed; but two or more pairs commonly dorsally armed. Anal legs each with two tarsal claws. Ventral spines of anal legs normally 0, 1, 3, 2, 0; dorsal 1, 0, 3, 1, 0. Dorsal spines of penult legs 1, 0, 3, 1, 1. Tibiae of all legs excepting the anal dorsally armed, commonly the tibiae of the first two pairs bearing a single spine, the others caudad to the antepenult pair bearing two spines.

Tarsi in fully grown specimen more or less clearly divided.
Neither anal nor penult legs of male with a definitely developed process or lobe.

Claw of female gonopods short, trilobed, the lobes normally short and inconspicuous or the lobes obsolete and the claw entire or subentire; basal spines 2+2, slender.

Small and medium sized species.

Genotype.—Lithobius stejnegeri Bollman.

Among other species apparently congeneric with this type form is a group of Siberian species embracing, e. g., the following described by Stuxberg: ostiocrorum, princeps, sulcipes (see below), and scrobiculatus.

Ezembius stejnegeri (Bollman).

Lithobius sulcipes Bollman, loc. cit., p. 199, 1893.
Lithobius sulcipes Chamberlin, Canad. Ent., p. 290, 1911.

Of this species there are in the collection sent me for study by the Bureau of Biological Survey eight specimens from St. Paul Island, four of these being adult males, two adult females, and two young females in the immaturus stage, apparently differing by one moult.

There are also five adults from St. George Island (collected Aug. 4, 1914, by E. A. Preble). I have also studied several specimens of this form secured on St. Paul Island in 1910 by Prof. Harold Heath. In addition to the specimens from the Pribilof Islands, I have examined and compared material from Bering Island, the type locality, Copper Island, Popof Island, and other islands of the region. More recently I have received from the Bureau several additional specimens collected in the group by G. Dallas Hanna.

After a careful study I am unable to detect more than one species in the material from these localities, and am convinced that the sulcipes of Bollman, certainly the Monotarsobius arcticus of Attems, and the Lithobius (Archilithobius) haasei of Attems, all described from Bering Island, are one and the same as E. stejnegeri, which in turn may prove to be identical with L. sulcipes Stuxberg (1875), and likely with the much earlier L. sibiricus of Gerstfeldt (1858), later fixed by the description of Haase (1880). In the present note, however, I have given above only the synonymy of forms described or recorded from the islands in or adjacent to Bering Sea, and reserve the question of the Siberian species until more abundant material from that region can be studied. The M. arcticus of Attems is separated from stejnegeri for the single stated reason that the ventral spines of the anal legs of the latter species are given as 1, 3, 2, 6 instead of 1, 3, 2, 0, as in arcticus. The 6 in the first formula, as might
have been surmised, is clearly a misprint for 0, the types of *stejnegeri*
all having the formula for anal legs 1, 3, 2, 0, so that there remains
no evident ground whatsoever for maintaining *arcticus*. Attems re-
fers his specimens to Monotarsobius; but the tarsi in the larger
specimens of the species are quite clearly biarticulate, though in
smaller individuals the division in the anterior tarsi may not be dis-
tinct or may be but partial. *Lithobius* (*Archilithobius*) *haasei*
Attems was apparently based upon larger specimens of the same
species. For this form the prosternal teeth are given as 3+3, a
number occurring quite commonly in larger individuals from all the
localities above mentioned, while the number may be 3 on one side
and 2 on the other. The extra teeth appear on the border of the
median sinus and are at first smaller than the others. The claw of
the female gonopods is typically tripartite; but the lobes are short
and often are nearly or quite obliterated as such, leaving the claw
subentire or entire.

**Geophilomorpha.**

Family LINOTAENIIDAE.

LINOTAENIA CHIONOPHILA (Wood).


Of this species I have examined 22 females and 29 males collected
on St. Paul Island in 1910 by Prof. Harold Heath. Specimens from
Bering Island studied by Attems are by him recorded as *Scolioplanes
acuminatus* (Leach), a species well known in Europe. A specimen
from the same island is listed by Bollman as *L. chionophila* (Wood).
Specimens from Popof and Kadiak Islands and from Sitka and
Lower Inlet are likewise referable to Wood’s species. There is no
room for doubt that this northern form is the typical *chionophila*,
of which the type specimen, a female, was taken at Fort Simpson on
the Red River of the North [Fort Simpson is on Mackenzie River,
near Lat. 62° E. A. P.]. If Graf Attems is right in his identification
of the specimens from Bering Island, as there is not much room to
doubt, then the European form is one and the same as the North
American, and *attenuatus* of Leach must replace *chionophila* of
Wood as the specific name. In view of the different mode in number
of pairs of legs and a few other minor points, however, I believe it
as well to keep Wood’s name for the present and until the forms have
been more intensively studied as to variation and distribution, espe-
cially since such difficulty is often met in separating closely allied
species of *Linotaenia*. 
Of the 22 females from St. Paul Island 16 have 45 pairs of legs and 6 have 43. Wood's type has 43 pairs. Of the 29 males from St. Paul Island 27 have 43 pairs of legs, one has 45 pairs, and one has but 41 pairs. Attems states that among his specimens from Bering Island one male had 41 pairs and one 45 pairs, the others having 43. Thus it would seem that the numbers of pairs of legs in the male is almost constant at 43, individuals with 41 or 45 being occasional; while in the female the modal number is 45, variation to 43 being frequent.

In the case of the European specimens of *L. attenuatus*, the number of pairs of legs is nearly always smaller. In Austria-Hungary Latzel found among 60 specimens studied that all the males had 39 pairs while in the females the number was either 41 or 43. Meinert gives the number of pairs of legs as constantly 41, but gives the number in the female as 41 or 47 pairs, one specimen having the latter number. In "Die Myriopoden Stiermarks" Attems states that all the males studied by him from that country had 39 pairs of legs, excepting one which had 41, while all the females had 41. The same author, however, found among specimens from Transylvania four males with 37, two males with 35, and five with but 33 pairs of legs; and of females nine with 39, one with 37, and seven with 33 pairs of legs. It will be noted then that in European specimens of *L. attenuatus* the most usual number of pairs of legs in the male is 39 and that in some regions this number seems to be nearly fixed; but that in other places variation below this number may be frequent or the rule. Similarly the modal number for the female is 41, but variation is more frequent than in the male, the number sometimes being 43, or, in sections where the variation in the number in the male in the minus direction is frequent, falling to 37 and even to 33.

In the United States specimens of *L. chionophila* differ from the northern specimens and agree with the European *L. attenuatus* in having the number of pairs of legs in the male most frequently 39. In the female the number varies from 41 to 37. Of 22 females from Ithaca, N. Y., I find six to have 41 pairs, eight to have 39, and eight to have 37 pairs.

It may be noted that the number of coxal pores in specimens of *attenuatus* from Europe and specimens of *chionophila* from the United States averages considerably higher than in the specimens from the Pribilof and other islands of the region. Of the 22 females from St. Paul Island, eight have on each side six pores, five have five, five have seven, three have eight, and one has nine; of the males, sixteen have six pores, ten have five, two have seven, and one has eight. The mode is thus six pores on each side.
Family GEOPHILIDAE.

Pachymerium ferrugineum (C. L. Koch).


*Pachymerium ferrugineum* C. L. Koch, System der Myr., p. 187, 1847.


One specimen of this form was secured on St. Paul Island by the Harriman Expedition. It is probably not uncommon on the Pribilof Islands, since it is common both on the Asiatic and North American mainlands. It is a widespread and abundant species both in Europe and Asia and in North America.

Family SCHENDYLIDAE.

Escaryus albus Cook.

*Esaryus albus* Cook, Harriman Alaska Expedition, vol. 8, p. 77, 1904.

The type of this species, taken on St. Paul Island, is the only specimen thus far known.
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