

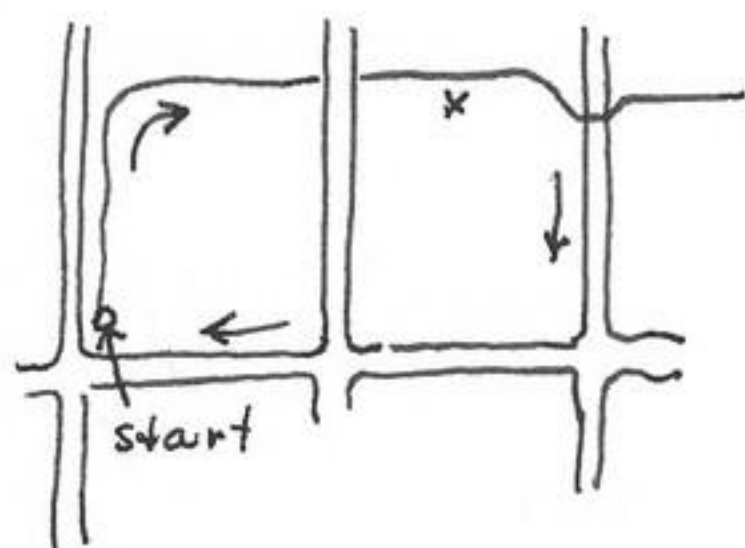
JOURNAL 1959

JAMES W. BEE

Naskell Bottoms, S of Lawrence, Kansas

February 1, 1959

Annett C., Mary P and I made circuit of dikes from SW corner. Snow covered ground and all runways of Sigmodon were covered except where the animal had surfaced or where a small section of the runway was exposed on the south and west facing slopes. The animals ran from the lowlands to the nest holes on the upper slope of the dike. Some were scurrying on surface of snow but generally in same direction as trails under the snow. From area marked X (see notes of Dec 25, 1958)



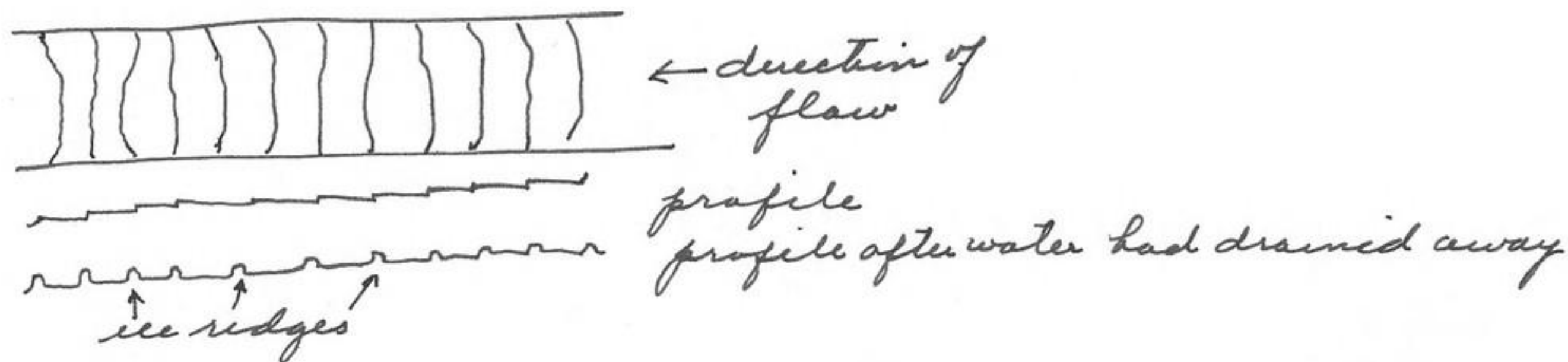
we saw 7 Sigmodon from under door and 3 in general area of the 42 x 15 feet of previous census (Dec. 25, 1958). Since Dec 25, 1958 the population had decreased from 40 to 10 Sigmodon. The intake and disgorged body of two Sigmodon were within the above

area. It is evident that the dike are places of refuge in periods of excessive water and cold winters.

Univ. Kansas, Lawrence, Kansas

February 3, 1959

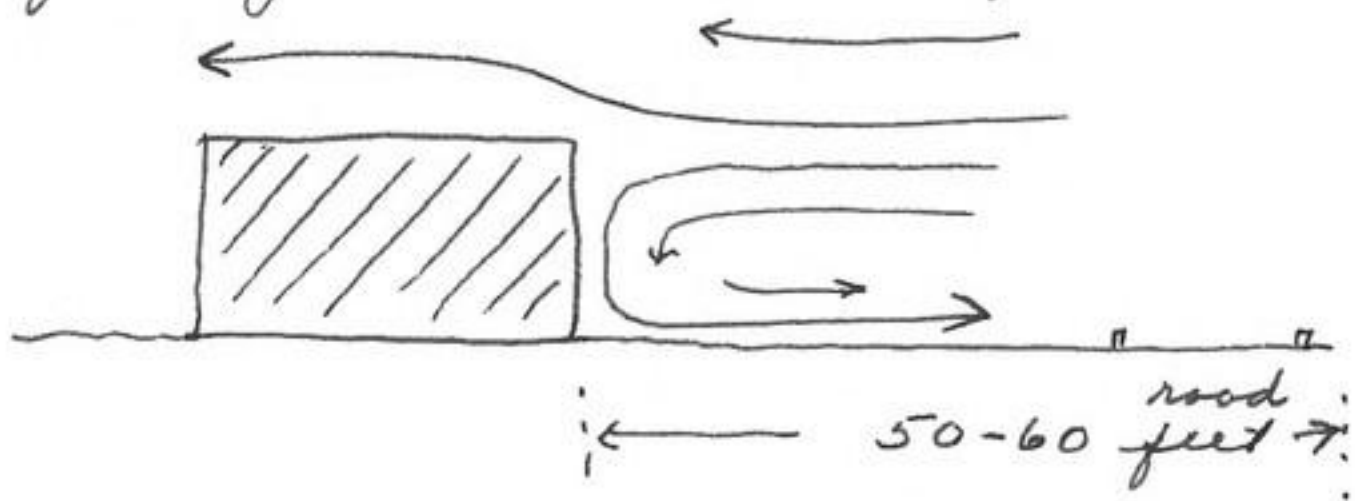
On this date noted the following conditions of ice debris on sidewalks and roads.



The above condition after rain and freeze when ice particles formed on water and with downslope movement (gentle to abrupt) formed ice ridges like those in northern Alaska. Other formations were:

The snow ripples formed in opposite way to water produced sand ripples. Snow wet. ← direction of wind.

The wind from N and as it hit the front of Hack auditorium on the campus was deflected downward and cleared snow from ground to N as far as the middle of the road. The sails in flower garden in front of Hack (30 feet beyond) eroded $\frac{3}{4}$ of an inch from this deflected wind.



Haskell Bottoms, S of Lawrence, Kansas
February 14, 1959

James Robert collected 10 *Sigmodon* from ditches in the Haskell Bottoms. He noted 5 *Sigmodon* from area mentioned (Dec 25 & Feb 1). Son



James also collected two *Pseudacris* 590214-13 from under a log - a third one was also present. These frogs were inactive and did not move and were probably hibernat-

ing. Two were placed in aquariums and one called at about 3:00 AM that night (morning of next day). The *Sigmodon* 590214-1 to 590214-12 were placed in a cage at the Unw. for dissection.

Unw. Kansas, Lawrence, Kansas
February 17, 1959

Killed *Sigmodon* 590214-1 ♂ and preserved in Bouvier's. These will be used to report on the general histology of the Cotton-rat. Length 284, hind foot 33, weight 115 gms. The Cardinals (one) was singing on the campus. It was the first time I had heard the cardinal sing this season.

Unw. Kansas, Lawrence, Kansas
February 19, 1959

Mr. J. T. Vance from Snake River valley south of Boise, Idaho and a graduate student at K.U. reports:

Jack rabbits, in river valley of the Snake, increase or decrease according to climatic conditions of the spring period. If the weather is dry in February and March, the first litter of rabbits (born 2nd or 3rd week in February) are reared to adults. If, however, and in the same period

the weather is wet and cold, the young mortality is high. The second litter, born in middle of June, normally survive. A dry spring and dry summer reduces available food and frequently causes winter kill. The cycle of increase of rabbit population is seven years. The climatic cycle is 13 years. Several years ago the native jackrabbit population was artificially subjected to tularemia with the result that great numbers of rabbits were destroyed. The disease was not contagious to either man or other native mammals; even the cottontail did not get the disease.

Univ. Kansas, Lawrence, Kansas

February 19, 1959

Dissected a *Scymnodon*, 590214-2 ♂ this date and placed tissue in Bouin's and formalin. It measured: length 262; foot 30; weight 67 gms.

February 20, 1959

Dissected a *Scymnodon*, 590214-3, ♀ this date and placed in Bouin's. It measured, length 269, hindfoot 31; weight 169 gms. Dissected a second *Scymnodon*, 590214-4, ♀. It measured, length 276, hindfoot 32, weight 96 gms.

Lawrence, Douglas Co., Kansas

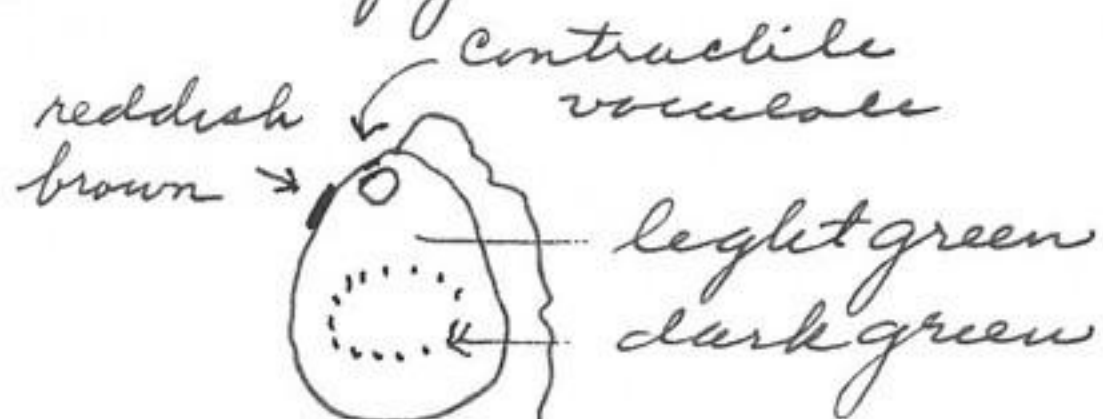
March 8, 1959

Geese (snows) flew N about 4:30 A.M.

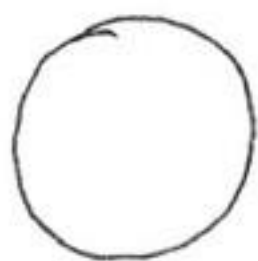
Univ. Kansas, Lawrence, Kansas

March 8, 1959

Collected water sample from Potters Lake. There was a bloom of green colored organisms:



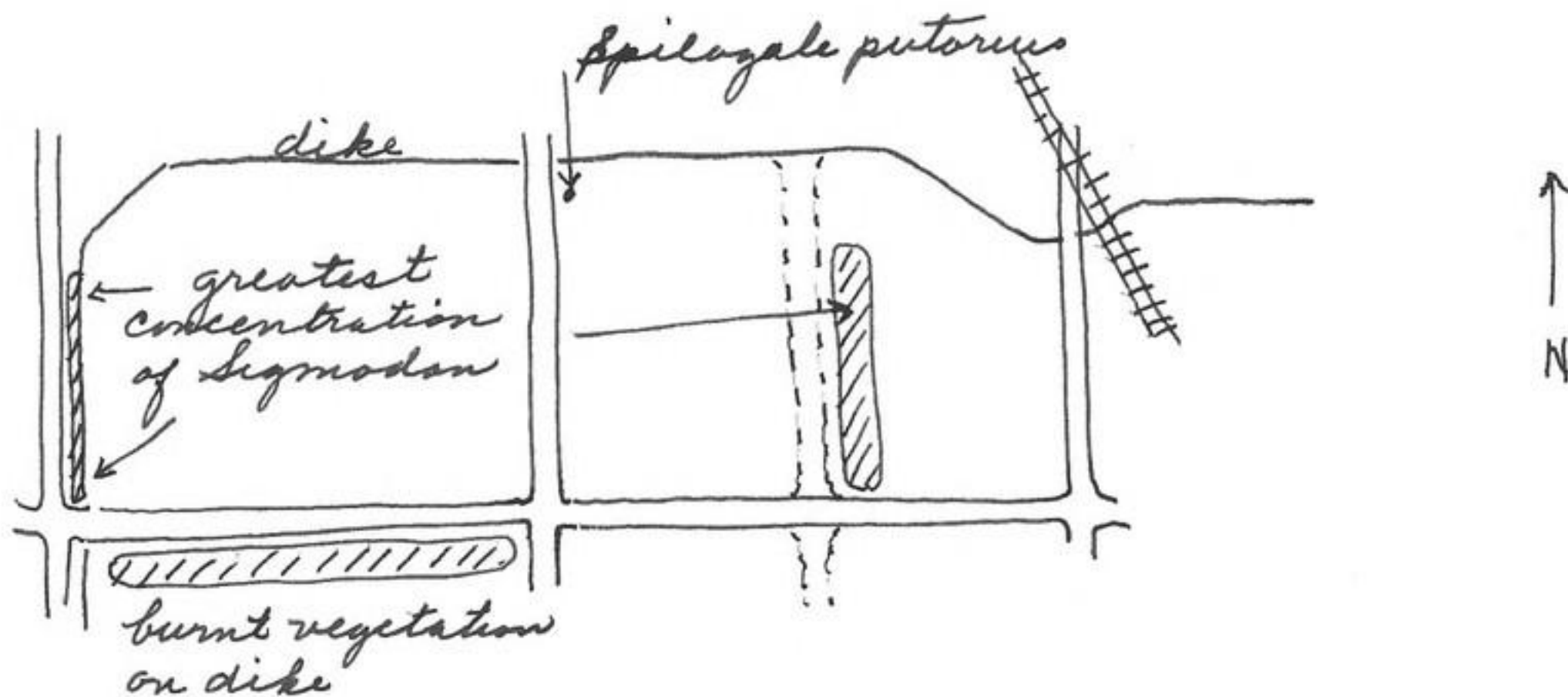
dominant form and could be supplied with 1 to 3 flagella.



like above but round and no flagellum.

Haskell Bottoms, Lawrence, Kansas

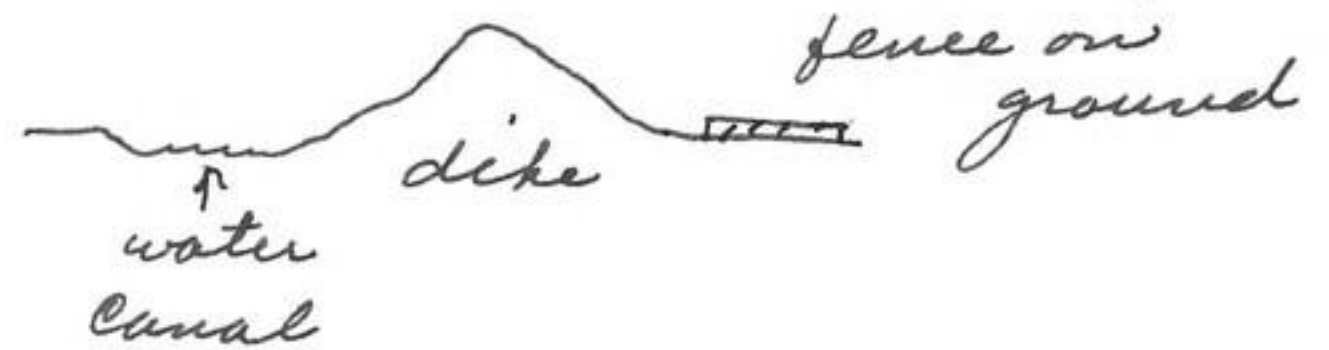
March 8, 1959

Annette and I checked *Sigmodon* population.

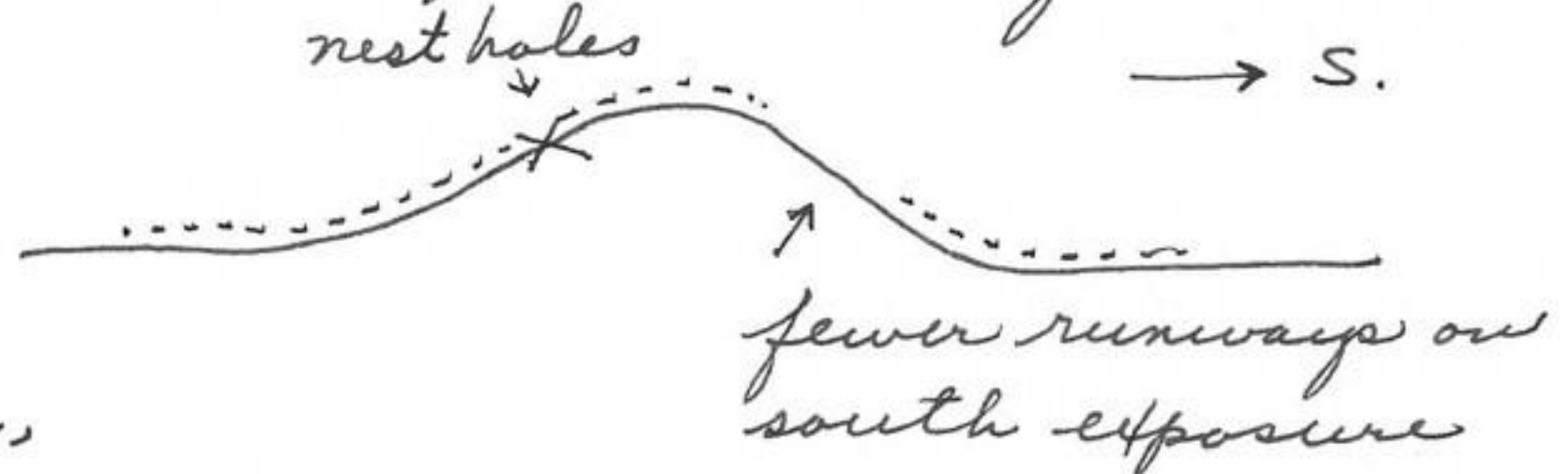
There were no *Sigmodon* in area checked Dec. 25, 1959. Thirteen *Peromyscus maniculatus* in one nest of plant fibers under a door (SE of east shed) on ground. *Peromyscus* were never noted in this area in the period of high concentration of *Sigmodon* and it is assumed that they entered after the departure of the *Sigmodon*. The area (referring to the area of 42×15 of Dec. 25, 1958) had changed considerably since we visited it February 14. The grasses and weeds had been blown over and compressed as a result of winds and snow and the plant fibers were softened by the rains. Soils were damp and the nearly standing water was considerably higher. Both here and on the entire length of the dike around Haskell Bottoms, the overhead protection of winter stand of vegetation was 80% or more reduced from the early winter condition. The optimum areas were on the west exposure of the west dike where drifted debris from the last flood of last year had deposited a $1\frac{1}{2}$ foot mat of dried stems of plants. The *Sigmodon* were in the matted natural aquatic grasses at base of dike and would retreat up to holes under matted grasses and debris on dike. In other areas of the dike where we found *Sigmodon* earlier under winter conditions of high grass protection, we did not find them there today, indicating that they remained only in those areas affording dry nesting areas and adequate overhead protection. The main fields of the 'bottoms' were inundated or supersaturated and did not, except for a

instances support mammals. It is believed that the *Sigmodon* area of feed along utility line (census area) were driven to the higher dikes and that in the winter months the decrease in numbers was a result of natural predation and that the final depopulation of the area was a result of decrease of overhead protection and wet habitat and increase predation. There was considerably more digging activity by skunks, coyotes and other soil disturbances. One *Spilogale* was under an old fence gate, ^(on lowland adjacent dike) in pursuit of a *Peromyscus maniculatus*. The skunk gained top of dike and continued west along the crest of the dike.

There were more rabbits (cottontails) on dike today as a result of being driven



by rising water in fields of 'bottoms' now becoming nearly all supersaturated or covered with water. No tree sparrows which formerly were most conspicuous bird along the dike in winter months. Winter hawks not in area today. 2 marsh hawks in field. Numerous meadowlarks singing in SW section of area examined. On a dike that had been burned of its grasses (high) the *Microtus ochrogaster* runways and nesting holes were plainly visible. nest holes more commonly seen on N exposure near top of dike.



Collected one *Sigmodon*.

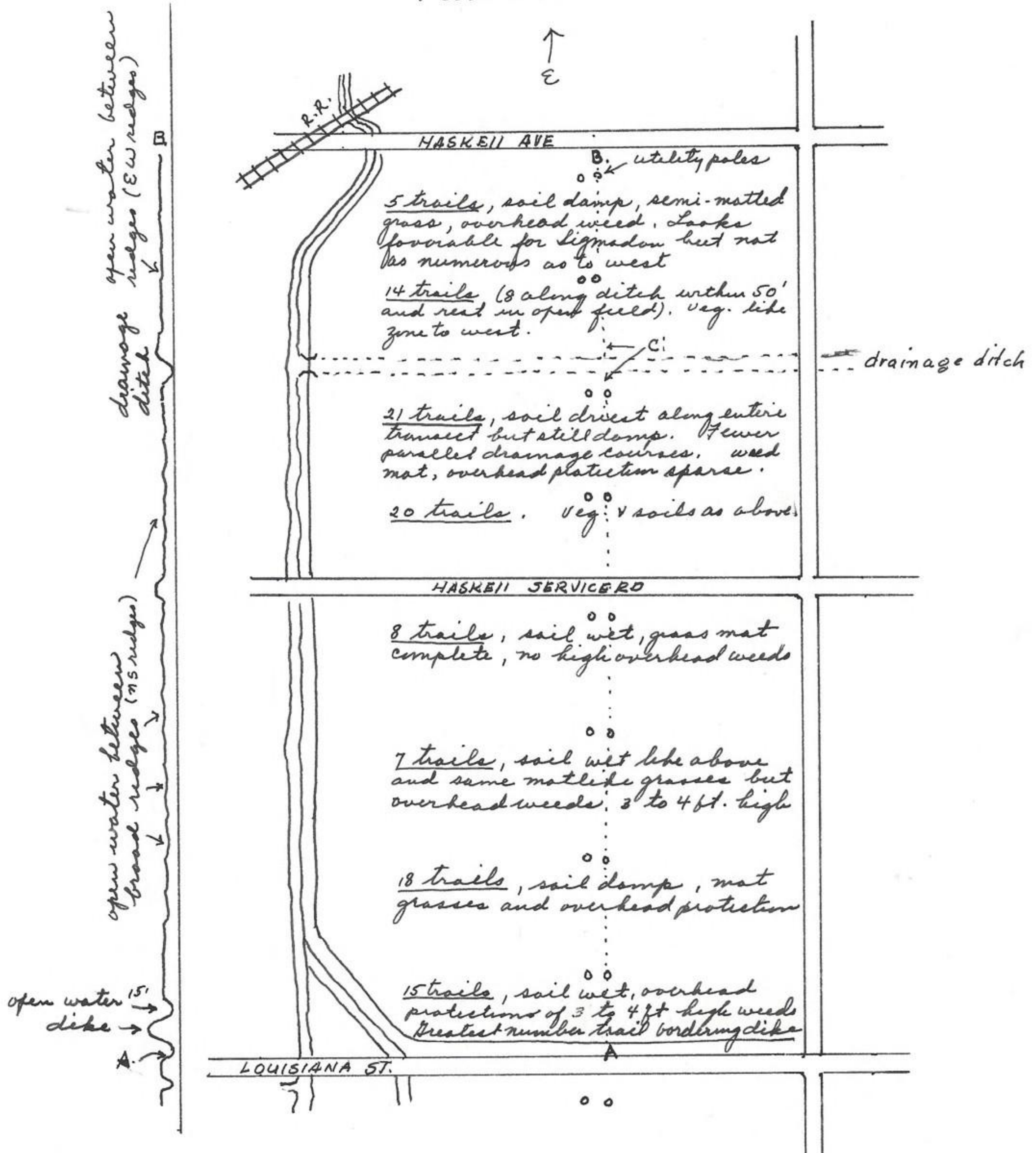
590308-1. Flock of approx.

3,000 red-winged blackbirds in area, particularly in SW corner of area of bottoms examined today.

Haskell Bottoms, Lawrence, Douglas Co., Kansas
March 9, 1959

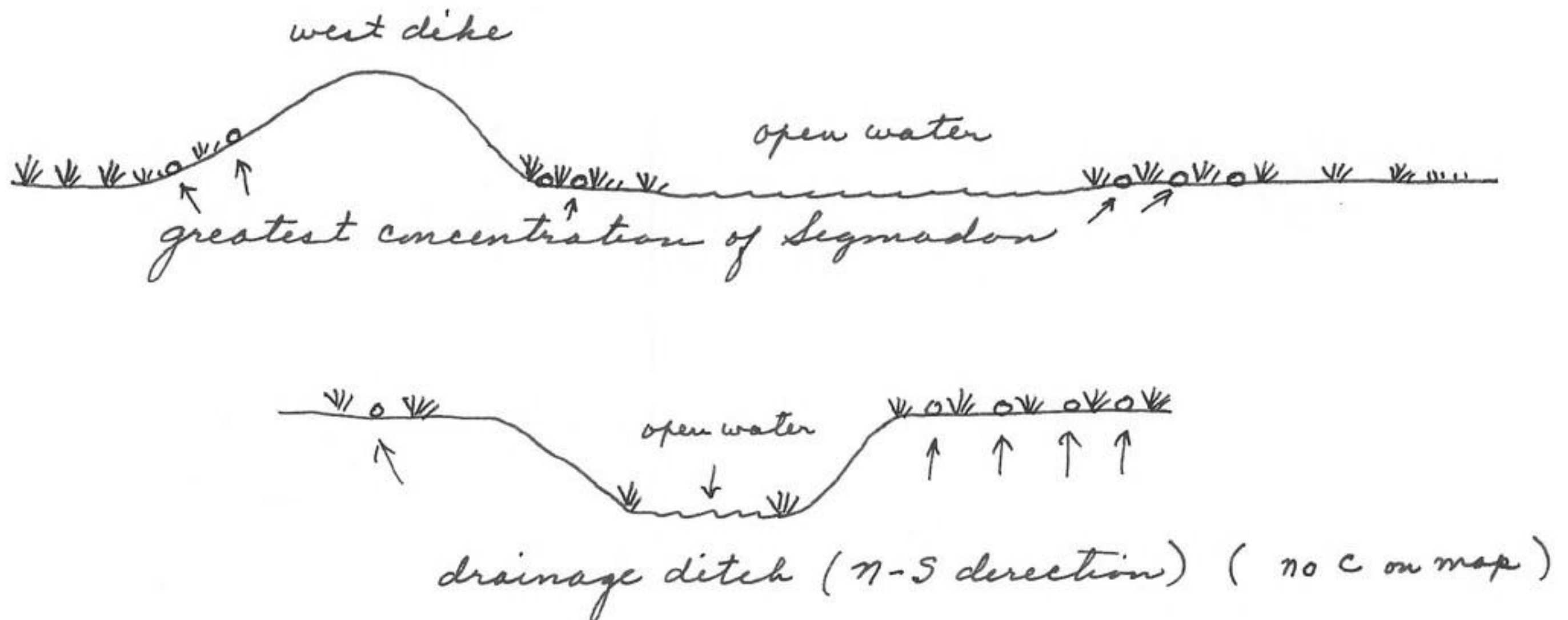
Made linear transect census of runways across Haskell Bottoms from west to east (Louisiana St to Haskell St). following precisely the alignment of the south poles of the powerline. Counted all trails of *Sigmodon* or *Microtus ochrogaster* which were being used. Old trails, foraging trails or only slightly used trails were ^{not} counted.

Transect for small mammal Census



The transect was from road at A. to B (1 mile away) at east end of field and bordering the road. The transect was along the south alignment of the 2 poles. On the basis of a transect 1 mile long and 3 feet wide (108 trail systems) would calculate that in a one-half square mile of Haskell Bottoms there are approx 57,240 trail systems and if one allows 3 microtines per trail system there are 171,720 microtines.

in the $\frac{1}{2}$ sq mile. On the basis of trapping *Sigmodon* is .25 times as common as *Microtus ochrogaster* or 164,852 *Sigmodon* and 6868 *Microtus ochrogaster*. The new used trails could be identified by bare compact soils from constant use, sharp edges of the trail and general sign of freshness of trail and use. These trails, each of which probably constituted a family trail of 2 or more members, even as many as 5 or more individuals were in the area of wet to damp soils between the parallel drainage swales. The greatest concentration of trails bordered higher relief such as dikes, or well drained slopes of drainage ditches thus:



Earlier in the season the upper slope of the dike were used but now they (the *Sigmodon*) were on the lower slopes among the matted grasses. Surface nests of *Sigmodon*, some 3 gallons capacity were throughout the transect along base of dike indicating that the *Sigmodon* were generally distributed wherever the ground was not inundated with water. Water in lowlands and drainage swales not over 8 inches deep; most water only 3 or 4 inches deep. Wherever soil was borrowed for dike, area supported small shallow ponds, generally distributed adjacent dike. Muskrats occupying lakes; diggings extensively along edge of dike. One muskrat was in drainage ditch where utility lines cross ditch on east edge of Haskell Bottoms. Considerable digging by *Sigmodon* for roots throughout area. These roots will be eaten until new sprouts, grasses and other vegetation appears. The wet areas have more succulent grasses. Frogs singing in nearly all ponds but nothing compared to what they will do later in the season. There were no rabbits along transect. Seven *Sigmodons* noted running in trails

along transect. One marsh hawk in area. From west dike caught 20 Sigmodons 590309-1 to 590309-20.

Haskell Bottoms, Lawrence, Douglas Co., Kansas

March 10, 1959

Four male redwings blackbirds on territories. Yesterday there ~~was~~ ^{was} only one.

Haskell Bottoms, SW corner, S Lawrence, Douglas Co., Kansas

March 23, 1959

Trapped seven Sigmodons along dike:

590323-1♂	Sigmodon	245-99-33-76 gms, testes 18 mm
590323-2♂	"	266-116-35-142 gms, testes 19 mm
590323-3♀	"	240-104-31-65 gms, ut. slightly enlarged
590323-4♀	"	242-94-29-75 gms, ut. enlarged.

Univ. Kansas, Lawrence, Kansas

March 24, 1959

Watched a screech owl and a blue jay below Strong Hall this a.m. The owl was being harassed by the jay in a conifer tree (Austrian pine) at about 15' high and at the center of the tree. At no time did the jay utter a sound while it annoyed the owl by flying at the owl from distances of not more than 5 feet away. The owl uttered the noises. The owl flew into another pine 10 feet away and the activity continued until I approach to within 8 feet when the jay left and flew to another tree 50' away. The owl was more concerned of my presence than the jay was concern about me, but the jay was first to leave. During the fighting activity, the owl followed the jay by turning its head and sometimes its body. Occasionally the head of the owl seemed to rest on its back as it watched the jay overhead and to the rear of the owl. The most significant thing was the total lack of vocal response of the jay while annoying the owl.

Haskell Bottoms, SW corner, S Lawrence, Douglas Co., Kansas

April 27, 1959

Collected 15 Sigmodon hispidus and 2 microtus ochrogaster from the SW corner of Haskell Bottoms. The population of Sigmodons has, in the last 2 weeks, undergone about a 50% reduction since March 9 of this year. Some of the largest males

were collected along the fence row. many trails that were once used are now deserted. measurements of these animals are:

590427-1	♂	<i>Sigmodon hispidus</i>	263-101-35-95 gms, testis 20 mm
590427-2	♂	" "	276-104-32-132 " , " 20 mm
590527-3	♀	" "	260-96-31-106 gms, 4x1 emb 17 mm
590527-4	♀	" "	220-78-28-51 gms, ut. enlarged
590427-5	♀	" "	264-101-31-96 gms, 3x3 emb 14 mm
590427-6	♀	" "	248-91-31-85 gms, 5x1 emb 4 mm
590427-7	♀	" "	263-98-33-104 gms, 2x3 emb 18 mm
590427-8	♂	" "	260-98-31-80 gms, testis 20 mm
590427-9	♂	" "	238-90-30-77 gms, testis 19 mm
590427-10	♂♀	" "	242-90-30-84 gms, ut. enlarged, vasc.
590427-11	♀	" "	252-94-34-99 gms, 3x2 emb 15 mm
590427-12	♀	" "	252-92-31-97 gms, ut. enlarged
590427-13	♂	" "	243-96-31-90 gms, testis 19 mm

The females are more alert and will not allow handling like males. The females are smaller in appearance because of the smoothness of fur which may be a new molt in contrast to the old fur of males, or the males, because of fighting might have a more ragged appearance. The females also fight the chloroform of the killing jar in the laboratory more than the males. A king rail was feeding along the side of a small sedge lined pool. It flew approx. 100 feet and after alighting ran in the short sedges for at least 30 feet. I could not flush this bird from an area I knew it must be in. The lesser yellowlegs and bluewing teal were still in area. Son James Robert and daughter Annette C. caught a 1 2/3 lb bass, 1 lb. bullhead and small perch in the small pond in the SW corner of the Bottoms. Muskrats must have a den near this pond as they are seen on every occasion we have visited the area. A Wilson snipe and a Virginia rail were flushed along the sides of this pond. The bullfrog is the most conspicuous frog around the edge of the lake.

Haskell Bottoms, W side, Lawrence, Douglas Co., Kansas

May 8, 1959

Last night set 12 live traps on dike and along edge of pond and caught 8 *Sigmodon hispidus* and 2 *Microtus ochrogaster*. Their measurements are as follows:

590508-1 ♂ *Microtus ochrogaster* 146-36-21-12-46 gms, testis 14 mm

590508-2 ♂ *Microtus ochrogaster* 144-35-19-12-36 gms, testis 13 mm
 590508-3 ♀ *Sigmodon hispidus* 261-89-31-19-102 gms, 1x4 plac. scars
 Seven other *Sigmodon* were caught but not measured.

May 15, 1959

Trapped 5 *Sigmodon hispidus* in same area as above.
 Also one *Microtus ochrogaster*. Measurements are as follows:

590515-1 ♀ <i>Sigmodon hispidus</i>	255 length, 3x2 emb 48 mm
590515-2 ♂ " "	279-94-34-17-145 gms, testis 20 mm
590515-3 ♀ " "	265-90-31-17-98 gms, 7x1 emb 5 mm
590515-4 ♂ " "	259-96-33-19-102 gms, testis 19 mm
590515-5 ♂ " "	255-94-33-18-100 gms, testis 18 mm
590515-6 ♀ <i>Microtus ochrogaster</i>	137-21-20-11-35 gms, testis 11 mm
590515-7 ♀ <i>Sigmodon hispidus</i>	240-90-31-129 gms, 3x2 emb 38 mm

Lawrence, Douglas Co., Kansas

June 6, 1959

Left Lawrence at 3:15 P.M. for Wabaunsee Lake. Daughters Mary and Annette in party. Mileage at Lawrence 77240.
 Temp 93°F. Arrived Wabaunsee Lake 6:00 P.M. 73 miles from Lawrence. Camped SE side of lake at bridge where drainage enters lake from long canyon to south.

Wabaunsee Lake, Wabaunsee Co., Kansas

June 7, 1959

make trip to headwaters of drainage south of lake, thence east to top of ridge, thence north to camp. From creek approx 1/5 mi S of lake collected the following:

590607-1 *Thamnophis*. From edge of flowing creek. It was on bare gravels and searching individual depressions made by cattle. Creek contained numerous minnows of several species and crayfish. When captured the snake held its mouth open as a defensive gesture. When placed in a thin plastic bag the snake got the plastic in its mouth from inspiration movements and almost died from lack of oxygen. This was the only snake noted in 5 hours in the field.

590607-2 Spadefoot toad

all spadefoots were from ^{near} water. Conspicuous and common.

590607-3 Spadefoot toad, same as above

590607-4 " " " " "

nearly

590607-5 *Rana pipiens*. From edge of creek. These frogs were along edge of creek within one jump from water. Others in dense grasses if removed from immediate vicinity of water. Sunken pools of water invariably had 2 or 3 frogs at edge within one jump away.  Common and generally distributed.

590607-6 *Rana pipiens*. Ibid.

590607-7 " " discarded

590607-8 Frog. Small and adjacent to water or within two or three hops from water. They would dive into water and then swim immediately back to shore. Generally distributed.

590607-9 Frog. Ibid

590607-10 " "

590607-11 " "

590607-12 " " (discarded)

590607-13 *Rana catesbiana*. Common around shores of lake and in creeks some 1/2 miles from the lake. Beyond about 1/2 mile on creek, only young frogs of this species. noted several breeding.

590607-14 Small *Rana catesbiana*

590607-15 Tadpoles of *Rana catesbiana* without legs

590607-16 Tadpoles with legs - *Rana catesbiana*.

590607-17 Frog.

The upland plover numerous (18 counted in upper drainage of canyon south of lake. Seven yellow-bellied cuckoos noted. They were in isolated trees along creek and were loathe to leave these trees; probably searching for young or eggs of other birds. Did not see horned toads or lizards except one Bailey colored lizard in rocks near camp at lake.

Lawrence, Douglas Co., Kansas

June 8, 1959

P. Ogilvie presented me the following specimens taken at Miami County State Park in Miami County, Kansas and collected June 18.

590608-1 *Ancistron mokeson* from under a log in deciduous forest.

590608-2 *Bufo terrestris charlesmelhi* from forest community.

Tonganoxie Lake, Kansas

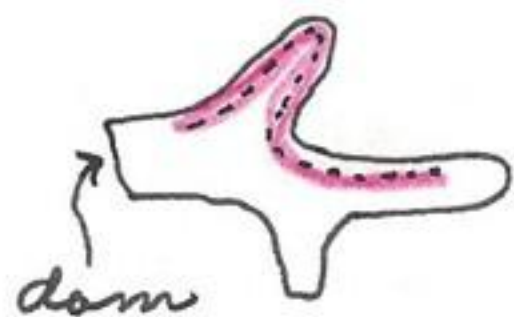
June 13, 1959

James, Mary & Annette camped overnight at Tonganoxie Lake. Collected

the following frogs in pond below the dam.

<u>590613-1</u>	<i>Rana crepitans blanchardi</i>			
<u>590613-2</u>	"	"	"	(Corrosion prepared specimen).
<u>590613-3</u>	"	"	"	
<u>590613-4</u>	"	"	"	
<u>590613-5</u>	"	"	"	
<u>590613-6</u>	"	"	"	
<u>590613-7</u>	"	"	"	
<u>590613-8</u>	"	"	"	
<u>590613-9</u>	"	"	"	
<u>590613-10</u>	"	"	"	
<u>590613-11</u>	"	"	"	

Photographs 590613-12 to 590613-16 of family in boat. Noted a crow pick up a dead fish from the surface of the water without alighting. 5 large *Natrix* swimming (singles) in lake, some along edge of shore others 80 feet or so from shore. Others on rocks at edge of lake and swam into water when approached.



Natrix more common as marked in red. These areas are adjacent rocky slopes which are covered with deciduous trees. There are good hibernating areas.

1 1/2 mi. W and 2 mi. S Lawrence, Douglas Co., Kansas
June 15, 1959

James, Mary and Annette and I collected the following material from fish ponds at the Fisheries Lab SW of K.V.

<u>590615-1</u>	<i>Acris crepitans blanchardi</i> .		
<u>590615-2</u>	"	"	"
<u>590615-3</u>	"	"	"
<u>590615-4</u>	"	"	"
<u>590615-5</u>	"	"	"
<u>590615-6</u>	<i>Rana pipiens</i>		
<u>590615-7</u>	<i>Terrapene ornata</i>		
<u>590615-8</u>	<i>Eumeces obsoletus</i>		
<u>590615-9</u>	<i>Thamnophis ordinatus parietalis</i>		
<u>590615-10</u>	<i>Acris crepitans blanchardi</i>		
<u>590615-11</u>	"	"	"

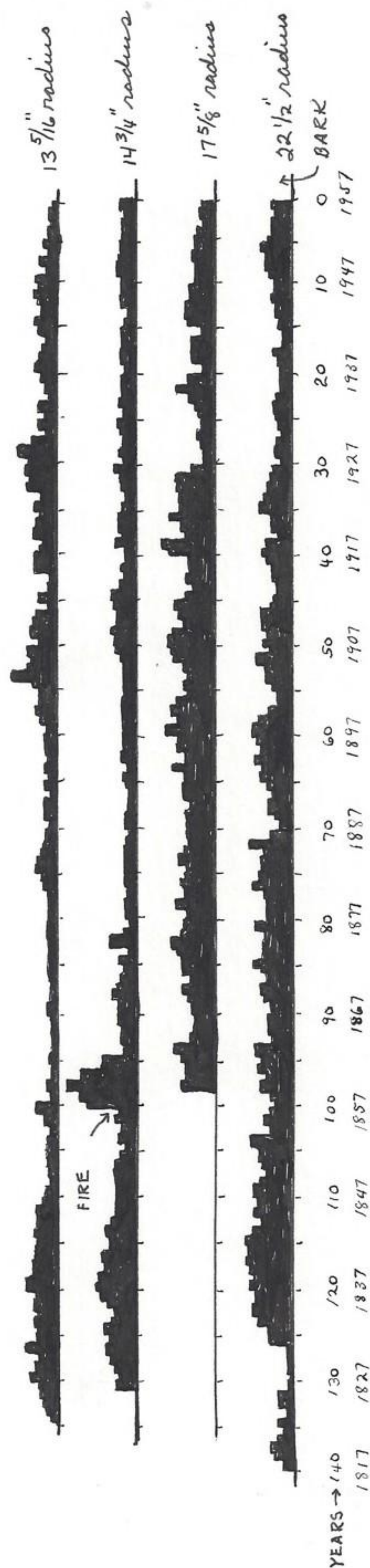
590615-12 to 590615-18 (exclusive no. 590615-14)

The *Eumeces* and *Terrapene* were under flat rocks which were associated with outcropping of rocks at brink of slope to north. Two *Terrapenes* together, one of them 1/2 size the other.

Baldwin Woods, N. Baldwin City, Kansas

June 15, 1959

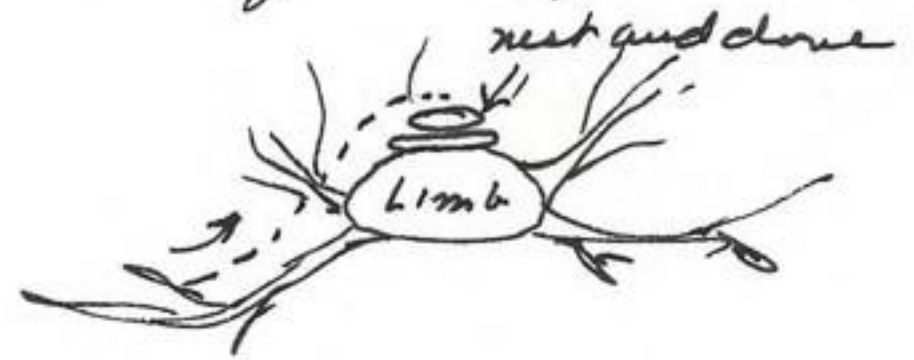
On a tract of land (lowest area of Baldwin Woods) measured four elm trees which had recently been cut. On the diagrams, each annual ring is represented by a solid black block, the width of the annual ring is proportional to the height of the block, that is, the height of the block is exactly the width of the annual ring. We are now in a low period of precipitation and a change to greater moisture is indicated. Recent increment of growth can probably be correlated with drainage from the soils of the valley and fire. Differences in amount of shade might also determine width of annulations. One major fire occurred about 1855 or about one hundred years ago. One elm tree, 2/10 mi up Canyon from Railroad Crossing measured 14.9 feet in diameter at chest height. It seems a shame that these old trees should be cut from this unusual forest. Better the area be made into a reservation or city park where these large trees could be perpetuated as an example of the original climax forest community of this area.



1620 Tennessee St., Lawrence, Douglas Co., Kansas

June 16, 1959

Watched a blue jay molest and finally steal one young mourning dove from its nest. The nest and young were located in a mulberry tree, approx. 30 feet from the ground. A blue jay approached nest and was repelled by the forceful flapping of the doves wings, each stroke was directed at the jay who, most of the time managed to keep just beyond the reach of the dove. The dove would, at the same time spread its tail and other wing to cover young. The jay continued the molestation for approx 4 minutes while the dove continually struck at the jay with its wing. Neither of the birds offered ^{vacill} sounds. The jay held its mouth open as if it was hot. During the 4 or 5 minutes of molestation the jay, on at least 10 times, tried to get the young by actual contact with the dove. Once it dropped on the back of the adult dove and pulled feathers. The jay continually worked around the dove from all angles. One of its approaches was from below as if a surprise attack.

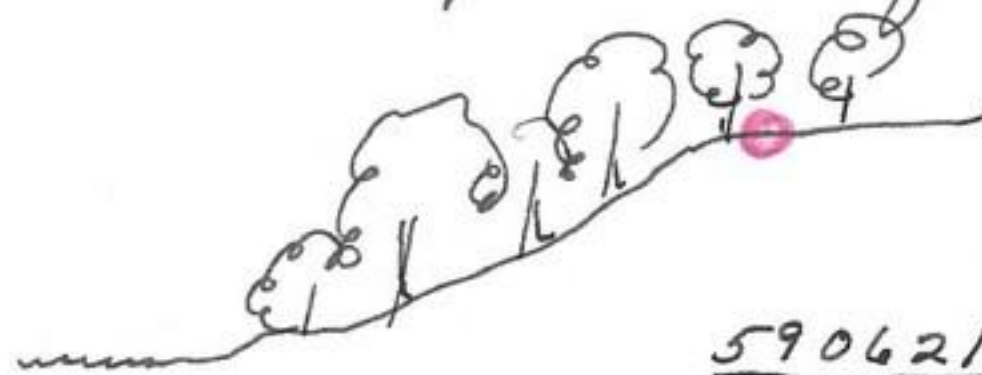


It finally dove into the dove and actually fought the dove at the nest at which time the jay was able to get hold of the young. The young, which measured 118 mm total length and weighed 52 grams, was dropped because of its weight and it lit on a bird feeder 10' below. The jay dropped to the feeder and pecked open holes in the head and neck of the young bird. At this time I scared it away but in about 20 seconds it returned and tried to carry the bird, which it did for about 15' and then it dropped to the ground. The jay would have returned but we intervened. The dove died about 3 minutes later. no action by the dove after the young was taken from her. On the ground were 3 tail feathers, some body feathers of the dove and 1 tail feather of the jay. About 1 hour later the jay returned to within 4 feet of the nest but did not molest the dove. Four days later this pair of doves (?) started to build another nest 30' away in the same tree. The jay started to molest the nesting building jays before they had completed the nest. These doves were finally driven away from this tree. To my knowledge the jays were not nesting in this tree or within at least a hundred feet of the tree although they were commonly seen in the area and could have had a nest in the adjoining yard.

Lone Star Lake, Douglas Co., Kansas

June 21, 1959

Collected specimens from brink of slope bordering Lone Star Lake. Deciduous trees associated. Slope supported many flat rocks but unproductive in snakes and lizards.

590621-1

Thamnophis

590621-2

Small brown snake

590621-3 Eumeces.

This lizard was guarding 4 eggs under a flat rock at edge of hill. There was considerable erosion of scales on back & tail.

590621-4 Bufo, immature.590621-5 Desmophis

Many Rana pipiens approx 1 1/2 inches in length, some as far as 300 feet from water.

590621-6 Bufo3 mi. N Burrton, Harvey Co., Kansas

June 24, 1959

Phil O. Gilvick gave me several specimens from sandunes north of Burrton.

590624-1 Halbrookia maculata, gravid.590624-2

"

"

"

590624-3

"

"

590624-4

"

"

590624-5

Bufo americana woodhousii

590624-6

Cnemidophorus septentrionalis

590624-7

"

"

590624-8

"

"

4 mi N and 1/2 mi. E Lawrence (P.O.), Douglas Co., Kansas

June 24, 1959

Family and I collected following specimens from old rock quarry at top of valley slope. Springs and standing water. Cnemidophorus in open stripped area.

590624-8a? Bufo (Could be a duplicate 8)590624-9

Bufo

590624-10

Cnemidophorus septentrionalis

590624-11

"

"

590624-13

Acris crepitans

590624-14

Bufo

590624-15

"

- 590624-16 Bufo
590624-17 microhyla olivacea
590624-18 microhyla olivacea

marip Lake, 3 mi. S and 1 mi. E Lawrence (P.O.), Douglas Co., Kansas.

June 24, 1959

Son James received two turtles from a friend who collected them at marip Lake.

590624-19 Chelydra serpentina

590624-20 Turtle

590624-21 Bufo from under rock in creek bed.

590624-22 natrix

miami County State Park, miami. Co., Kansas

July 4, 1959

Family spent July 4 and 5 at this lake. Collected:

590704-1 Acris crepitans blanchardi

590704-2 " " "

590704-3 Rana pipiens

590704-4 Thamnophis July 7, 1959 (locality as above)

590707-15 ? Herp

marip Lake, 3 mi. S and 1 mi. E Lawrence (P.O.), Douglas Co., Kansas.

July 8, 1959

James Robert collected the following:

590708-1 natrix

590708-2 Turtle

4 mi. N and 1 1/2 mi. E Lawrence, Douglas Co., Kansas

July 13, 1959

Collected the following

590713-1 Bufo

590713-2 "

590713-3 Acris crepitans blanchardi

590713-4 " " "

590713-5 Crepidophorus septentrionalis

590713-6 Thamnophis

marip Lake, 3 mi. S and 1 mi. E Lawrence (P.O.), Douglas Co., Kansas

July 13, 1959

590713-1 Rana pipiens

590713-2 Acris crepitans

3 mi. N Lawrence (P.O.), Douglas Co., Kansas

July 15, 1959

590715-1 Carphophis

Lawrence, Douglas Co., Kansas

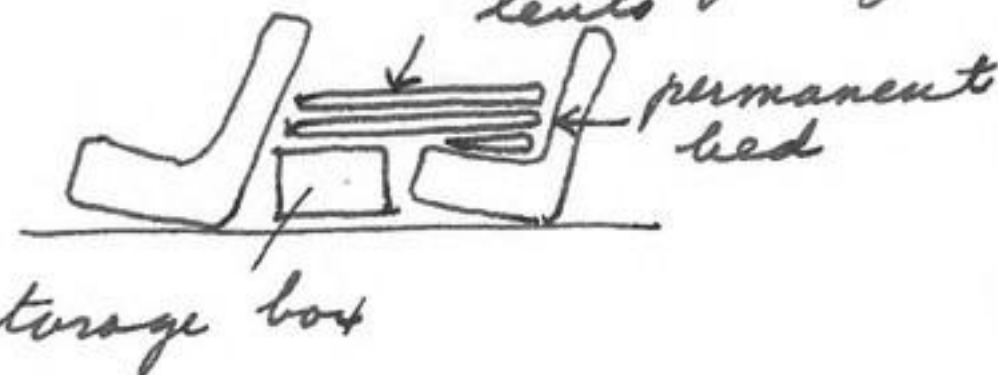
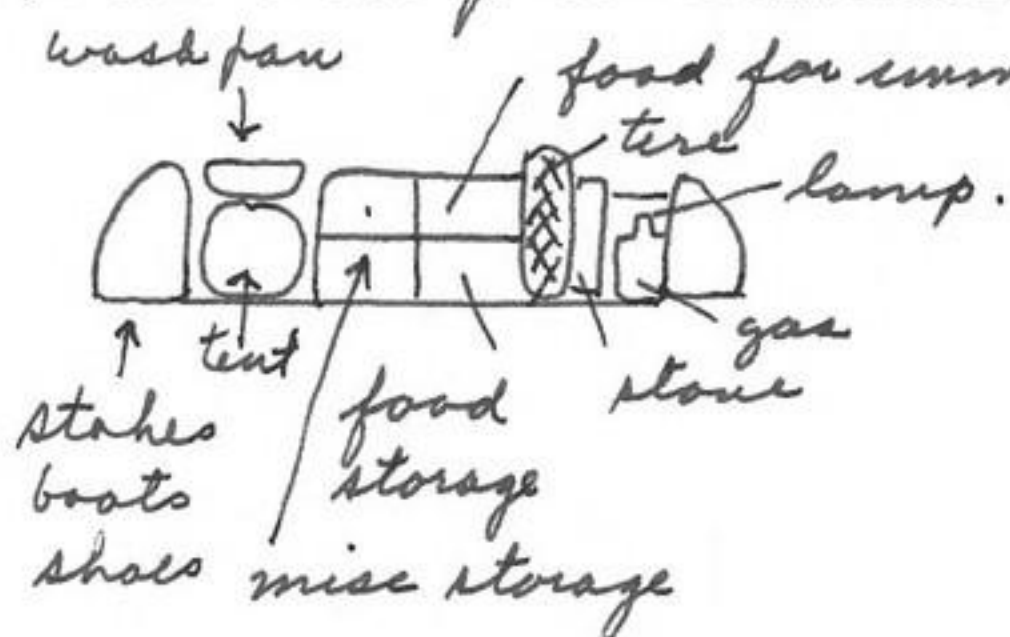
July 26, 1959

Left on vacation to California and Utah. Equipment: mosquito netting for car doors (double like a sock to fit over entire door); car table to fit on dash board for serving meals in front seat; film, exposure meter, camera; gas can; flashlights; spot light and tire light; alarm clock; plastic sacks, dish pan; binoculars; umbrella; thermometer; needle, thread, beeswax; lens for camera; mosquito repellent and lotion; sunburn lotion; aspirin, comb, brush, toothbrush & paste, T.R.O., cleaner; colored glasses, altimeter, 5 gal water can, dipper; food box, sleeping bags; pillows; blankets, wash basin; bag for dirty clothes; water repellent bag for wet clothes, towels, rags, collecting box for keeps; bags, tent, stakes, ropes, hatchet, 22 pistol, fishing tackle, knee boots, bird book, cooking equip - fry pan, kettle for hot water, kettle for soups, extra clothes, shoes, gas stove, lamp, maps, journal, pens. The equipment was organized so that there was easy access to materials most frequently used such as food, tent and sleeping facilities.

Box across entire width of back seat between front and back seat and at a height to form continuous platform for sleeping.

The box should be 3 inches below back seat so that with pressure on seat, the the box and seat will match.

Storage also in back of luggage.



Food for immediate use must be easily accessible, especially at noon meal. Left Lawrence at 11:00 A.M., mileage 67340, full tank of gas. Turnpike to Wichita

at 3:45 P.M. west on 54. at Minnelap got 14 gal. gas at 4.15, mileage 67658 or 22.7 miles per gal. Arrived Meade County Lake State Park at 9:00 P.M. at 67695. Camped here near lake for first night. Wind from lake kept most mosquitos from being active.

Lake Meade State Park, Meade Co., Kansas

July 27, 1959

Left Meade Co., State Park Lake at 7:00 A.M. Mileage 67695.
 It took one hour to break camp. Arrived Tucuman, New Mexico at 1:15 P.M. Mileage 67937, 13 1/10 gal gas at \$4.89. Today 20.5 miles per gal. Arrived Laguna, New Mexico at 8:00 P.M. Mileage 68163.

Laguna, New Mexico

July 28, 1959

Left Laguna 6:00 A.M. Gas at Grant 68195. 12.4 gal at \$4.50. 1 qt of oil. Mileage 20.8 mi. per gal. At this point son James gave his impression of Kansas which we passed through yesterday. "My impression of the part of Kansas we went through was pretty good because we saw a lot of game some of which I had never seen before ~~into~~ in its environment. I also saw some of the game at a fairly close view. I saw a lot of jack rabbits. It's a funny thing but before now I had only seen one jack rabbit in my life. One thing that I hadn't seen was burrowing owls and pheasants. We also saw quail and other game. We saw some peacocks at a game farm. I made a census of birds from Cimarron River south for 10 miles - One kangaroo rat (dead), 2 bank swallows, 9 mourning doves, 10 small sparrows. An estimated number of birds from Meade Co State Lake to 5 miles west is: 12 jack rabbits, 1 cottontail, 5 burrowing owls, 2 pheasants, 15 mourning doves, 7 sparrow hawks, 20 small sparrows, 7 night hawks, 1 meadowlark."

Mary Pauline described the country 10 miles east of the Petrified ^{Forest} National Monument in New Mexico as ". We saw two Indians. There was lots of sagebrush and we saw some petrified wood and dry rivers - where did the water go. There were lots of flat topped mountains and sunflowers. Soil is skin color. Lots of hills. There are no trees except junipers. There are lots of pretty rocks, some red, some white. Some places there ^{are} no rocks but just sand and weeds. The color of the brush is grey-green and some just gray and yellow. The only green is along the side of the road. There is red sandstone with no vegetation growing on it. The solid rock are grey. 60% of soil is sand. Some places there is moving sands." Annette's impression was "We went through

the Painted Desert. The desert is beautiful and has many different colors some parts are red, purple, red-orange, yellow, white and even some places black. Parts of the ground is blue. Photographed the petrified forest (Petrified Forest National Monument, Arizona) 590828-1 family among large boulders; 590828-2 family and petrified wood; 590828-3 Annette & many on large petrified log; 590828-4 family at log and erosion bank; 590828-5 petroglyph of mountain lion. Arrived Flagstaff, Arizona at 4:30 P.M. mileage 68473.6 Bought 13.5 gals of gas at \$5.10. Last tank gave 20.5 miles per gal. Flagstaff is an interesting town and of good size and location being situated in the Ponderosa pine zone. Mt. Humphreys and associated range is nearby and could be conveniently worked biologically. Continued N to Cameron. Only a few inches of water in Little Cottonwood Canyon. Cameron is remote and excellent place to enter canyon for bottom canyon inspection. Returned to turnoff to Grand Canyon. Impressed with possibility of photographing canyon to N from this area. Good view to north of desert. Arrived Desert View at 7:00 P.M., mileage 68666. Photo 590728-1 and 590728-2 and 590728-3 of Canyon at evening. This view point includes desert to north and east as well as canyon to west. Late in evening I went to rim of canyon. No noise of canyon except few crickets. Both jack rabbit and cottontail in area, both foraging at night. Sleeping comfortable.

Desert View, S Rim Grand Canyon, Arizona

July 29, 1959

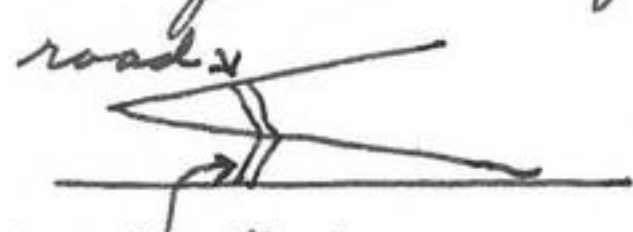
Left 7:00 A.M. for Grand Canyon Lodge. Photo 590729-1 at Moran Point. Good vantage point. Plain titmouse, raven, deer and steller jay noted. A Kaibab squirrel was dead in road, having been hit by a car this A.M. Photo 590728-2 of this squirrel. Area of ponderosa pine and at a point where side road leaves for Grandview Point. Photo 590728-4 on south rim. 590729-5 of meteor at Grand Canyon Lodge. The south side of Grand Canyon gives a nearer view of canyon and river below but is not as high in life zone nor as interesting as the north rim. Left G. Canyon and continued S to Williams, Arizona. Gas 9.5 gal at \$3.68 at 68659. Also changed oil and grease job \$4.50. Gas 19.6 miles per gal. Continued west on highway 66 to Kingman, thence highway ⁹³ to Temple Bar, meade

National Recreation Area where we camped overnight. Temp. over 100°F.

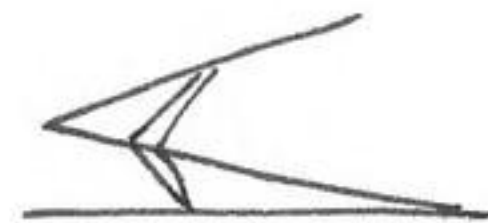
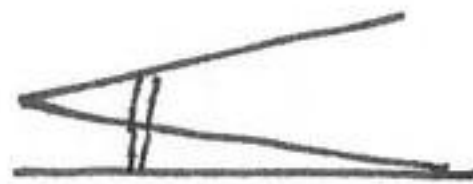
Temple Bar, Lake Meade Natl Recreation Area, Arizona

July 30, 1959

For sleeping the main requirement is to have bed elevated above hot ground which remains uncomfortably hot all night. Lightweight sleeping bag also necessary or light sheet or blanket only. Same problem as keeping cool in Tropics. Photo 590730-1 of children wading at Temple Bar and 590730-2 of Annette and Mary at camp. Swimming perfect. water clear. Left 8:00 A.M. at 68875 mileage. Did not see one individual either going into or from Temple Bar to main highway. Countryside nat influenced by man. many shallow arroyos without bridges but dips; in rainy weather these roads would probably be impassible. Visited Boulder Dam and made tourist inspection of dam facilities. many cars at dam and showing signs of asphyxiation. Country at Boulder Dam shows excellent examples of vulcanism and recent alluvial or out flow plains. It would be an excellent place to spend a summer navigating the canyons below the dam. Considerable activity at lake nearest Boulder City. Continued to Boulder City Temperature cool and entire trip under clouded skies. 119/10 gas at \$4.50 at Boulder City. mileage 68930 at 22.6 miles per gal. At Las Vegas photographed the Lucky Strike Club 590731-1. Visited the Golden Nugget. Continued south on highway 91 to Claremont via Baker, Barstow, San Bernardino etc. A mirage at Calif-Nevada line thus:



reflection



The mirage reflects the area above the mirage. Arrived Claremont 8:00 P.M. mileage 69212 or 1872 miles from Lawrence. Later got gas at 69225 - 12.2 gals at \$3.50. On this mileage basis used 88.9 gals at \$30.97 and 21.2 miles per gallon.

Claremont, California

July 31, 1959

Stayed near Annette's mother's place.

Aug. 1, 1959

To Disneyland. Photo 590801-1 to 590801-3 of James, Annette

many in small cars and of the Matterhorn climbers. Children participated in alpine sledge ride, submarine ride, small car, jungle river, surry rides, omnibus, Santa Fe etc.

Claremont, California

Aug. 2, 1959

Botanical Garden for short visit.

Aug. 3, 1959

Puddingstone Lake for fishing. Photo 590803-1 of James and fish. 590803-2 of Annette and Mary.

Aug. 4, 1959

Visited ^{College} ~~House~~ at Claremont.

Puddingstone Lake W of Claremont, California

Aug. 5, 1959

James fished, Annette and Mary and I circumnavigated lake on foot (2 1/2 hrs) and observed: Western sandpipers, 50; meadowlarks 20; brewer blackbird 60; song sparrows 3; killdeer 20; great blue heron 1; Calif gull 18; mourning dove 7; American coot 2; hummingbird 3; Calif. purple finch 4. Noted several Sceloporus-like lizards, some 6-7 inches long. On approach to Puddingstone Lake to S noted large beavertail cacti on sidehill about 150 x 100 feet in extent.

Claremont, California

July 6, 1959

To Pacific Ocean at Balboa for swim via La Brea Canyon, Anaheim etc. Left 10:15 A.M. at 69378 mi. Returned 8:00 P.M. Mileage 69491 mi or 113 miles. 12 gal gas at \$3.50. Surf at Balboa high as result of hurricane weather in Pacific. Photo 590806-1 of Annette and Mary covered with sand. 590806-2 of Mary & Annette in surf. Also 590806-3 and 590806-4. No 590806-5 of Grandma Maheed, Annette, Chris & Pally. 590806-6 of Annette and Mary in sand. James caught one small smelt or herring from pier. Returned to Claremont.

Claremont, Los Angeles Co., California

July 7, 1959

Left Claremont 2:30 P.M. mileage 69496. Approx 10 gal in tank. Will use 99 and 101 thru Los Angeles. Camped at Camp Gaviota 69662. Arrived 8:00 P.M.

Camp Garvota, California

Aug. 8, 1959

Left Garvota 8:30 A.M. James caught a sand shark last night at about 20 lbs. Photo 590808-1 of boat equipped with spear fishing gear for deep sea fishing. 590808-2 of family - back sides. Gas at San Luis Obispo, 14.8 at \$5.25. Complete bubrication at 69738. At 2:00 P.M. at 14 1/10 mi. S San Simeon photographed 590808-3 of James and ocean front. 590808-4 also James fishing along ocean front. Camped Sunset State Park at 8:00 P.M. at mileage 69943. Covered 281 miles

Camp Sunset State Park, California

Aug. 9, 1959

Left 8:30 A.M. for San Francisco. mileage 69943. visited Henry Cowell Redwood Park. 13.2 gals gas at \$4.63. mileage 69998 at Santa Cruz. Photo 590809-1 of family at Miner National Monument. Camped Miner Beach arriving at 6:00 P.M. at 70112. This evening after dark visited San Francisco via Golden Gate Bridge.

Miner Beach, California

Aug. 10, 1959

Departed 9:10 A.M. at 70142. Visited China Town. Photo 590810-1 of main street. Continued east & west to Fishermans Wharf. Photo 590810-2 there. From San Francisco continued east via highway 50 to Tracy. Got 13.3 gals gas at \$4.50. Mileage 70234. Camped San Joaquin River N.E. of Tracy on main highway.

San Joaquin River, California

Aug. 11, 1959

Departed camp 7:20 A.M. at 70244. Will continue on highway 120 to Yosemite. Gas 11 gals at \$3.94 and 2 qts oil \$1.05 at Crane Flat, Yosemite at 70392. Photo 590811-4 of mt. S of Montgomery Pass. At Tonopah 70588 mileage. Gas 10.4 at \$4.15. Camped at 18 mi. E Tonopah. mileage 70606.

18 mi. E Tonopah, Nevada

Aug. 12, 1959

Departed 7:30 A.M. (Pacific Time) at 70606. Night cool and breezy. Across valley counted 4 roven and 148 horned larks. Arrived Ely 12:00 A.M. at 70759 mileage. Gas 7 9/10 at \$3.00. Only 2 roven

from border of Nevada to 60 miles into Utah. Arrived Hinkley at 70910, 5 rovers on outskirts of town. Excellent sand dunes west of Nephi Junction north of Delta. Arrived Provo at 6:30 P.M. mileage 71020.

Springdell, Provo Canyon, Utah Co., Utah

Aug. 13, 1959

Stayed at Dad's and Grace's home at Springdell in Provo Canyon. Photo 590813-1 and 590813-2 of James Robert and Annette Christine and Mary Pauline at pond. James caught one trout in pond.

Aug. 15, 1959

- Family picnic at Springdell. Recorded the following color photos:
- 590815-1 Robert George Bee and Grace Spear Bee
 - 590815-2 Burnett Culbertson and Annette Bee
 - 590815-3 Dave Evans family
 - 590815-4 James Robert Bee and Annette Christine Bee
 - 590815-5 Edith + David Stimpson
 - 590815-6 Mel Culbertson and Mary Bee Jensen
 - 590815-7 Ray and Freeda Culbertson
 - 590815-8 Don Jensen and Ray Culbertson
 - 590815-9 Susan Culbertson and Mary Bee
 - 590815-10 James Jensen and Ronnie Culbertson

Provo Canyon, Utah County, Utah.

Aug. 17, 1959

Took several photos this A.M.

- 590817-1 Mary Pauline and Annette Christine at Bridalveil Falls.
- 590817-2 The upper falls of Bridalveil Falls.
- 590817-3 Base of upper Bridalveil Falls.
- 590817-4 Mary Pauline and Annette Christine at base of upper Bridalveil Falls.
- 590817-5 Canyon wall to west of upper falls.
- 590817-6 Bridalveil Falls from the north side of Provo Canyon.
- 590817-7 Cliffs west of falls
- 590817-8 Overturn at point west of falls
- 590817-9 Timpanogos to north from above Springdell.
- 590817-10 Petroglyphs at mouth of Provo Canyon on S side
- 590817-11 Another shot of some petroglyphs. These rocks overlook the floor of the canyon below.

Mouth Provo River, Utah Lake, Utah Co., Utah

Aug. 18, 1959

Photos taken while riding in Don Jensen's boat.

- 590818-1 Don Jensen and James Robert Bee
 590818-2 Don Jensen
 590818-3 Annette Christine Bee and Mary Pauline Bee
 590818-4 Mary Pauline Bee.

255 E. 1st So., Provo, Utah Co., Utah

Aug. 19, 1959

Photo at Saynes pool, a neighbor next door.

- 590819-1 James Robert Bee
 590819-2 Don Jensen
 590819-3 Annette P.M. and children.

Salt Lake City, Wasatch, Utah

Aug. 20, 1959

Took the following photo of Mary Ann Bee at Max Bees residence.

- 590820-1 Mary Ann Bee.

Valley View, Pole Canyon, Provo Canyon, Utah Co., Utah.

Aug. 21, 1959

Photo 590821-1 of Dad, Grace & James Bee family on picnic.
 Fossil trees still in area but several defaced.

Springdell, Provo Canyon, Utah Co., Utah

Aug. 22, 1959

Left for Lawrence, Kansas at 11:00 A.M. mileage 71433. Tank with $\frac{1}{2}$ full of gas. Arrived Current Creek via Strawberry Valley at 12:30 P.M. 12 $\frac{1}{10}$ gal gas at \$4.58, mileage 71493. Temp. last night 48°F here. Craig, Colorado at 5:30 P.M. at 71707, 9.5 gas at \$3.55. Camped 3 mi. W Milner arriving 7:00 P.M. at 71736. Camped at edge of Yampa River.

Yampa River Camp, 3 mi. W Milner, Colorado

Aug. 23, 1959

Left 7:30 A.M. and continued E to Steamboat Springs. Arrived Kremmring at 71825 via 131, 84. Continued to west side Rocky Mountain Nat'l Park. Just a few miles west of Continental divide recorded several color photos.

- 590823-1 Annette Christine and Mary Pauline west of divide

showing timberline on opposite side of glaciated canyon. Protection from wind is a major factor in governing timberline. Soils and drainage control growth in bottom of canyons and on glaciated benchland above timberline

590823-2 Cornice near divide. Color Arctic but vegetation not as luxuriant

590823-3 Bee family near divide on wind swept flat.

590823-4 East from divide

590823-5 West from divide

590823-6 James, Mary and Annette C east of divide

590823-7 Cornice and James, Mary & Annette C east of divide

590823-8 Cornice east of divide. All on Continental divide in the Rocky Mountain National Park.

Continued to Estes Park, thence Boulder, Colorado. Gas 15.6 at \$4.40, mileage 71958. Continued to Denver, thence east to 6 mi NW Agate, Colorado where we made camp. mileage 72050.

6 mi NW Agate, Colorado (Highway 40)

Aug. 24, 1959

Left 5:30 A.M. (Mt. Time). At 8 1/2 mi NW Hugo on highway 40, noted a badger walking along fence. Area of grazed buffalo grass. A prairie falcon investigated the badger but did not attack. Arrived Kansas border 9:40 A.M. at 72185 (Mt. St. Time). 15 Swainson hawks from 10 miles west of Firstview, Colorado to border of Kansas. There were only an occasional hawk noted before or beyond this point. First roven 4 mi. W Oakley. Gas \$4.45 - 14 4/10 gals. Left 11:40 A.M. Salina 4:00 P.M. at 72447. 81 to 18 highway, thence to Topeka. Gas at Junction City, 72504, 12.4 gals at \$3.84. Arrived Lawrence, Kansas at 8:00 P.M. at 72502.

Lawrence, Douglas Co., Kansas

Aug. 25, 1959

Photos at 1620 Tennessee Street

590825-1 House

590825-2 "

590825-3 Annette P.M. on front porch

590825-4 " " and door insignia

590825-5 From house to west across street (Maupins home)

Museum Natural History, K.U., Lawrence, Douglas Co., Kansas

Oct 8, 1959

Photo and article in Daily Kansan today about mice and genetics laboratory.

Lawrence, Douglas Co., Kansas

Oct 10, 1959

Photo 591010-1 of Mary Pauline and Annette Christie at base of tree east of our home at 1620 Tennessee St. We have other photos of this same tree in autumn colors taken several years ago when James Robert & Annette C were small children.

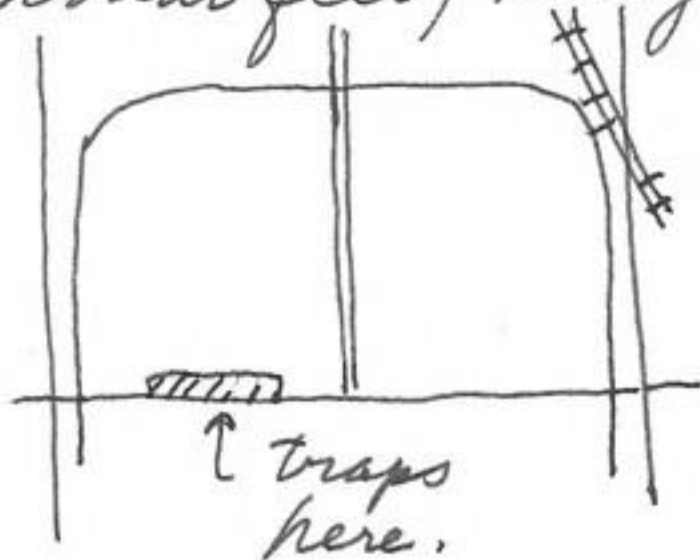
Nov. 26, 1959

Photo of Annette C and Mary P 591126-1 with hair styled by my sister Mary from Provo. Mary was visiting us for Thanksgiving day.

Hasell Bottoms, S Lawrence, Douglas Co., Kansas

Dec. 7, 1959

In the area confined within dike system of Hasell Bottoms are 100 head of cattle which have been grazing for at least one month and have reduced the vegetation as much as 95%, especially in areas near water. In areas where live traps had been set a month ago in vegetation too rank to see trails and had yielded 100% catch of *Sigmodon*, *Microtus ochrogaster* and *Peromyscus maniculatus*, were now completely eradicated of these small mammals and the vegetation had been eaten to the ground. I would estimate that in the area of the dikes (see previous estimation of numbers) the small mammal population had been reduced 90%. Fence lines contained slightly more *Sigmodons* than 2 months ago but not in numbers one would expect of animals having been driven from the fields by the cattle. From the south fence line (traps 16 in number placed 40' apart in 640 linear feet) caught 14 *Sigmodons* & one *Peromyscus maniculatus*.

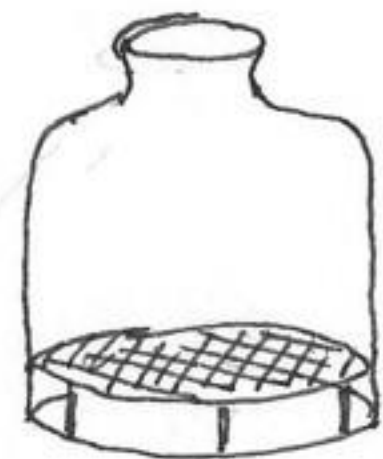


The vegetation was grazed up to the fence on the field side but not touched on the road side. 5 feet of grasses separated the fence from the road proper.

The measurement of these mammals are:

591207-1 ♂	<i>Sigmodon hispidus</i>	231-90-31-18-85 gms	testis 5 mm
591207-2 ♂	"	220-88-30-17-67 gms	" 5 "
591207-3 ♂	"	231-86-30-17-82 gms	" 5 "
591207-4 ♀	"	224-92-30-17-64 gms	ovary 1/2 mm
591207-5 ♀	"	198-80-28-15-51 gms	" 1/2 mm
591207-6 ♂	"	267-102-33-19-109 gms	
591207-7 ♂	"	242-94-31-19-92 gms	testis 6 mm
591207-8 ♂	"	272-110-32-18-105 gms	" 6 "
591207-9 ♀	"	175-78 (7) (7) 62 gms	
591207-10 ♂	"	251-(7)-(7)-(7) 106 gms	
591207-11 ♀	"	190	76 gms
591207-12 ♂	"	242-94-31-19-92 gms	testis 6 mm

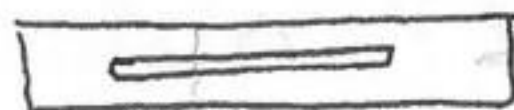
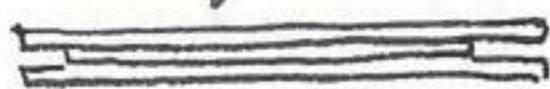
Today started a colony of dermestid beetles (approx 30 and some larvae adults). Container a gallon jar without a bottom and a wire platform 1 inch above the bottom. A sponge was placed on floor of cage or bottle as a source of moisture. Top covered with cheesecloth.



Museum Natural History, K.U., Lawrence, Douglas Co., Kansas
Dec. 8, 1959

Placed 2 larvae in a vial to check growth (Dermestids)
Dec. 9, 1959

Placed two microscope slides together with a partition the width of slide or near 1/2 the width and bound with masking tape



at 2:00 P.M. By 3:00 P.M. 2

sets of eggs were deposited between

the slides, one set of 6 and another set of 18, each set in two separate parts of the slide. By 5:00 P.M. three more sets of eggs of about 12 each, after which eggs continued to be deposited. These slides were set inside a jar (see Jan 7 notes). A fresh *Peromyscus* carcass which was placed in jar yesterday was now wet and smelly but not eaten except by an occasional beetle; they were more interested in the prepared food.

1

Dec. 10, 1959

Eggs being continuously deposited between slides where adults cannot reach. No adult mortality. Eggs were now completely bordering the edge of the slide.

10

Dec 13, 1959

First eggs were hatching today. Eggs still being deposited on between the slides. A new slide was placed in the jar but egg laying there slow, only two sets of eggs were deposited where - as on the first slide a dozen or so were placed in the same period of time. Larvae remained between slides.

Dec 15, 1959

most of the larvae have now moved from the microscope slide and have taken a position on the bottom of the jar. Only 5 sets of eggs on new slide indicating a slowing down of egg laying. A skull of a freshly killed *Peromyscus* was cleaned (90%) overnight by both adults and small larvae but only when placed on the floor of the jar. It is impractical to keep floor clean because of the small larvae that remain there. It is planned to use regular jar and let debris accumulate in bottom and then clean at intervals. A heat source might drive the larvae to the upper levels and if such a control can be installed, the debris that accumulates on the floor from the feeding activity of the dermestids on the skulls above will fall to the floor. The young remain on the floor while adults climb upward in search of food. Moisture and new food initiates breeding. Too much food causes a mold to develop on the food. The larvae placed in vials several days ago (see notes) are now 3 mm in length and have cast at least one skin since placed in the jar Dec. 8, 1959. The adult beetles become nervous when food is removed for a short period of time.

Dec 18, 1959

Placed entire colony of dermestids in a new jar (1 gallon) with an alcohol lamp and wick for moisture control. Also placed 8 slides for deposition of eggs on food in bottom of jar. Plan on letting debris accumulate there and then periodically clean. These slides are separated the width of the eggs.

Dec 19, 1959

5 batches of eggs on slides, most of them at point where masking tape held the slides together, indicating a preference for semi-dark areas of the slide. This would also indicate that the females discern difference between dark & light areas. Slides should be made of dark glass. After the *Peromyscus* skull was soaked in water, there was increased activity in cleaning the remaining tissue.

Dec. 28, 1959

In the last 10 days there has been a recession of egg laying and a decrease in activity of adults. 80% of adults were dead including some young adults. This death could have been from normal longevity or an extra hot room when a radiator came on yesterday.

Museum Natural History; Univ Kansas, Lawrence, Kansas

Dec. 29, 1959

From a record of ^{4 toad} frog calls made the following comparisons of their calls: *Hyla gratiosa* (Barking Treefrog), bark, hitting a hollow container at regular intervals.

Bufo t. terrestris (Southern Toad), trill, upward cadence.

Hyla c. cinerea (Green Treefrog), Old fashion horn honking, sometimes ending with a sandhill crane call.

Microhyla carolinensis (Eastern narrow-mouth frog), bagpipe 4-6 seconds; traffic jam (horns).

Acris gryllus dorsalis (Cricket frog), telegraph signal, variable in rhythm & clicking.

Rana grylis (Pig frog), snort of pig.

Rana pipiens (Leopard frog), sucking balloon and a croak.

Rana c. capito (Florida Gopher frog), ~~drone~~ droning variable motor boat, snoring.

Bufo quercus (oak toad), chickpeep, whistledike.

Bufo punctatus (red-spotted toad), high trill, stops abruptly, run down and at end sometimes.

Bufo woodhousei fawleri (Fawlers Woodhouse Toad), medium trill; weird trill.

Bufo americanus (American toad) trill.

Hyla v. versicolor (Eastern gray treefrog); vibrating sandhill crane call in ~~last part~~ east; trill in west; 2 seconds duration.

Hyla arenicolor (Canyon treefrog), low vibrating call.

Bufo b. borealis (boreal toad), warbling and chucking.

Bufo alvarius (Colorado river toad) warbling, talking, chucking.

Rana c. clamitans (bronze frog) warbling, humming.

Hyla andersoni (pine barren treefrog) call answered.

Hyla microscina (Nayarit treefrog) quack of duck

Hyla bandini (Mexican treefrog) horn

Hyla crucifer (spring peeper) clear whistle.

Pseudacris nigrita triseriata (western chorus frog), clicking

or running finger along teeth of comb.

Scaphiopus couchi (Couch's Spadefoot) "ma"

Leptodactylus melanotus (Mexican Kner frog) Clicking.

Bufo cognatus (Great Plains toad) Castanettes.

Rana virgatipes (Carpenter frog) Hammering nail into skin

Rana heckscheri (river frog) growl-like.