intervention availed nothing. One day I opened the box as usual, and to my surprise found therein a small voracious grub which had already devoured about half of the hapless Lycosid. I had carried none of the wasp's nest material from the beach with the spider, and although I am told that these wasps are not known to attach the egg to the food supply, I can only suppose that in this case the egg was in some way fastened to the victim, and when it hatched out the grub began work at once on the food supply provided by the marvellous instinct of its mother. Next day there remained only the scattered legs of the spider, and a couple of days later, the grub itself, pining for the "optimum" conditions of its sandy nest, died also.

INSECTS IN OCEAN DRIFT.*

I. HEMIPTERA HETEROPTERA.

BY H. M. PARSHLEY, BUSSEY INSTITUTION, HARVARD UNIVERSITY.

Insects cast up by the waves are often found on the shores of bodies of fresh and salt water, as is well known to most collectors. Specimens found in this way are usually few and scattering, and their presence in the water is probably due simply to an unusually venturesome flight which may have carried them too far for a safe return to land. On rare occasions, however, much more extensive flights may occur, with the result that the shipwrecked are cast ashore in unbelievable numbers, sometimes forming a windrow for miles along the beach. This phenomenon is not to be explained in connection with the spring and fall flights when the air seems alive with insects on the wing, as it has been observed at various other seasons, and for the same and other reasons such flights do not appear to be nuptial in character. Sometimes a violent off-shore wind has been held accountable for the presence of the insects in the water, but this explanation will not fit the cases which I have observed; in fact, no satisfactory hypothesis has been advanced as yet. As a knowledge of the species concerned is important in the explanation of insect activity, I append a list of the Hemiptera Heteroptera which I have taken in ocean drift, leaving the list of the other groups for a later paper.

* Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 123.

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For several years I have spent the summer at Beach Bluff, Mass., during which time I have seen the phenomenon under discussion on only three occasions, each time in the afternoon: June 21, 1915, July 18, 1915, and Aug. 1, 1916. In each case there was a light on-shore breeze with fair weather, and in none was the occurrence preceded by an unusually violent off-shore wind, though on the day before the last a moderate land breeze was observed. The insects were not washed up in such enormous numbers as in the cases reported by Needham,* where the shore was blackened by them for miles, but nevertheless the stranded insects were very numerous, in some places forming a continuous line along the beach. The occurrences which I observed were remarkable for the large number of different species represented, with relatively few specimens of each, unlike some of the previously reported cases where the flotsam consisted largely of a single species in enormous numbers. As noted by J. R. de la Torre Bueno in his paper on the subject,† the collector finds in beach drift many species whose retiring habits ordinarily save them from capture, and in the following list are a number whose presence in the vicinity I had not suspected. All the specimens recorded below were taken from the sand immediately on being left by the waves, and I can thus vouch for the fact that all actually took part in the flights over the water. Those marked with an asterisk are mentioned in the list of ocean drift Hemiptera given by Bueno.

LIST OF SPECIES.

Scutelleridæ.

Eurygaster alternata Say, July 4, 1915.

Cydnidæ.

Thyreocoris ater A. & S., June 21, July 18. (2)

T. nitiduloides Wolff., June 21.

T. pulicarius Germ., June 21, July 18. (6)

Pentatomidæ.

**Podops cinctipes* Say, June 21.

**Mormidea lugens* Fab., June 21, July 18. (2)

Dendrocoris humeralis Uhl., July 18.

* Insect Drift on the Shore of Lake Michigan, Occas. Mem. Chicago Ent. Soc., vol. 1, No. 1, 1900.

Beetle Drift on Lake Michigan, Can. Ent., vol. 36, 1904, p. 294.

† Heteroptera in Beach Drift, Ent. News, vol. 26, 1915, p. 274.

Perillus exaptus Say, June 21.

**Apateticus cynicus* Say, July 18.

**A. bracteatus* Fh., Aug 1.

Lygaeidae.

**Lygaeus kalmii* Stal., July 18.

Ortholomus longiceps Stal., July 18.

**Nysius ericae* Schill., June 21.

**Ischnorrhynchus geminatus* Say, Aug. 1.

Cymus angustatus Stal., July 18.

C. discors Horv., June 21.

Geocoris bullatus Say, June 21. (6)

G. bullatus discopterus Stal., June 21. (2)

G. uliginosus speculator Mont., July 18. (3)

G. uliginosus limbatus Stal., June 21. (4)

**Ligyrocoris diffusus* Uhl., June 21, Aug. 1. (10)

Rhyparochromus plenus Dist., July 18, Aug 1..

These specimens seem to agree with the description and figure given by Distant in the *Biologia Centrali-Americana* of a form from Guatemala, but there is some question in regard to the generic reference. I have seen a specimen from Mt. Tom, Mass., and others have been found at Georgetown, Conn., and in the Huachuca Mts. Ariz. For most of this information I am indebted to Mr. H. G. Barber, who spares neither time nor trouble when called upon for assistance in some difficult question relating to the Hemiptera.

**Eremocoris ferus* Say, June 21, July 18. (11)

Piesmidæ.

Piesma cinerea Say, June 21.

Not found heretofore north of Rhode Island.

Tingidæ.

Corythucha marmorata Uhl., July 18.

C. sp. nov., June 21.

The description of this and several other new species of *Corythucha* will be published elsewhere.

C. cratægi Morrill, Osb. & Drk., Aug. 1.

Melanorhopala obscura Parsh., (*Psyche*, Vol. 23, 1916, p. 167) June 21.

Nabidæ.

**Nabis ferus* Linn., July 18.

Miridæ.

Miris dolabratus Linn., June 21. (2)

Platytyellus sp.?, June 21.

Neurocolpus nubilus Say, Aug. 1.

Pæcilocapsus lineatus Fab., July 18.

Capsus ater Linn., June 21. (4)

C. ater semiflavus Linn., June 21.

Camptobrochis grandis Uhl., July 18. (7)

Gerridæ.

**Gerris marginatus* Say, July 18. (4)

Saldidæ.

Saldula major Prov.

S. pallipes Fab., July 18. (2)

S. sphacelata Uhl., June 21.

S. opacula Zett., July 18.

S. sp.?, June 21, Aug. 1. (3)

**Micracanthia humilis* Say, June 21, Aug. 1. (9)

Some of these were taken under seaweed where they were very numerous on Aug. 1, though not so ordinarily. Stranded specimens were very active as soon as they left the water, and probably those under the seaweed had taken temporary refuge there after escaping the waves.

Corixidæ.

Corixa verticalis Fieb., July 18. (2)

Kindly identified by Prof. J. F. Abbott.

It is well known that some insects can withstand prolonged submergence in salt water, but from the condition of the more fragile species, many of which gained the shore alive, it seems to me probable that the flights occurred on the same day, shortly before the insects were washed ashore. If this be true, a possible explanation of the flights presents itself. On a clear day with a light, on-shore breeze the surface of the ocean reflects the sunlight with a peculiar sparkling brilliancy which might conceivably attract insects already flying above the land in unusual numbers because of some favouring combination of atmospheric conditions. The absence of the latter factor would account for the lack of a flight on days which were otherwise favourable. Thus, a light, on-shore breeze rather than a strong, off-shore wind may be the more frequent cause of the flight of insects over the water, and their consequent presence in the drift.