Literature Cited

BALOGH, J. 1961. Identification Keys of World Oribatid (Acari) Families and Genera. Acta Zool. 7(3–4): 243–344.

BANKS, N. 1895. On the Oribatoidea of the United States. Trans. Amer. Ent. Soc. 22: 1–16.

————. 1906. New Oribatidae from the United States. Proc. Acad. Nat. Sci. Phil. vol. 58 pp. 490–500.

BERLESE, A. 1910. Acari Nuovi. Redia 6: 200–234.

EWING, H. E. 1917. A Synopsis of the Genera of Beetle Mites with Special Reference to the North American Fauna. Ann. Ent. Soc. Amer. 10(2): 117–132.

JACOT, A. P. 1928. *Cepheus* (Oribatoidea), Especially in the Eastern United States. Trans. Amer. Micr. Soc. 47(2): 262–271.

DIURNAL AND NOCTURNAL LEPIDOPTERA OF BAY RIDGE WATERFRONT

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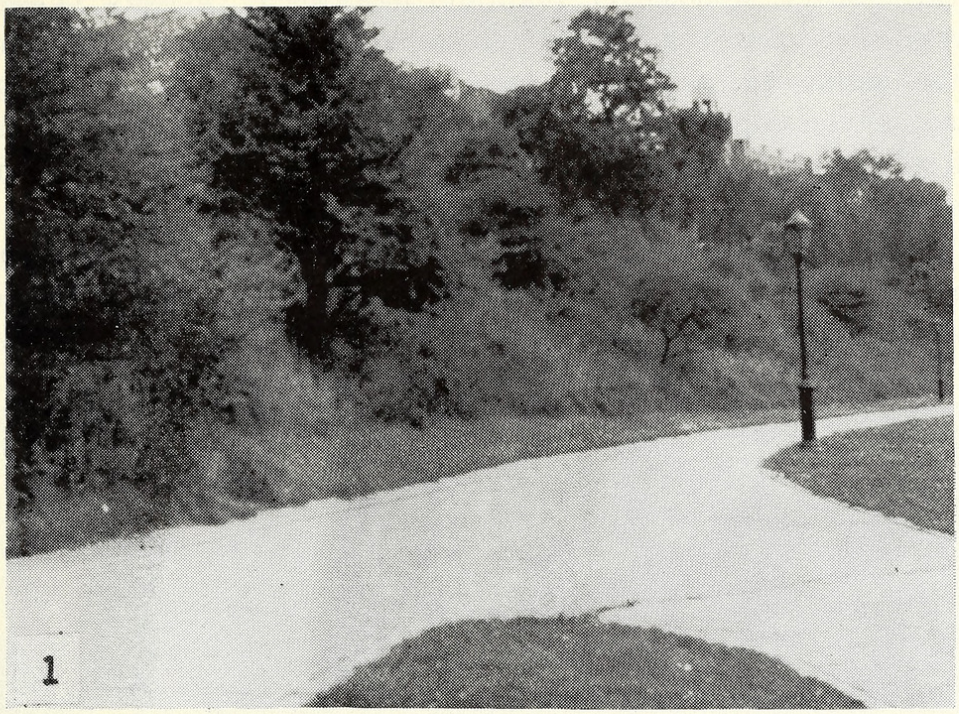
Abstract

A six year survey of a portion of the Brooklyn, waterfront traversed by the Belt Parkway, describes the topography, vegetation, and the lepidoptera netted or observed. Six families, 18 genera, and 27 species of butterflies; and 11 families, 40 genera, and 48 species of moths are reported together with field information. It is concluded that in spite of the cultivation of former waste land, and the encroachment of buildings, leaving little ground for wild vegetation, the lepidoptera persist as long as the respective food plants for their larvae have a chance of survival however precarious.

The area under consideration extends from 69th Street to the Narrows at Fort Hamilton in Brooklyn, New York. This winding stretch of shore line is about two and one half miles long, free of any docking facilities, and traversed by the New York Belt Parkway. Its direction runs true north to south, bordered on the west by the waters of New York Bay, and on the east by Shore Road, with an iron picket fence separating the region in its entire length from Shore Road with apartment houses and smaller dwellings at its eastern side.

The topography includes long expanses of grassy fields, gently inclined pathways, and sharply rising slopes fusing at the Narrows with the escarpments of Fort Hamilton which, at the present

time, have been pierced for the eastern anchorage of the new Verrazano-Narrows bridge to be erected at this site.

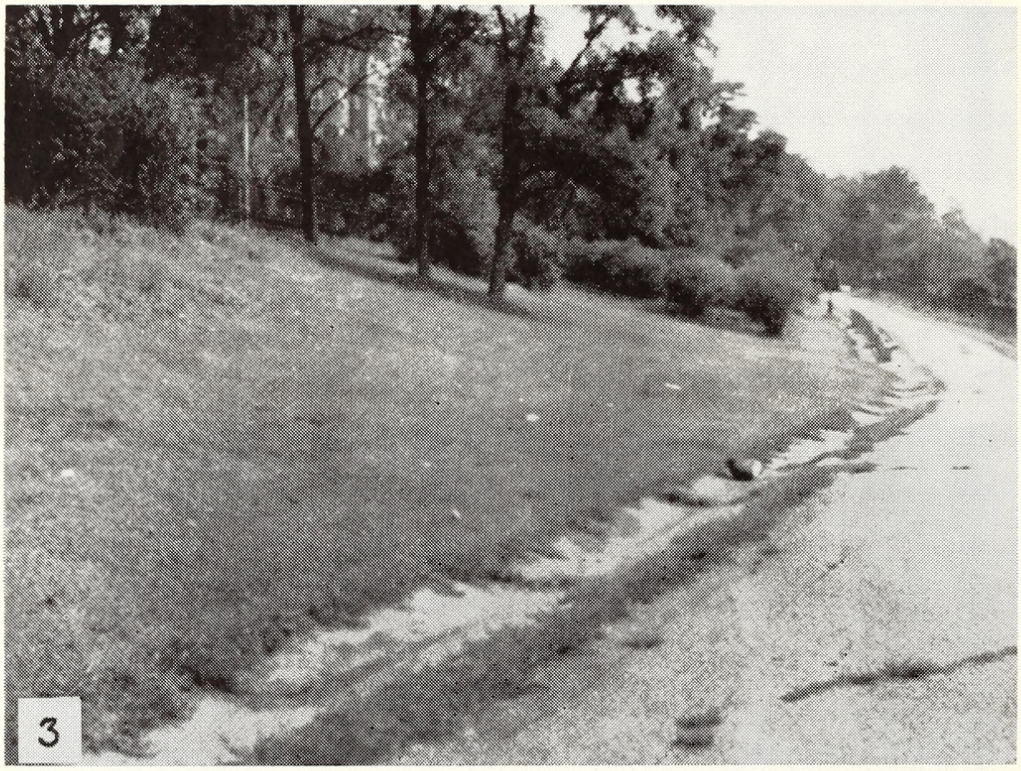


No. 1. View at 95th Street and Shore Road, looking south, and showing the abundancy of brush growth on the steeply rising slope.

No. 2. View at 90th Street, looking south, showing pathway leading to Shore Road with a steep slope overgrown with abundant vegetation.

During the summer months the wild vegetation consists of patches of white, red, and bush clover, dandelion, knotweed, self-heal, chicory, woodsorrel, plantain, hawkweed, yarrows, Queen-Anne's-lace, burdock, thistles; clusters of bladder and white campion, milkweed, and giant ragweed. Towards the end of the summer the slopes and the ridges are covered with various species of wild asters, daisy fleabanes, honeysuckle, pink morning-glory, hedge-roses, and goldenrod.

Amongst the trees and shrubs are elms, poplars, willows, aspen, linden, black oaks, hawthorns, mulberries, maples, sycamores, locusts, ailanthus' beachplum, privet, and forsythia.



No. 3. View at 85th Street, looking south, showing pathway with slope rising gently towards Shore Road.

All photos were taken during the last days of September 1962.

The entire area has been under my systematic and careful observation for six years (1955 to 1961) except for the summer months of 1958 which were spent in Europe. In spite of the continuous south and north-bound auto traffic along the Belt Parkway, the nearness of the towering apartment houses at the east side of Shore Road, and the close proximity of the Bay Ridge business district centered at 86th Street and Third, Fourth, and

Fifth Avenues, diurnal and nocturnal lepidoptera have tenaciously clung to this region of roughly cultivated parkland at the edge of a sprawling metropolis.

Most specimens mentioned in the following annotated list, except those tagged "observed," have been netted by me and are preserved in my private collection. Six families, 18 genera, and 27 species of butterflies; 11 families, 40 genera, and 48 species of moths are represented. In reference to taxonomy I have followed Klots (1951), in the case of Rhopalocera, and Holland (1937), in respect to Heterocera; the nomenclature for the latter, however, has been revised according to modern usage by Dr. Frederick H. Rindge, Associate Curator of Entomology at the American Museum of Natural History, New York.

I thank both Dr. Klots and Dr. Rindge for checking the assembled list against possible errors, and for several identifications that could not have been made by myself. To Dr. Louis Marks of the Biology Department of Fordham University I am indebted for the reading of the manuscript in its entirety, for helpful suggestions, and for his constant encouragement.

RHOPALOCERA

PAPILIONOIDEA

Danaidae:

Danaus plexippus Linnaeus

August, September, October 1955, observed only;
August, September, October 1956, observed only;
2 ♀, Oct. 4, 1957; ♂, Oct. 17, 1959; ♂ & ♀, Oct. 10, 1960; ♂ & ♀, Aug. 20, 1961, in copula; 2 ♂ & 2 ♀, Oct. 15, 1961, perfect specimens.

Throughout the six-year period Monarchs were observed in great numbers during the latter part of October, visiting wild asters and alighting frequently on pod-bearing milkweed along the slopes. Concentrations of these butterflies were seen one day, only to be gone the next. This leads to the conclusion that this paricular region is still being used as a flyway to the south for these migratory danaidae.

Nymphalidae:

Phyciodes tharos Drury

♂ & ♀, July 16, 1959; ♂ & ♀, Aug. 7, 1959; ♂ & ♀, Sept. 5, 1960, in copula; ♂ & ♀, Sept. 18, 1961, frequent.

Polygonia comma Harris

♂, July 29, 1956; ♂ & ♀, July 30, 1961.

Polygonia interrogationis Fabricius

♂ & ♀, July 30, 1956; ♂ & ♀, Aug. 20, 1959; 2 ♂ & ♀, June 17, 1960; many more specimens were observed that day at sundown flying high about elm trees and privet bushes.

Nymphalis antiopa Linnaeus

♀, July 9, 1961. The only specimen ever seen or caught in this region.

Vanessa atalanta Linnaeus

♂ & ♀, June 15, 1957; 2 ♀, June 25, 1959, small form; ♂ & ♀, July 17, 1959; ♀, Oct. 12, 1959, large form.

Vanessa cardui Linnaeus

♀, Sept. 28, 1957. No other specimens were ever observed or caught.

Vanessa virginiensis Drury

♂ & ♀, Sept. 5, 1959; ♂ & ♀, Oct. 6, 1959; ♀, Oct. 12, 1960; ♂ & ♀, Oct. 15, 1961, frequent.

Precis lavinia Cramer

♀, Oct. 3, 1959; ♂, Oct. 4, 1959; ♀, Oct. 6, 1959.

Lycaenidae:

Strymon titus Fabricius

♀, July 15, 1960; ♂ & ♀, July 20, 1961.

Strymon melinus Huebner

♂ & ♀, July 16, 1959; ♂ & ♀, Aug. 7, 1959; ♂ & ♀, Aug. 20, 1960. Frequent in the playing fields and on the slopes.

Strymon falacer Godart

♂ & ♀, June 21, 1957.

Everes comyntas Godart

3 ♂ & 2 ♀, Sept. 26, 1959; ♂ & ♀, Oct. 6, 1959; 2 ♂ & 2 ♀, Aug. 29, 1960; ♂ & ♀, July 4, 1961, in copula.

Abundant in the meadows, play grounds, and on the slopes; observed throughout the entire period.

Lycaenopsis argiolos pseudargiolos Linnaeus

♂ & ♀, July 6, 1955; ♀, June 11, 1959; 2 ♂ & ♀, June 18, 1960, observed many other specimens that day flying high about locust trees. All specimens listed are summer forms.

Papilionidae:

Papilio polyxenes asterius Stoll

♂ & ♀, July 17, 1959; ♂ & ♀, Aug. 7, 1959; ♂ & ♀, May 30, 1960; ♂ & 2 ♀, July 30, 1961; ♂ & ♀, Aug. 1961, in copula.

This rather tame swallowtail was observed in frequent numbers, almost abundantly, throughout the entire period. Several females were caught by hand and liberated again.

Papilio glaucus Linnaeus

♂, July 26, 1959, large, pale yellow form; ♂, June 17, 1960, small, pale yellow form; ♀, July 1, 1961, small ochrous yellow variation.

Several other specimens were observed in 1960 and 1961, flying high about elms, poplars, and locust trees.

Pieridae:

Colias eurytheme Boisduval

♂ & ♀, July 6, 1955; ♂ & ♀, Aug. 16, 1956; 2 ♂ & 3 ♀, Sept. 3, 1957; ♂ & ♀, Oct. 4, 1959; ♂ & ♀, Aug. 20, 1960; 2 ♂ & 2 ♀, Oct. 10, 1961; ♀, Aug. 7, 1959, white form; ♀ Sept. 6, 1959, white form.

The orange female form of these Sulphurs was in abundance throughout the entire period. This is the most common of all the butterflies in this region. Single specimens were observed as early as April 28th, and as late as November 15th. Some of the males show partial hybridization with *Colias philodice*.

Colias philodice Latreille

♀, Sept. 28, 1957; ♂ & ♀, Oct. 4, 1959; ♂ & ♀, Oct. 8, 1960; 2 ♂ & ♀, Sept. 30, 1961, frequent; ♂, Oct. 10, 1960, narrow bordered, colder weather form.

Eurema lisa Boisduval & Leconte

♀, Sept. 5, 1959; ♀, Sept. 19, 1959, very small and pale yellow; ♂, Oct. 12, 1959.

Pieris rapae Linnaeus

♂ & ♀, July 1956; ♂ & ♀, July 13, 1957; ♀, Oct. 4, 1957, a very small specimen; 2 ♂ & ♀, Sept. 26, 1959; ♂ & ♀, Oct. 12, 1960; ♂ & ♀, Aug. 15, 1961, in copula.

This species occurs in great numbers from early spring until the late fall.

Pieris protodice Boisduval & Leconte

♀, Oct. 4, 1957, a very dark checkered specimen; ♂ & ♀, June 11, 1960; ♂ & ♀, July 20, 1960.

HESPERIOIDEA

Hesperiidae:

Epargyreus clarus Cramer

♂, June 26, 1960; ♀, July 16, 1961; ♀, July 18, 1961.

Pholisora catullus Fabricius

♂, July 16, 1959; ♂ & ♀, July 17, 1959; ♂ & ♀, July 15, 1960; ♂ & ♀, Aug. 3, 1961. Quite frequent along the pathways and roadsides. Observed throughout the entire period.

Hylephila phyleus Drury

♂, Oct. 6, 1959; ♂, Oct. 8, 1959; ♀, June 15, 1959.

Poanes zabulon Boisduval & Leconte

3 ♂, June 17, 1960; 2 ♂ & 2 ♀, June 8, 1961.

Poanes hobomok Harris

2 ♂, June 15, 1959; ♂, June 17, 1960.

Panoquina ocola Edwards

♀, Oct. 6, 1959; ♀, Oct. 17, 1959.

The last four species occur infrequently and sporadically along the slopes of this region.

HETEROCERA

Sphingidae:

Phlegethonthius sexta Johanssen
♂, July 5, 1955; ♀, July 7, 1956; ♂, July 8, 1959.
Atreides plebeja Fabricius
♂, July 12, 1961.
Sphinx chersis Huebner
♀, July 17, 1956; ♂, July 18, 1956; ♂, July 19, 1956; ♀, July 6, 1959; ♂, July 9, 1959.
Pholus satellitia pandorus Huebner
♂, July 18, 1956.
Pholus achemon Drury
♂, July 19, 1956; ♀, July 13, 1957.

All sphingidae have been caught on the wing hovering over bladder-campion at dusk between 7:00 and 10:00 p.m. Since their larvae's favorite food plants: potato, tomato, and grapevine, are still plentiful on Staten Island, a mile and a half acoss New York Bay, these hawkmoths must be considered roving visitors from that region.

Saturniidae:

Samia cynthia advena Watson
♂, May 28, 1957; caught on the wing at dusk.

Eight cocoons were found Jan. 15, 1955. 3 ♂ & 5 ♀ emerged May 1 to 17, 1955. Four cocoons were obtained Nov. 2, 1959; ♀ emerged Jan. 14, 1961, ♀ emerged May 27, 1961, 2 ♂ emerged May 15, 1961. These cocoons were exposed to a cold temperature of 13° to 15° F. in a home refrigerator from Aug. 27 to Dec. 12, 1960.

Hyalophora cecropia Linnaeus

♂ & 2 ♀, July 12, 1955. They were found newly emerged on the picket fence. None were encountered ever since.

Antheraea polyphemus Cramer

♀, July 1, 1955, much damaged and worn out.
♂, June 27, 1957, a perfect specimen.

On Aug. 24, 1959, a fully grown larva was found on a maple trunk, it spun its cocoon the same day, ♂ adult emerged April 17, 1960.

Ctenuchidae:

Scepsis fulvicollis Huebner
♂, Sept. 3, 1956; ♀, Aug. 25, 1960; ♀, July 20, 1961.

The last two specimens were caught in the late afternoon on goldenrod.

Arctiidae:

Halisidota tessellaris J. E. Smith
♂, June 29, 1955; ♀, June 27, 1957; ♂, June 15, 1960.
Diacrisia virginica Fabricius

♀, July 29, 1956; ♀, Sept. 3, 1956.

Hyphantria cunea Drury

♂ & ♀, June 28, 1957; ♂ & ♀, July 15, 1957.

Noctuidae:

Acronicta americana Harris

♂, Aug. 24, 1955; ♂, June 11, 1957; ♀, July 10, 1959; ♀, June 17, 1960; ♀, July 1, 1961.

Acronicta lobeliae Guenée

♂, Aug. 16, 1959

Orthodes vecors Guenée

♀, Oct. 29, 1960.

Hyppa xylinoides Guenée

♂, Apr. 22, 1960.

Amphipyra pyramidoides Guenée

♂, Aug. 6, 1961; ♂ & ♀, Aug. 10, 1961.

Prodenia ornithogalli Guenée

♀, Oct. 23, 1959.

Graphiphora c-nigrum Linnaeus

♀, Aug. 24, 1959.

Pseudaletia unipuncta Haworth

♂, July 10, 1956; 2 ♀, Aug. 3, 1959; ♂ & ♀, Sept. 4, 1960; ♂ & ♀, Sept. 15, 1961. Abundant during August and September throughout the entire period.

Lithophane laticinerea Grote

♀, Nov. 9, 1960.

Lithophane lamda thaxteri Grote

♂ & ♀, Oct. 8, 1960.

Enargia infumata Grote

♂ & ♀, July 2, 1955; ♂ & ♀, July 3, 1955; 2 ♂, Oct. 13, 1957.

Pyreferra hesperidago Guenée

♀, Oct. 1, 1960.

Heliothis zea Boddie

♂ & 2 ♀, Sept. 26, 1959, netted during day time in high, dry grass.

Autographa biloba Stephens

♀, July 8, 1957.

Autographa precationis Guenée

♂, June 29, 1955; 2 ♂, July 12, 1956; ♂ & ♀, Aug. 3, 1957; ♀, Aug. 12, 1959; ♂ & ♀, July 5, 1960; ♂ & ♀, Aug. 8, 1961.

This species flies during the day time visiting various flowers, mostly white clover. Abundant throughout the entire period.

Autographa bimaculata Stephens

♂, July 3, 1960.

Anagrapha falcifera Kirby

♂, Aug. 28, 1960.

Caenurgina erechtea Cramer

♂, July 30, 1959; ♀, Oct. 23, 1959; 2 ♀, Oct. 30, 1960; ♂, Aug. 15, 1961.

Catocala dejecta Strecker

♀, Aug. 12, 1961, caught at rest on picket fence.

Catocala amatrix Huebner

♂, Sept. 15, 1956; ♀, Sept. 22, 1956; ♀, Sept. 19, 1957.

All three specimens were caught at rest on poplar trunks.

Catocala unijuga Walker

♀, Sept. 9, 1956, caught at rest on maple trunk.

Catocala ilia Cramer

♀, July 1, 1959.

Zale lunata Drury

♂, June 29, 1955; ♂ & ♀, Aug. 15, 1957.

Epizeuxis americalis Guenée

♀, Oct. 3, 1960.

Lasiocampidae:

Malacosoma americana Fabricius

♂ & ♀, June 15, 1957; ♂ & ♀, June 6, 1960; 2 ♂ & 2 ♀, June 8, 1960. These moths were taken in the day time from the picket fence and from various tree trunks. At night an invasion of hundreds of specimens occurred in the near-by business district flocking to neon signs and lighted show windows. The invasion lasted from June 6 to June 10, 1957. A full scale repetition of this occurrence took place from June 8 to June 11, 1960, a minor one from June 5 to June 10, 1961.

Geometridae:

Alsophila pometaria Harris

3 ♂, Nov. 11, 1959; 2 ♂, Nov. 15, 1960, 4 ♂, Nov. 17, 1960; 5 ♂, Nov. 11, 1961. Obtained from various tree trunks, picket fence, and house walls. From Nov. 8 to 17, 1960, and Nov. 9 to 14, 1961 large numbers of these male *pometaria* were observed on show windows in the business district during day time. Wingless females were never obtained nor observed.

Physostegania pustularia Guenée

♂, July 3, 1961; ♀, July 5, 1961.

Caripeta divisata Walker

♂, Aug. 5, 1961; ♀ Aug. 8, 1961.

Haematopis grataria Fabricius

♂ & ♀, July 16, 1959; 2 ♂ & 2 ♀, July 25, 1960.

In abundance, flying at dusk in high grass; observed large numbers throughout July 1961.

Psychidae:

Thyridoperyx ephemeraeformis Haworth

Winged males were never caught in the open. "Bags" with wingless and legless females were obtained during the latter part of August, and the first two weeks in September during the entire period. Some females were found entirely free of their pupal shells, others were still partially or wholly enveloped by their pupal cases with merely a slit-like opening at the anterior end. Abundant on young locust and hawthorn trees.

Aegeriidae:

Sylvora acerni Clements

♂, July 15, 1956; ♀, June 20, 1957; ♀, July 1, 1959.

All specimens were obtained during day time resting on flowers.

Pyralidae:

Eustixia pupula Huebner

♂ & ♀, July 3, 1960; ♂ & ♀, June 30, 1961.

These micro-moths were found resting on tree trunks, benches, and the picket fence. At night they flocked to the lighted show windows of the business district in large numbers.

Pediasia trisecta Walker

♂ &♀, July 6, 1960; ♂ & ♀, June 30, 1961.

Agriphila vulgivagellus Clemens

♂, July 3, 1960; 2 ♂ & 2 ♀, June 30, 1961.

Archips argyrospila Walker

♂ & ♀, June 28, 1959; ♂ & ♀, June 23, 1960; 2 ♂ & 2 ♀, June 30, 1961.

On this date an unusually strong invasion of large numbers was observed in the business district, covering neon signs and lighted show windows.

Pterophoriae:

Oidaematophorus monodactylus Linnaeus

2 ♂ July 7, 1961; ♀, July 10, 1961. All specimens were caught during day time resting on blades of grass.

All species of moths, not designated differently, were obtained by chance near of under the park and street lights which dimly illuminate this section at night.

Conclusion

The list of rhopalocera from this region may be fairly complete. For the list of heterocera, obviously, completeness cannot be claimed since new species may show up at any time. However, my survey purports to give a representative count of the lepidoptera one may encounter in this fringe territory. It is surprising to know that in spite of a certain cultivation of former waste lands, and the encroachment of building constructions which leave very little ground for wild vegetation, a hardy breed of lepidoptera will persist as long as the respective food plants for their larvae have a chance of survival.

Literature Cited

KLOTZ, ALEXANDER B. 1951. A Field Guide to the Butterflies. Houghton Mifflin Co., Boston.

HOLLAND, W. J. 1937. The Moth Book. A Popular Guide to a Knowledge of the Moths of North America. Doubleday, Doran & Co., Garden City, N. Y.