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THE ANTS OF THE KILDEER PLAIN AREA OF OHIO

(HYMENOPTERA, FORMICIDAE)[1]

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This paper consists of a description of the Kildeer Plain, a list of the varieties of ants found, and some notes in regard to their habits of nesting as observed in this area.

Wherever variations in the geological conditions of a region occur, there are found corresponding differences both in the flora and fauna. The climatic conditions including temperature, precipitation, etc., may be quite similar, yet there appear an amazing number of different habitats for living organisms. The very fact that one type of soil is composed of clay while another is composed chiefly of sand or the fact that here may be good drainage while at some distant point may be none at all, certainly determines in no small measure the type of organism which will exist or fail to find desirable environment.

This is true on a large scale across the entire width of the continent, on a smaller scale in the separate states and still more minutely, within the counties themselves.

The species of ants found in the Kildeer Plain Area of Ohio are of particular interest to the myrmecologist, for here is a small area which geologically is unusual in the state.

The following list embracing twenty-seven species, subspecies and varieties is undoubtedly incomplete. Ants have been taken from as many varied habitats as a small plain area presents. They have been taken in a dense oak-hickory forest at the edge of the prairie, on sloping banks of the Tymochtee Creek, along roadsides, in open prairie fields, many of which have not been under cultivation for five or six decades, and open fields that are again being put under cultivation. In the last mentioned instance, the newly plowed furrows were carefully examined for species which otherwise might have been overlooked.

The collections were made chiefly during the summer months of 1938 and the spring of 1939.

Due to the fact that there is no extreme environmental difference within this area, comparatively few species are found, but some of these appear in great abundance, for example: *Formica cinerea neocinerea*, which is known as a prairie ant. Some species living here are not very common elsewhere in the state, and some species commonly found elsewhere are prevented from living in this area abundantly because of the limiting characteristics of the region.

DESCRIPTION OF LOCALITY

The Kildeer Plain area is located mostly in the south central portion of Wyandot County between Tymochtee Creek on the west and the village of Harpster. It extends also into a small section of northwestern Marion County. The area is approximately nine miles in length (east and west) and six miles in width (north and south). Its entire western and most of its southern boundary is determined chiefly by Tymochtee Creek.

[1]The writer expresses sincere appreciation to Dr. C. H. Kennedy, under whose guidance and stimulation the work has been done, and to Dr. Mary Talbot who has given so freely of her time, particularly in the checking of identifications. Gratitude is extended also to Dr. Earl L. Core for identifications of the flora of the region and to Dr. J. Ernest Carman who has given valuable assistance in the comprehension of the geology of this plain area.

This plain is one of several found in the state. It is high in comparison with the altitudes of Ohio, its average elevation being almost nine hundred feet, with a general slope toward the north. It is situated in the Ohio-Erie Divide or the Wabash Terminal Moraine Region, and, being in the midst of this great water shed of the state and slightly on the northern slope, there are no large streams. The chief drainage, of which there is little, is the Tymochtee Creek and its tributaries. Just a little farther to the north are the headwaters of the Sandusky River. The general course of both of these streams is due north, toward Lake Erie.

The soils of this area are composed chiefly of three types: Miami silt, Clyde loam and clay loam. H. W. Olson, in studying the soils of this county as a habitat for earthworms, finds the organic content of the soil to vary from 3.5 per cent to 5 per cent, which is considered a high content. The pH of the soils ranges from 7.40 to 8.40, and the moisture content is found to vary, during normal conditions, from 15 per cent to 32 per cent. One conclusion can be drawn immediately from these observations, i. e., that variations in the flora and fauna are not restricted by the lack of organic material in the soil. It is also to be noted that there is considerable change in the moisture content from time to time.

Since the soil in this restricted area is chiefly of a fine texture, it is generally present in one or the other of two extreme conditions: either too wet or too dry. These conditions are not conducive to the healthy growth of flora, particularly of trees. Miss Thompson[2] states, "The affinities of the flora of any region are the product of past geologic and climatic history and of present edaphic and climatic conditions." Fauna, and particularly the type in which we are here interested, is certainly restricted by the lack of certain plants and again encouraged by the presence of others which may be found on the prairie.

The climate for this small area is apparently no great limiting factor in determining the presence of the ants found here, because the climate is consistent with that throughout the state. The mean annual temperature for Ohio ranges from 49° F. in the north to 53.5° F. in the south. Rainfall is abundant over all the state, increasing only slightly in the north.

The ant population of this section is determined both directly and indirectly by past geologic conditions: directly, by the type of soil itself, and the poor drainage; indirectly, by the growth of flora and fauna which is here due to these conditions.

Prairies are chiefly of two distinct types: high and low. The low prairie has been formed from a depression in the moraine region. At various times of the year it is covered with water. The high prairie was formed from depressions or small lakes which have been filled in. It is moist, but above water.

It is generally accepted that the Kildeer Plain is one of the latter type. With the slope of the plain slightly to the north and the recession of the terminal moraine, there apparently was not enough drainage to carry away all the moisture. As the moraine receded farther, the moisture was allowed to drain off and the shallow lake bottom became filled by the slow accumulation of vegetable matter, and perhaps by the washing in of adjacent land and fine soil.

The flora of this plain area will be discussed briefly for two reasons: (1) because it has a direct bearing upon the fauna, and (2) because it, too, is of a different nature than that found over most of the state.

As far back as 1835 the peculiarities of the plant and animal life were noted by Cyrus P. Bradly in his journey from Marion to Sandusky, for he writes, "I shall never forget my ride across the gloomy, unhealthy prairies which produce nothing but long grass, horned cattle, disease, mosquitoes and rattlesnakes. One species

[2]Thompson, Isabel. 1939. Geographical Affinities of the Flora of Ohio. The American Midland Naturalist. Vol. 21, No. 3, May, page 730.

of meadow grass was shown to me which is given the singular cognomen of Roman Catholic Grass." (*Hierochloë odorata* (L.) Beauv.).[3]

There is much evidence to prove that in earlier times prairies were more numerous and continuous than they now are. This gave opportunity for prairie species to spread, and it seems quite probable that some of the plants found on this prairie now have spread in from the west. Some of the species of plant life here are found only on isolated prairie patches such as are represented by the Kildeer Plain.

The oak-hickory forest on the edge of the plain is typical except that the area is extremely humid. Parts of the forest floor are entirely covered by jewel weed (*Impatiens biflora* Walt.)[4] At the edge of the forest the following plants are in evidence: water plantain (*Alisma plantago-aquatica* L.), button-bush (*Cephalanthus occidentalis* L.), wild yellow lily (*Lillium canadense* L.) and sensitive-fern (*Onoclea sensibilis* L.).

Scattered here and there throughout the plain area is the cotton wood tree (*Populus deltoides* Marsh). This tree is found typically, bordering streams and moist places, and here too, it finds favorable conditions for growth.

A few of the remaining typical plants in the Kildeer Plain are:

Hairy Milkweed.....(*Asclepias pulchra* Ehrh.)
Sulivant's Milkweed.....(*Asclepias sulivantii* Engelm.)
Sallow Sedge.....(*Carex lurida* Wahl.)
Spear Thistle.....(*Cirsium lanceolatum* (L.) Hill)
Squirrel-tail Barley.....(*Hordeum jubatum* L.)
Slender Rush.....(*Juncus tenius* Willd.)
Wing-angled Loosestrife.....(*Lythrum alatum* Pursh.)
Flat-stemmed Blue Grass.....(*Poa compressa* L.)
Virginia Rose.....(*Rosa virginiana* Mill.)
Dark green Bulrush.....(*Scirpus atrovirens* Muhl.)
Fringed Yellow Loosestrife.....(*Steironema ciliatum* (L.) Raf.)
Western Ironweed.....(*Vernonia fasciculata* Michx.)

Western Ironweed is recorded for Ohio only in two counties: Erie, which borders Lake Erie, and Wyandot, the county in which Kildeer Plain is located. Sulivant's Milkweed is an illustration of plant life which occurs in isolated prairie patches.

All of the plants here recorded are typical of one of the following situations, each of which is closely allied to the other: roadside, meadow, moist meadow, prairie, swamp margin, swamp and wet woods. Such are the conditions found in Kildeer Plain.

HYMENOPTERA—FORMICIDAE

Subfamily PONERINAE

This group is listed first because it represents the most primitive of all the *Formicidae*, and it may well be that the Ponerines represent the ancestral stock of the more highly specialized subfamilies. Its species are found in greater abundance in the tropic than in the temperate zone. Some species of *Ponerinae* are found quite frequently, but even then, their nesting sites are much more inaccessible than those of other species.

The colonies are small and the nests are always found in well-protected, damp places such as decaying wood and damp soil which may be found under rocks and boards.

[3]Sears, P. B. 1926. The natural vegetation of Ohio. Ohio Jour. Sci., 26, page 137.
[4]Identification of the flora of the region by Dr. Earl L. Core of West Virginia University, Morgantown, West Virginia.

The subfamily *Ponerinae* is easily recognized by the presence of a distinct constriction between the first and second segments of the gaster and also of a large, well developed sting.

Genus **Ponera** Latreille

Ponera coarctata subsp. **pennsylvanica** (Buckley).

Ponera pennsylvanica Buckley. 1866. Descriptions of new species of North American Formicidae. Proc. Entom. Soc. Phila., 6: 171. (Worker.)

Workers and males of this ant were taken both in the woods and in the open field. Workers were found under bark and in partially decayed oak. The males, with a few workers, were found in August in the deep hummock of a prairie field. The colonies of this slender species of ant are very small. There are seldom more than forty or fifty workers with five to fifteen pupae during brood rearing.

Subfamily MYRMICINAE

This subfamily, while not as primitive as the *Ponerinae*, is also of the more primitive type.

Representatives of the various genera are found in a variety of habitats and in many sections of the country. The species vary greatly in size, color, and size of colony. Some, because of their numbers and place of abode, get to be pests, as in the case of *Monomorium pharanois* (Linnaeus).

Most members of this subfamily also have large, well developed stings as were present in the *Ponerinae*. Instead of having a well developed constriction beyond the first segment of the gaster, as in the Ponerines, this segment is clearly separated off, so that the pedicel consists of two highly specialized segments, which is the outstanding mode of identification of all *Myrmicinae*.

Genus **Crematogaster** Lund

Crematogaster lineolata (Say)

Myrmica lineolata Say. 1836. Descriptions of new species of North American Hymenoptera and observations on some already described. Bost. Jour. Nat. Hist. I: 290. (Worker, female, male.)

This rather common species is found to nest in many situations. It was found in woods, in open fields nesting in hard, dry clay and in moist soil. Winged males and females were taken in July.

The nesting sites of this ant, as found here in the prairie, provide an illustration of insect adaptation to an environment. Here in the prairie where there is not an abundance of dead wood, it must by necessity find other nesting sites, if it is to survive.

Crematogaster lineolata var. **cerasi** (Fitch).

Myrmica cerasi Fitch. 1854. Trans. New York State Agric. Soc. XIV. p. 835. (Worker.)

This variety is slightly lighter in color than the previous one, otherwise is similar. It was taken from dead elm and oak trees. A very large colony, including workers, winged males and females, was taken in August, also from a dead elm.

Genus **Solenopsis** Westwood

Solenopsis molesta (Say).

Myrmica molesta Say. 1836. Descriptions of new species of North American Hymenoptera and observations on some already described. Bost. Jour. Nat. Hist. 1: 295. (Worker.)

The thief ant, by which name this minute species is sometimes known, is found in almost any type of surroundings. It lives independently or as a thief in other formicaries. It has been found in grass, in mounds, under stones all of which may be in moist or in dry places. It has been taken in this area in association with Myrmica and Formica, particularly on the tops and sides of the mounds they build. The colonies frequently become quite large. Winged males and females were taken during July and August.

Genus **Myrmecina** Fabr.

Myrmecina graminicola subsp. **americana** var. **brevispinosis** Emery.

Myrmecina latreillei subsp. *americana* var. *brevispinosa* Emery. 1894. Zool. Jahrb., Abth. of Syst., 8: 271. (Workers, females, males.)

The one small colony which was taken was found nesting in a crevice under the bark of elm in a damp, shady woods. It prefers shady, rather moist habitats.

Genus **Leptothorax** Mayr

Leptothorax longispinosus Roger.

Leptothorax longispinosus Roger. 1863. Die neue aüfgefuhrten Gattungen und Arten meines Formiciden Verzeichnesses. Berl. Ent. Zeitschr., VII, p. 180, No. 69. (Worker.)

A small, black species which is usually found nesting in tight places. Small colonies were taken from this area in the crevices of bark on living oak in the woods. Winged females were found in August in the scaly bark of elm.

Leptothorax fortinodis Mayr.

Leptothorax fortinodis Mayr. 1886. Die Formiciden der Vereinigten Staaten von Nordamerika. Verh. Zool.-bot. Ges. Wien. XXXVI, pp. 451, 452. (Worker, female.)

At no time was an entire colony of this species taken. A few stray individuals were found on the bark of oaks at various times, and twice they were found as strays in the open field.

Leptothorax curvispinosus Mayr.

Leptothorax curvispinosus Mayr. 1866. Sitz. B.k. Akad. Wiss. Wien, 53: 508. (Worker.)

The few stray ants of this species, which were observed, were wandering on vegetation at the edge of the woods.

Leptothorax curvispinosus subsp. **ambiguus** Emery.

leptothorax curvispinosus subsp. *ambiguus* Emery. 1895. Beiträge zur Kenntniss der Nordamerikanischen Amneisenfauna. Zool. Jahrb. Abth. f. Syst., VIII, pp. 317, 320. (Worker.)

Most of these small yellow ants were found as strays in the woods and in the open field. A few were found in the mounds of *F. neocinerea*. One nest with forty-four workers and a deälate queen was taken from a hummock in a field, during August. The firm, clay hummock was completely covered over with clover.

Genus **Myrmica** Latreille

Myrmica scabrinodis lobicornis var. **fracticornis** Emery.

Myrmica scabrinodis lobicornis var. *fracticornis* Emery. 1895. Zool. Jahrb. Syst. Vol. 8, p. 313. (Worker.)

This small, dark colored ant was taken abundantly in shallow, grass covered mounds of the prairie. It was found independently in mounds and was collected several times at the base of *F. neocinerea* mounds. With but one exception, it was always found where there was moisture, and was occasionally found in very wet clay. Winged males and females appear during August and were taken abundantly. This was one variety that was found in the moist furrows of newly plowed fields. Since the varieties of *M. scabrinodis* are so similar, there is some doubt as to the identification.

Myrmica scabrinodis sabuleti var.?

(This form is recognized by Dr. Neal A. Weber in an unpublished monograph of the genus Myrmica.)

This ant is quite similar to *M. fracticornis* Emery, except for a slight variation in the frontal carina. This variation is so slight that it offers difficulties, consequently identification of this species is also uncertain. This variety, not as common as *M. fracticornis*, was collected only once. The nest, which contained winged queens, was located in a small grass-covered mound, in a field.

Genus **Aphaenogaster** Mayr

Aphaenogaster fulva subsp. **aquia** (Buckley).

Myrmica (*Monomerium*) *aquia* Buckley, S. B. 1867. Descriptions of new species of North American Formicidae. Proc. Ent. Soc. Philad. 6: 341. (Worker, female.)

A moist blue grass-clover situation provided the habitat for the few times this subspecies was found in the open field. At no time was a nest observed in the area, the few specimens having been taken as strays.

Subfamily DOLICHODERINAE

There are comparatively few species in this subfamily, but they have a wide range of habitat.

In this subfamily the pedicel consists of but a single segment which is not vertically protuberant, and there is no constriction between segments in the gaster. The sting is vestigial or absent.

Genus **Dolichodorus** Lund

Dolichoderus plagiatus (Mayr).

Hypoclinea plagiata Mayr. 1870. Neue Formiciden Verh. Zool.-bot. Ges. Wien. 20: 957–960. (Worker.)

This ant was taken only once, and then just a few workers were found on a smilax vine which was growing on an elm tree at the edge of the woods. It is easily distinguished by the epinotal shelf or hood and by the presence of a coarsely puntcate head and thorax and lighter spots on the abdomen.

Genus **Tapinoma** Forster

Tapinoma sessile (Say).

Formica sessilis Say. 1836. Descriptions of new species of North America Hymenoptera and observations on some already described. Bost. Jour. Nat. Hist. 1: 287–288. (Worker, female.)

A wide-spread species, it is found to nest in varied circumstances. It was taken in the open field, in woods, under stones, on the bark of trees, in sunshine and in shade. The larvae and pupae of this ant are dull orange in color, and when an entire nest is uncovered it frequently emits a peculiar odor which has often been called a "rancid butter odor."

Subfamily COMPONOTINAE

The species represented in this subfamily are more highly developed in habits than some previously mentioned. The number of species is large and each genus is highly subdivided. In this subfamily we have represented some of the largest known ants as well as one of the smallest.

The pedicel in this group consists of only one segment and the sting is either vestigial or absent.

Genus **Brachymyrmex** Mayr

Brachymyrmex heeri subsp. **depilis** Emery.

Brachymyrmex heeri Forel subsp. *depilis* Emery. 1893. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna. Zool. Jahrb. Syst. 7: 635. (Worker, female, male.)

One of the smallest ants, it is known to nest in shady places, under stones, in cool, moist sites. Each time it was found on the prairie it was located in plowed furrows of cool, moist earth, which were at least eight inches deep. Its distribution is probably widespread here, but due to its nesting habits, it was not found frequently.

Genus **Camponotus** Mayr

Camponotus hecurleanus subsp. **pennsylvanicus** (DeGeer).

Formica pennsylvanica DeGeer. 1773. Mem. Serv. Hist. Insect., 3: 603, Pl. 31. Figs. 9–10. (Workers, females, males.)

This ant shows a wide range of adaptability to temperature and moisture. It is by far the most abundant *Camponotus* in the Middle West. Each time this species was taken in the oak-

hickory woods at the edge of the prairie, it was found in partially decayed logs and stumps. Once it was found as a stray in the open field about twenty-five feet from a poplar tree, wandering about in the grass.

Camponotus caryae (Fitch).

Formica caryae Fitch. 1855. Trans. N. York State Agri. Soc. 14: 855–859. (Worker, female, male.)

Loose bark of trees and hollow twigs formed the nests for this species. At no time were large numbers taken, because the individuals of a colony on being disturbed scatter quickly. Winged females were found in August.

Genus **Lasius** Fabricius

Lasius niger subsp. **alienus** var. **americanus** Emery.

Lasius niger (L.) subsp. *alienus* Forster var. *americana* Emery. 1893. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna, Zool. Jahb. Abth. Syst. Vol. 7, p. 639, pl. 22. (Worker, female, male.)

This ant is the most common and most abundant of all ants and is found in nearly all parts of North America. It displays evidence of indifference in the location of its nesting sites, for it has been found in this prairie region each time collecting was done and in all types of habitat. In the woods it prefers damp logs for its nesting sites, while in the prairie proper, it nests in the soil. Winged males and females were found abundantly in August.

Lasius umbratus subsp. **mixtus** var. **aphidicola** (Walsh).

Formica aphidicola Walsh, B. D. 1862. On the genera of aphidae found in the United States. Proc. Ent. Soc. Philad. 1: 310. (Worker, male.)

The colonies of this variety cultivate root aphids and coccids. It is undoubtedly because of this characteristic that these ants were found in the moist roots of grass which was growing at the base of trees in the woods. Collections were also made from logs in the woods and from mounds located near a ditch at the edge of the woods.

Genus **Formica** Latreille

Formica fusca var. **subsericea** Say.

Formica subsericea Say, T. 1836. Bost. Jour. Nat. Hist., 1: 289. (Worker, female.)

Workers of this species were taken all through the woods in partially decayed logs, in mounds at the edge of the woods and along roadside ditches. They were encountered quite frequently, for the ant is common in the region.

Formica pallidefulva subsp. **nitidiventris** Emery.

Formica pallidefulva Latreille var. *nitidiventris* Emery. 1893. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna. Zool. Jahrb. Abth. Syst. Vol. 7, p. 672, pl. 22. (Worker.)

Most of these ants were found in the open field, but always in places protected by stones and hummocks. They were also found on the slope of Tymochtee Creek under stones which were shaded by trees. Winged queens were taken in July.

Formica pallidefulva subsp. **nitidiventris** var. **fuscata** Emery.

Formica pallidefulva subsp. *fuscata* Emery. 1893. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna. Zool. Jahrb. Syst. 7: 656. (Worker, female.)

Only a few workers of this variety were found in the region, and these on the bark of an oak in the dense forest. This species resembles very closely *F. nitidiventris*, except that it is slightly darker.

Formica pallidefulva Latreille subsp. **schaufussi** Mayr, var. **incerta** Emery.

Formica pallidefulva schaufussi var. *incerta* Emery. 1893. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna. Zool. Jahrb. Syst. 7: 655–656. (Worker, female, male.)

These were found as strays in the open field and also at the edge of the woods

Formica cinerea var. **neocinerea** Wheeler.

Formica cinerea cinerea, var. *neocinerea* Wheeler. 1913. A Revision of the Ants of the Genus Formica (Linne) Mayr. Bull. Mus. Comp. Zool. Harvard, Vol. 53, p. 399, 524. (Worker, female, male.)

This variety so closely resembles *F. rutilans* and *F. montana*, that it is quite difficult to make a distinction except for slight color variations. It is often called a prairie ant, for in the natural hummocks it finds a perfect nesting place. This is the ant which is found most conspicuously in the Kildeer Plain area, and in some fields is found in almost a pure *F. cinerea neocinerea* community.

The mounds are numerous and are quite close together. They vary in size, but generally are about six or eight inches high and about twenty inches broad. The largest mound noted was at least ten inches in height and thirty-six inches in length.

The bases and sides of the mounds usually are grass-covered and the tops are nearly always barren. Some have been found where the tops of the mounds also were grass-covered. The mounds which are free of grass on top, generally have a thin layer of debris there. This debris is composed of dry twigs, fragments of grass and possibly materials brought up from the mound.

Sixty-five such mounds were opened and all but four were found in the prairie in typical *neocinerea* communities. The remaining four were found at the edge of the forest.

One very interesting thing was noted in the fact that twenty of these mounds were built at the base of thistle. The live thistle either protruded from the mound or was found at the side. That the presence of these live thistle plants is of any consequence is uncertain, but it appears far from being coincidental, since almost a third of the mounds presented this feature.

There is a possibility that the honey-dew secreted by the aphids which dwell upon this thistle (*Circium lanceolatum* L.) furnishes the motive in this association, for frequently *F. cinerea neocinerea* has been observed on the plants, which harbored aphids, in great numbers.

The necessity of mounds for this variety of ant is not positive but it seems likely that they are a refuge and protection in periods of excess moisture, since drainage is poor. The nests themselves extend into the soil to the water table, a depth of several feet. They may dwell either below the surface level or above in the mound, as necessity demands.

A greater choice of temperatures for brood rearing occurs in a mound superimposed on underground galleries. The temperature at various places within a mound is unequal, thus making it possible for the brood to be moved to warmer and cooler areas, as may be necessary.

Formica cinerea var. **rutilans** Wheeler.

Formica cinerea var. *rutilans* Wheeler. 1913. A revision of the ants of the Genus Formica (Linne) Mayr. Bull. Mus. Comp. Zool. Harvard 53: 399, 525–526. (Worker.)

This variety was located in three nesting sites: in a newly plowed field, a mound in the prairie resembling that of *F. neocinerea* and in a small mound at the edge of the woods. Due to the similarity of this ant to *F. neocinerea* in both appearance and habits, it is difficult to identify, consequently, this identification is uncertain. It was not observed abundantly in the region.

Formica montana Emery.

Formica subpolita var.? *montana* Emery. 1893. Zool. Jahrb. Syst., Vol. 7, p. 663.

This ant is extremely difficult to distinguish from *F. neocinerea* and *F. rutilans*, for both the ant and the mound resemble these two species.

The mounds which were opened were found in the same field scattered among the *F. neocinerea* mounds. These mounds were present also at the base of thistle. The habitats of these ants seem to be identical.

Formica ulkei Emery.

Formica ulkei Emery. 1895. Beiträge zur Kenntniss der Nordamerikanischen Ameisenfauna. Zool. Jahrb. Syst. 7: 663, pl. 22, fig. 7. (Worker.)

This ant belongs to the *exsectoides* group which is distinguished by having the head of the worker and the female deeply excised behind.

The mounds which this ant builds resemble greatly the mounds built by *F. neocinerea*, but they are distinguished by their general shape. The *F. ulkei* mounds are much rounded on top and as they continue to grow, they are built in height as well as in width. The *neocinerea* mounds, in contrast, have the tops flattened and grow chiefly in width.

The location of the *ulkei* mounds shows a marked difference, for this species prefers to nest at the edge of the woods or along roadsides and ditches where there is a constant supply of moisture.

DISCUSSION

1. *Formica cinerea neccinerea* is by far the outstanding ant in this Kildeer Plain area, both with reference to the size of the colonies and its widespread distribution in the region.

2. The species of ants in the area are determined in part by the topography of the region, the amount of moisture, and the materials which can be used for nesting places.

3. On the edge of the plain where slopes and wooded areas are included, the number of species increases in proportion to the materials which can be used for the nests of colonies.

4. Many of the ants commonly found in other parts of the state are not found here, or are rarely found, due to restrictions in the environment.

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