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The Flora of The Tasco Lake Region, Sheridan County, Kansas

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A Thesis Submitted
to the Department of Botany
and the Graduate Council of the
Fort Hays Kansas State College in
Partial Fulfillment of the Requirements
for the Degree of Master of Science.

by

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FORT HAYS KANSAS STATE COLLEGE
1935

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Raymond W. Darland

7/9/36

I. Introduction

It has been customary in writing theses dealing with taxonomic problems to collect data from an entire county. Having had occasion to collect botanical specimens from the Tasco Lake for work in biology at the Sheridan High School, the wealth of plant life to be found here became apparent. The area ranges from xerophytic forms on the uplands to the hydrophytic forms in the lake and marshes. Many of the latter have never been reported from Western Kansas. Collections in preserving fluid were made of the water forms found and specimens of the land forms were mounted on regulation sized sheets properly classified. Duplicate specimens of both were presented to the Botany Department of the Fort Hays Kansas State College.

The investigation covering a period of twenty months, comprising the growing seasons of 1934 and 1935, has made possible a thorough study of the flora of this region. So far as is known, no detailed study has been made of this area; and, moreover, this will hold for most of Western Kansas, which therefore presents a fertile field for the investigator.

II. Purpose

It can be said without question that Western Kansas botanical studies have been very few and that much in the way of valuable botanical research is now needed. The result is that many erroneous ideas are prevalent in other states in regard to our plains region. This is due to the lack of scientific information based upon careful study. In all probability there is no other half section in Western Kansas where plant life would be any more constant and represent so large a number of species as the one reported upon in this thesis. This is due mainly to the topography, types of soil, and abundant water supply as a result of the perpetual springs and the 6.5-acre lake completed in 1925.

The survey of plant life of this particular area was taken for the following reasons: (1) to add to the information concerning the taxonomy of Western Kansas plantlife; (2) to make an intensive study of a small area where there is an abundance and wide variety of xerophytic, mesophytic, and hydrophytic plant life.

III. Acknowledgments

In the preparation of this study the writer has become greatly indebted to the following members of the Fort Hays Kansas State College faculty for many helpful suggestions and much advice: Professor A. W. Barton for direction in the research and writing of the thesis; Professor L. D. Wooster for stimulus and encouragement in the study of biology; and Professor F. B. Streeter for helpful suggestions in the bibliography. Much helpful information has been obtained from the research of the Rev. Clement Weber of Selden, Kansas, who collected plants in Sheridan County during 1930, 1931, and 1932.

IV. Description of Area

1. Location:

The tract of land under consideration consists of approximately 320 acres, being the north-half of section 14, township 8, range 27 west of the 6th principal meridian in Sheridan County, Kansas. The area is approximately a half mile north of the town of Tasco which is on the Salina-Oakley Branch of the Union Pacific Railroad; bounded on the south by the United States Highway North 40 and is seven miles due east of Hoxie, the county seat.

2. History:

The 320 acres comprising the Tasco Lake region were owned by F. W. Houseworth from 1899 up to the time of his death in 1933. Mrs. Houseworth, now living in Hoxie, is the present owner of the land. Cortez Creek flows through the northern portion of the property. A dam was constructed across this creek but later was washed out. In 1925 Mr. Houseworth completed the present dam across the creek at a cost of approximately \$2100. The dam formed a 6.5 acre lake around which were set many cottonwood trees. After the completion of the dam a dance hall, a swimming pool, and a baseball park were constructed. These were operated very successfully up to the time of Mr. Houseworth's death, since which time the park has not been operated. In 1934 the Outdoor Life Club,

composed mostly of Hoxie business men and their families, secured a five year lease on the lake and its immediate surroundings for hunting, fishing, and recreational purposes. The lake has been well stocked with fish such as Bass, Blue-gill, etc. Ducks and pheasants have been very abundant.

3. Natural Features and Climatic Conditions:

The altitude of the Tasco Lake region is approximately 2496 feet above sea level and according to the Kansas Geological Survey the county is covered with a thick deposit of Tertiary Ogalolla formation. The area is practically level with the exception of two small hills along the northern boundary and a rather large hill extending along the western boundary. The 80 acres on the west are mostly in pasture while a large portion of the bottom land is under cultivation, the major crop being corn.

In this part of the county the cretaceous chalk beds form the country rock underneath the sandy loam soil. The area has many perpetual springs which are evidently from the Rocky Mountain underflow known to underlie the entire county. Some of these springs are the source of the water forming Cortez Creek which has its origin close to the northern boundary of the half-section. A large spring below the dam produces approximately 7500

gallons per day by actual measurement and has never been known to go dry or even vary in its flow. A well dug about four miles northeast struck an underground river below the surface which river had a depth of 20 feet.

This abundance of underground water and the continual slope of the county toward the east tends somewhat to explain the presence of the many springs. In many places over the area water is only a few feet below the surface. This is very important to plant life in dry years. In the drouth year of 1934, plants grew abundantly in most of the area and as a result this area was about the only green place to be found in the county. The rainfall of Sheridan County has varied from 33.13 inches in 1930 to 9.51 inches in 1934 as is shown by the chart for the ten-year period on the following page.

The South Solomon River flows across the east portion of the half-section. The river in this locality is small and only a small portion of the water is at the surface. The major part of the flow seems to be down within the sand of the river bed. Cortez Creek previously mentioned in the History of the region forms the outlet for the lake and empties into the river due east of the lake. The 6.5 acre lake formed by the dam across Cortez Creek has a maximum depth of 15 feet. The still, shallow water at the edge of the lake forms a wonderful habitat for an abundance of plant life.

Precipitation at Hoxie, Kansas (in inches)

Month	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Jan.	0.05	0.15	T.	0.25	0.42	0.00	1.16	0.00	0.00	T.
Feb.	0.07	0.80	2.44	0.43	0.47	1.87	0.59	0.05	1.82	0.18
Mar.	0.26	2.20	1.93	0.10	0.10	3.70	1.06	0.42	0.57	0.15
Apr.	0.66	2.35	0.12	2.39	3.23	1.96	1.96	1.48	0.24	0.46
May	1.67	0.93	4.00	2.11	4.66	0.57	1.44	2.94	1.37	3.67
June	3.29	4.48	5.91	2.83	5.71	1.41	3.23	1.84	2.15	2.73
July	2.14	2.23	4.91	2.01	2.32	4.45	2.06	1.45	0.15	0.28
Aug.	2.20	4.46	0.40	1.32	4.74	2.21	0.86	4.11	1.28	0.69
Sept.	1.55	1.05	2.33	1.71	1.64	0.15	1.62	0.57	0.67	3.25
Oct.	0.05	0.42	4.27	2.24	7.39	1.21	0.39	0.38	0.21	0.21
Nov.	0.72	0.30	0.80	2.05	2.45	1.79	0.20	0.93	0.86	1.01
Dec.	0.60	0.03	T.	0.00	T.	0.14	0.24	1.48	0.19	0.12
Total	13.26	19.40	27.11	17.44	33.13	19.50	14.81	15.65	9.51	12.75

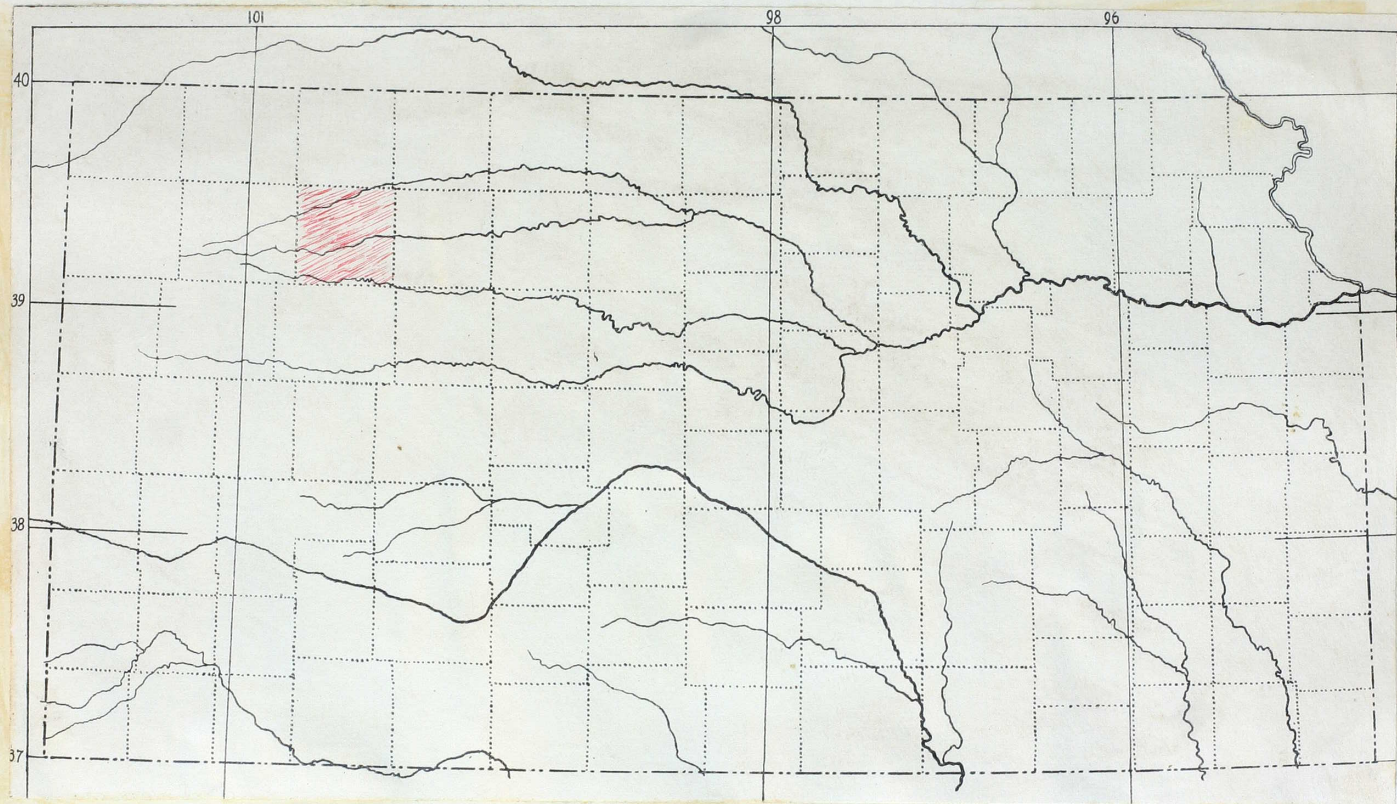


Fig. 1. A map of Kansas showing the location of Sheridan County.



Fig. 3. A view of the area as seen from the western boundary.

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Fig. 4. A view of the dam showing the road formed.

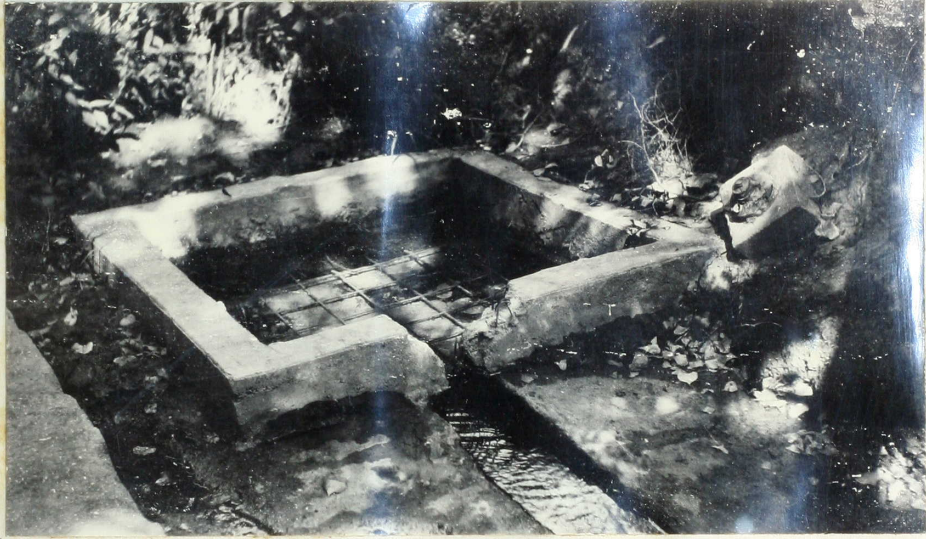


Fig. 5. The big spring.



Fig. 6. A small portion of the vegetation covering the lower side of the dam.



Fig. 7. The lake as viewed from the southeast.



Fig. 8. The lake as viewed from the east.



Fig. 9. The upper portion of the lake as viewed
from the west.



Fig. 10. The Solomon River near the eastern boundary.



Fig. 11. The gullies in the west pasture.



Fig. 12. A view of the meadow west of the lake
along Cortez Creek.



Fig. 13. Mortar-bed rock in the west pasture.



Fig. 14. Xerophytic vegetation near the western boundary.

V. Sheridan County Flora

1. Previous work:

Clement Weber of Selden reported that previous to 1898 Professor A. S. Hitchcock of the Kansas State Agricultural College of Manhattan published a list of Sheridan County, which contained 146 plants. In the 1932 Transactions of the Kansas Academy of Science, volume 35, Clement Weber reported 476 plants gathered during 1930, 1931, and 1932. Actual specimens of the plants reported were presented to the Kansas State Agricultural College of Manhattan and can be found there at this time catalogued as the Sheridan County herbarium. No mention of the cryptogams was made in either of these reports.

As the plants in the previous studies were gathered at random over the entire county and no study of any particular locality was made the survey of the Tasco Lake region seemed justified.

2. Taxonomix List of Species:

a. Cryptogams

Chalamydomonas tingens
Cladolphera glomerata
Closterium striolatum
Conferva bambycina
Conferva fontanalis
Drepernaldia plumosa
Encyonema ventricosa
Equisetum fluviatile
Equisetum laevigatum
Gleocapsa magma
Navicula gracilis
Navicula viridis
Nitzschia lanceolata
Oscillatoria anguina
Oscillatoria leptotricha
Oscillatoria major
Oscillatoria princeps
Pandorian morum
Pleurosigma intermedium
Spirogyra adnata
Spirogyra calospora
Spirogyra decimina
Spirogyra flavescens
Spirogyra mirabile
Spirogyra punctata

Spirogyra quinina

Spirogyra tenuissima

Spirogyra varians

Stigeoclonium fastigiata

Synedra biceps

Synedra valens

Zygnema leiospermum

Charophyceae - Charophyta Family

Chara alismifolia - Prostrate chara
Chara fragilis - Upright chara
Chara hydrocotylifolia - Upright chara
Chara polymorpha - Upright chara

Charophyceae - Equisetum Family

Chara aculeolata - Eastern chara
Chara fragilis - Upright chara
Chara hydrocotylifolia - Upright chara
Chara polymorpha - Upright chara
Chara trichocarpa - Upright chara

Charophyceae - Chara Family

Chara aculeolata - Eastern chara
Chara fragilis - Upright chara
Chara hydrocotylifolia - Upright chara
Chara polymorpha - Upright chara
Chara trichocarpa - Upright chara

b. Phanerogams

Alismaceae--Water-Plantain Family

Sagittaria cuneata-----Arum-leaved Arrow-head

Alsinaceae--Chickweed Family

Alsine media-----Common Chickweed

Arenaria texana-----Texas Sandwort

Amaranthaceae--Amaranth Family

Amaranthus blitoides-----Prostrate Amaranth

Amaranthus graecizans-----Tumbleweed

Amaranthus hybridus-----Spleen Amaranth

Amaranthus retroflexus-----Red Root

Ambrosiaceae--Ragweed Family

Ambrosia psilostachya-----Western Ragweed

Ambrosia trifida-----Giant Ragweed

Gaertneria tormentosa-----Woolly Ragweed

Iva xanthiifolia-----Burweed Marsh Elder

Xanthium commune-----Cocklebur

Ammiaceae--Carrot Family

Apium petroselinum-----Common Parsley

Berula erecta-----Water Parsnip

Cogswellia orientalis-----White Flowered Parsley

Sanicula canadensis-----Snake-root

Amygdalaceae--Plum Family

Padus nana-----Choke Cherry
Prunus americana-----Wild Yellow or Red Plum

Anacardiaceae--Sumac Family

Schmaltzia trilobata-----Ill-scented Sumac
Toxicodendron radicans-----Poison Ivy

Apocynaceae--Dogbane Family

Apocynum cannabinum-----Indian Hemp

Asclepiadaceae--Milkweed Family

Acerates angustifolia-----Narrow-leaved Milkweed
Acerates viridiflora-----Green Milkweed
Asclepias arenaria-----Sand Milkweed
Asclepias incarnata-----Swamp Milkweed
Asclepias latifolia-----Broad-leaved Milkweed
Asclepias pumila-----Low Milkweed
Asclepias speciosa-----Showy Milkweed
Asclepias syriaca-----Common Milkweed

Boraginaceae--Borage Family

Cryptantha crassisepala-----Thick Sepaled Cryptanthe
Lappula heterosperma-----Hairy Stickweed
Lithospermum linearifolium-----Narrow-leaved Puccoon
Onosmodium occidentale-----Western False Gromwell

Cactaceae--Cactus Family

Coryphanta missouriensis-----Nipple Cactus
Coryphanta viuipara-----Purple Cactus
Opuntia fragilis-----Brittle Opuntia
Opuntia humifusa-----Western Prickly Pear

Campanulaceae--Bellflower Family

Specularia perfoliata-----Venus' Looking-glass

Capparidaceae--Caper Family

Cleome serrulata-----Pink Cleome
Polanisia trachysperma-----Clammy Weed

Caprifoliaceae--Honeysuckle Family

Symphoricarpos occidentalis-----Wolfberry

Ceratophyllaceae--Hornwort Family

Ceratophyllum demersum-----Hornweed

Chenopodiaceae--Goosefoot Family

Chenopodium album-----Lamb's Quarters
Chenopodium hybridum-----Maple-leaved Goosefoot
Chenopodium incanum-----Mealy Goosefoot
Chenopodium leptophyllum-----Narrow-leaved Goosefoot
Kochia scoparia-----Fireball
Salsola pestifer-----Russian Thistle

Cichoriaceae--Chicory Family

Agoseris cuspidata-----Prairie False Dandelion
Lactuca ludoviciana-----Western Lettuce
Lactuca pulchella-----Blue Lettuce
Lactuca virosa-----Wild Lettuce
Leontodon taraxacum-----Dandelion
Lygodesmia juncea-----Rush-like Lygodesmia

Commelinaceae--Spiderwort Family

Tradescantia occidentalis-----Western Spiderwort

Compositaceae--Thistle Family

Artemisia dracunculoides-----Linear-leaved Wormwood
Artemisia filifolia-----Silvery Wormwood
Artemisia frigida-----Wormwood Sage
Aster multiflorus-----White Wreath Aster
Aster salicifolius-----Willow Aster
Bidens frondosa-----Beggarticks
Boebera papposa-----Fetid Marigold
Cirsium ochrocentrum-----Yellow Spined Thistle
Cirsium undulatum-----Wavy-leaved Thistle
Echinaceae angustifolia-----Purple Coneflower
Gaillardia pulchella-----Showy Gaillardia
Grindelia squarrosa-----Gum Plant
Gutierrezia sarothrae-----Broom Weed
Helianthus annuus-----Common Sunflower

Helianthus maximiliana-----Maximilian's Sunflower
Helianthus petiolaris-----Prairie Sunflower
Helianthus tuberosus-----Jerusalem Artichoke
Heterotheca subaxillaris-----Heterotheca
Kuhnia eupatorioides-----False Boneset
Lacinaria punctata-----Dotted Blazing Star
Leptilon canadense-----Mare's-tail
Leucelene ericoides-----Rose Heath Aster
Ratibida columnaris-----Prairie Coneflower
Senecio riddellii-----Groundsel
Sideranthus spinulosus-----Cut-leaved Sideranthus
Silphium laciniatum-----Compass Plant
Solidago glaberrima-----Missouri Goldenrod
Solidago lindheimeriana-----Lindheimer's Goldenrod
Solidago rigida-----Stiff-leaved Goldenrod
Solidago serotina-----Late Goldenrod
Tetraneuris stenophylla-----Narrow-leaved Tetraneuris
Thelesperma gracile-----Rayless Thelesperma
Townsendia exscapa-----Low Townsendia
Vernonia baldwinii-----Baldwin's Ironweed

Convallariaceae--Lily-of-the-Valley Family

Asparagus officinalis-----Asparagus
Vagnera stellata-----False Solomon's Seal

Convolvulaceae--Morning-Glory Family

Convolvulus arvensis-----Field Bindweed

Convolvulus sepium-----Hedge Bindweed
Evolvulus nuttallianus-----Small Silky Morning Glory
Ipomoea leptophylla-----Bush Morning Glory

Corrigiolaceae--Whitlowwort Family

Paronychia jamesii-----James' Whitlowwort

Cruciferaceae--Mustard Family

Bursa bursa-pastoris-----Shepherd's Purse
Cheirinia aspera-----Western Wallflower
Draba caroliniana-----Carolina Whitlow Grass
Lepidium virginicum-----Wild Peppergrass
Radicula sinuata-----Spreading Yellow Cress
Stanleya pinnata-----Stanleya
Sisymbrium nasturtium-aquaticum-----True Water Cress
Thlaspi arvense-----Field Penny-cress

Cucurbitaceae--Gourd Family

Pepo foetidissima-----Missouri Gourd

Cuscutaceae--Dodder Family

Cuscuta arvensis-----Field Dodder

Cyperaceae--Sedge Family

Carex gravida-----Heavy Sedge
Carex hystericina-----Porcupine Sedge
Cyperus houghtoni-----Houghton's Cyperus

Cyperus inflexus-----Awned Cyperus
 Cyperus strigosus-----Straw-colored Cyperus
 Fimbristylis puberula-----Hairy Fimbristylis
 Scirpus americanus-----Three-square Rush
 Scirpus validus-----American Great Bulrush

Euphorbiaceae--Spurge Family

Chamaesyce preslii-----Upright Spotted Spurge
 Chamaesyce serpens-----Round-leaved Spreading Spurge
 Croton texensis-----Texas Croton
 Dichrophyllum marginatum-----Snow-on-the-Mountain
 Poinsettia cuphosperma-----Warty Spurge
 Poinsettia dentata-----Toothed Spurge
 Tithymalus missouriensis-----Reticulate Seeded Spurge
 Zygophyllum hexagonum-----Angled Spurge

Fabaceae--Pea Family

Amorpha fruticosa-----False indigo
 Astragalus missouriensis-----Missouri Milk Vetch
 Astragalus mollissimus-----Woolly Loco
 Astragalus pectinatus-----Narrow-leaved Milk Vetch
 Astragalus racemosus-----Racemose Milk Vetch
 Geoprumnon mexicanum-----Larger Ground Plum
 Glycyrrhiza lepidota-----Wild Licorice
 Medicago sativa-----Alfalfa
 Melilotus alba-----White Sweet Clover
 Melilotus officinalis-----Yellow Sweet Clover

Oxytropis lamberti-----Stemless Loco
Parosela aurea-----Golden Parosela
Parosela enneandra-----Slender Parosela
Petalostemum oligophyllum-----White Prairie Clover
Petalostemum purpureum-----Purple Prairie Clover
Psoralia argophylla-----Silverleaf Psoralia
Psoralia cuspidata-----Large Bracted Psoralia
Psoralia esculenta-----Indian Breadroot
Psoralia tenuiflora-----Few-flowered Psoralia
Strophostyles pauciflora-----Small Wild Bean

Graminaceae--Grass Family

Agropyron smithii-----Western Wheat-grass
Andropogon furcatus-----Big Blue-stem
Aristida purpurea-----Aristida
Atheropogon curtispendus-----Tall Grama-grass
Bouteloua oligostachya-----Grama-grass
Bromus arvensis-----Field Chess or Brome
Bromus tectorum-----Downy Brome-grass
Bulbilus dactyloides-----Buffalo-grass
Cenchrus pauciflorus-----Cenchrus
Chaetochloa glauca-----Yellow Foxtail
Chaetochloa viridis-----Green Foxtail grass
Eatonia obtusata-----Early Bunch Grass
Echinochloa crus-galli-----Barnyard-grass
Elymus canadensis-----Nodding Wild Rye
Elymus virginicus-----Virginia Wild Rye

Eragrostis curtipedicellata---Short-stalked Love-grass
Eragrostis frankii-----Frank's Love-grass
Eragrostis major-----Strong-scented Love-grass
Homalocenchrus orzoides-----Rice Cut-grass
Hordeum jubatum-----Squirrel-tail Grass
Hordeum pusillum-----Little Barley
Koeleria cristata-----Koeler's-grass
Munroa squarrosa-----False Buffalo-grass
Muhlenbergia racemosa-----Wild Timothy
Panicum capillare-----Witch-grass
Panicum virgatum-----Wild Red-top
Poa pratensis-----Kentucky Blue-grass
Schizachyrium scoparium-----Broom Beard-grass
Setaria viridis-----Foxtail
Sorghastrum nutans-----Indian Grass
Spartina michauxiana-----Tall Marsh-grass
Sporobolus asperifolius-----Rough-leaved Dropseed
Sporobolus cryptandrus-----Sand Dropseed

Grossulariaceae--Gooseberry Family

Ribes odoratum-----Golden Currant

Haloragidaceae--Water-Milfoil Family

Myriophyllum pinnatum-----Pinnate Water Milfoil

Hydrophyllaceae--Water-leaf Family

Nyctelea nyctelea-----Nyctelea

Juncaceae--Rush Family

- Juncus tenuis-----Slender Rush
Juncus torreyi-----Torrey's Rush
Juncus scirpoides-----Scirpus-like Rush

Lemnaceae--Duckweed Family

- Spirodela polyrhiza-----Greater Duckweed
Wolffia columbiana-----Columbia Wolffia

Labiatae--Mint Family

- Lycopus americanus-----Water Hoarhound
Marrubium vulgare-----Common Hoarhound
Salvia lanceifolia-----Lance-leaved Salvia
Salvia pitcheri-----Pitcher's Sage
Scutellaria lateriflora-----Blue Skullcap

Liliaceae--Lily Family

- Allium nuttallii-----Nuttall's Wild Onion
Yucca glauca-----Soapweed

Linaceae--Flax Family

- Linum lewisii-----Lewis' Wild Flax

Loasaceae--Evening Star Family

- Mentzelia oligosperma-----Stick Leaf

Lobeliaceae--Lobelia Family

Lobelia cardinalis-----Cardinal Flower

Lobelia siphilitica-----Great Blue Lobelia

Lythraceae--Loosestrife Family

Lythrum alatum-----Loosestrife

Malvaceae--Mallow Family

Callirhoe involucrata-----Purple Poppy Mallow

Malva rotundifolia-----Dwarf Mallow

Malvastrum coccineum-----Red False Mallow

Martyniaceae--Unicorn-Plant Family

Martynia louisiana-----Devil's Claws

Mimosaceae--Mimosa Family

Acuan illinoensis-----Illinois Mimosa

Morongia uncinata-----Sensitive Brier

Moraceae--Mulberry Family

Morus rubra-----Red Mulberry

Nyctaginaceae--Four-o'clock Family

Allionia linearis-----Narrow-leaved Umbrellawort

Allionia nyctaginea-----Heart-leaved Umbrellawort

Oleaceae--Olive Family

Fraxinus americana-----Ash

Onagraceae--Evening-Primrose Family

Epilobium coloratum-----Purple-leaved Willow Herb

Epilobium lineare-----Willow Herb

Galpinsia lavendulaefolia-----Lavender-leaved Primrose

Gaura coccinea-----Scarlet Gaura

Gaura parviflora-----Small-flowered Gaura

Gaurella canescens-----Spotted Spurge

Meriolix serrulata-----Tooth-leaved Primrose

Oenothera biennis-----Common Evening Primrose

Stenosiphon linifolium-----Flax-leaved Stenosiphon

Oxalidaceae--Wood-sorrel Family

Xanthoxalis stricta-----Yellow Wood Sorrel

Papaveraceae--Poppy Family

Argemone intermedia-----Prickly Poppy

Plantaginaceae--Plantain Family

Plantago purshii-----Pursh's Plantain

Polygalaceae--Milkwort Family

Polygala alba-----White Milkwort

Polygonaceae--Buckwheat Family

Persicaria lapathifolia-----Dock-leaved Persicaria
Persicaria persicaria-----Lady's Thumb
Polygonum neglectum-----Narrow-leaved Knotweed
Polygonum ramosissimum-----Bushy Knotweed
Rumex crispus-----Curled or Narrow Dock
Tiniaria scandens-----Climbing False Buckwheat

Portulacaceae--Purslane Family

Portulaca oleracea-----Purslane

Primulaceae--Primrose Family

Androsace occidentalis-----Primrose

Ranunculaceae--Crowfoot Family

Anemone decapetala-----Kansas Anemone
Delphinium virescens-----Prairie Larkspur
Myosurus minimus-----Mousetail

Rosaceae--Rose Family

Rosa pratincola-----Prairie Rose

Rubiaceae--Madder Family

Galium aparine-----Cleavers, Bedstraw
Galium concinnum-----Bedstraw
Houstonia angustifolia-----Narrow-leaved Houstonia

Salicaceae--Willow Family

Populus sargentii-----Cottonwood
Salix amygdaloides-----Peach-leaved Willow
Salix longifolia-----Sandbar Willow

Scrophulariaceae--Figwort Family

Mimulus geyeri-----Geyer's Yellow Monkeyflower
Pentstemon albidus-----White Flowered Beard-tongue

Solanaceae--Nightshade Family

Physalis heterophylla-----Clammy Ground Cherry
Physalis longifolia-----Long-leaved Ground Cherry
Solanum nigrum-----Deadly Nightshade
Solanum rostratum-----Buffalobur

Typhaceae--Cattail Family

Typha latifolia-----Broad-leaved Cattail

Ulmaceae--Elm Family

Ulmus americana-----American Elm
Celtis occidentalis-----Hackberry

Verbenaceae--Vervain Family

Lippia cuneifolia-----Wedge-leaved Fog Fruit
Verbena bipinnatifida-----Large-flowered Verbena
Verbena bracteosa-----Large-bracted Vervain

Verbena hastata-----Blue Vervain

Verbena stricta-----Hoary Vervain

Violaceae--Violet Family

Viola nuttallii-----Yellow Prairie Violet

Viola papilionacea-----Blue Violet

Viola rafinesquii-----Field Pansy

Vitaceae--Grape Family

Vitis vulpina-----Riverside Grape

Zannichelliaceae--Pondweed Family

Potamogeton natans-----Common Floating Pondweed

Potamogeton obtusifolius-----Blunt-leaved Pondweed

Zygophyllaceae--Caltrop Family

Tribulus terrestris-----Mexican Sandbur

3. New Species in County:

a. Cryptogams

Chalamydomones tingens

Cladophora glomerata

Closterium striolatum

Conferva bambycina

Conferva fontanalis

Draparnaldia plumosa

Encyonema ventricosa

Equisetum fluviatile

Equisetum laevigatum

Gleocapsa magna

Navicula gracilis

Navicula viridis

Nitzschia lanceolata

Oscillatoria anguina

Oscillatoria leptotricha

Oscillatoria major

Oscillatoria princeps

Pandorian morum

Pleurosigma intermedium

Spirogyra adnata

Spirogyra calospora

Spirogyra decimina

Spirogyra flavescens

Spirogyra mirabile

Spirogyra punctata

b. Phanerogams:

- Apium petroselinum
- Aristida purpurea
- Artemisia frigida
- Asclepias arenaria
- Aster salicifolius
- Chenopodium leptophyllum
- Cuscuta arvensis
- Cyperus inflexus
- Estonia obtusata
- Eragrostis curtipedicellata
- Eragrostis frankii
- Eragrostis major
- Galium concinnum
- Padus nana
- Salvia pitcheri
- Schizachyrium scoparium
- Silphium laciniatum
- Solidago lindheimeriana
- Spartina michauxiana
- Wolffia columbiana
- Xanthium commune

VI. Conclusion

The work has revealed that the study of the Tasco Lake region was certainly justified and the preliminary generalizations in regard to the area were very true. The survey has fulfilled the purpose stated in the forepart of the thesis in that it has made available additional knowledge in regard to Western Kansas plant life and has been a thorough study of a small area where xerophytic, mesophytic, and hydrophytic plants are abundant.

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The Comenius Press, 1887. 2v.

Volume one is text; volume two plates.

Authority on algae.

Weber, Clement. The flora of Sheridan County, Kansas.
(In Kansas Academy of Science. Transactions,
vol. 35. Manhattan, Kimball Printing Co., (1932),
pp. 161-178).

Very useful in determining previous work in
the county.

Personal Interview

Houseworth, Mrs. F. W. July 5, 1935.

Owner of tract of land under consideration.

Supplied history of area.