6-1895

Report of a Botanical Exploration of the Sand-hill Region of Central Nebraska made in the summer of 1893.

Per Axel Rydberg
University of Nebraska

Thesis

presented by

Per Axel Rydberg

for the degree of
Master of Arts

University of Nebraska, June 1896.

Report

of

Botanical Exploration of the Sand-hill Region

of

Central Nebraska

made in the summer of 1893

by

P. A. Rydberg
as Field Agent of the U. S. Dep. Ag.

(1)

Purpose and Field

May 23, 1893, I was appointed Field Agent of the Division of Botany of the U. S. Dep. of Agr. for the purpose of making a botanical collection and exploration in the Sand Hill Region of Nebraska. The supervision was partly left in the hands of Dr. Chas. E Bessey of the University of Nebraska. On his recommendation, Thomas and Hooker counties were selected as the principal field of exploration. The former of the two is about the center of the region and perhaps the most representative one of the central sandhills.

The sandhill region extends from 103° to 98° longitude. It is bounded on the southwest by the North Platte River and on the north by the Niobrara. The south eastern limit is a broken line from near the mouth of Niobrara to Dawson Co.

As my instructions from the Department were rather to confine myself to a smaller field and work it thoroughly than to travel over a larger area and not be able to do the work so well, I limited my field to those two counties and the third ~~[illegible]~~ Grant Co. On two occasions I crossed over into neighboring counties, only a few miles however; one into Cherry Co and one into Custer and McPherson Co's.

Itinerary.

My appointment was to take effect on the 10th of June 1893, but I was not ready to start before June 13. At 12:25 P. M. I left Lincoln by the Burlington & Missouri R.R.

in company with Mr. N. P. Tuley, a student of Augustana College, Rock Island, Ills. Mr. Tuley had asked for the privilege of accompanying me on my summer collecting tour for his own pleasure and benefit. He stayed with me until Aug 25, and to him many thanks are due for much help in the work and for a pleasant company.

At 1:36 P.M. we arrived at Thedford, county seat of Thomas County. This town was to serve as our base of operation. Here we remained till June 24th or until we had been able to secure a team for the summer. During the stay I met Mr C. C. Wright, one of the early settlers, who has several times sent in collections of grasses to the State Fair. From him I received much useful information as well as specimens of a few grasses and sedges which I did not collect myself. On

June 20, we collected around Natick, a flag station ~~21~~ 7 miles east of Tilford, and on the 22 and 23, around Norway, a station 8 miles west ~~of the former place~~ thereof. All these stations are situated in the Middle Loup Valley which the B. & M. R. R. follows from Dunning, Blaine Co. to ~~Post~~ 5 miles east of Mullen, Hooker Co. During the nine days of collecting, we secured a nearly complete representation of the flora of ~~the~~ the valleys as well as of the surrounding sandhills.

On June 24th that is as soon as we had secured a team, we drove across the sand hills to Dismal River 15 miles south of Thedford. Our outfit consisted of a small A tent, 7x7, 2 1/2 yds. oilcloth, 2 quilts, 2 satchels with clothing, 2 telescope valises with dryers and blank newspapers, 2 collecting cases, 6 presses (Mr. Tuller had 2 and I, 4), a box of provisions cooking utensils etc.

There was scarcely room for all in the spring wagon.

The presses I have found best for more extensive field work are made of heavy wire screen, supported by a stout frame of hardwood with two crossbars They are drawn together by means of strings, in a way (similar somewhat to that used ~~by~~ in the Acme Presses, sold by James Queen & Co. These presses have the advantage over board presses in this, that they give the air free access to the ferns, and thereby facilitates the drying, while at the same time the pressure may be regulated at pleasure.

Upon reaching Pisinal River, we drove a few miles down the stream, and pitched our camp on a ~~little~~ hillside some distance from the river to avoid the mosquitoes. We were not far enough, however, for they kept us awake the next two nights, and the horses suffered

perhaps more than we did. ~~On the~~ During the night between June 25 and 26, one of the horses broke loose. As soon as it became light we started out in search of it. On the road in the sandhills I saw the track made by the dragging picket rope. I followed it, but had to walk 15 miles before I found the animal. On my return we moved the camp nearly to the top of the hills and almost half a mile from the river. By banking up the sand around the base of the tent and pouring a few drops of Cedar Oil on the canvass at the entrance, we succeeded in keeping out of the tent the mosquitoes. Other "pests" that troubled us and the horses during our stay on Dismal River were: sandflies, deerflies, and woodticks.

Our camp remained here till the 30th of June; when we moved it 10 or 12 miles further up the stream to a place known as Plummer Ford. Here we stayed till July 20

As there were no stables in the neighborhood and the nearest store was at Thedford, we had to go there once a week to replenish our supplies and get our mail. The road was about 25 miles, over the sandhills. The time that I drove across, I had a good opportunity to observe the sandhills at this point. Count Plummer Ford was the best collecting we had during the summer.

July 10 we moved our camp to a place near the "Forks" of the Dismal River, collecting there until July 15. Then we crossed the sandhills at a new place, and, returning to the Middle Loup Valley, pitched our camp near the river, 1 1/2 miles north of Mullen, the county seat of Hooker Co.

On the 25th we broke camp and, as there was no road along the river, we drove to Mullen. Here we followed the Dry valley, in which the B. & M. R.R. runs, to Seidel, a flag station about 8 miles

west D Mullen. Here we turned north and struck the South Branch, or as it is called here South Prong, of Middle Fork, a few miles above the junction. Here we were a mile or two inside the Cherry county line. We remained only 2 days.

July 28 we broke up again and followed the South Prong. The river, which here was only a small brook, soon disappeared from the surface and was continued by a Draw draw running through a valley, the grass of which became better and better the further up we came. At the head of this draw we found a big valley, having at its eastern end a lake, at this time of the year only a small pool filled with Ranunculus aquatilis. Here we pitched our camp near Mr Tavis' Ranch, about 3 miles north east of Whitman.

Here we collected until Aug 2 when we drove south, passing through Whitman. Along the road we found no settlers, and

and in this region there are no springs. In the evening we came to a windmill, but saw no house. We learned the next day, that it was put up by a Mr. D. Egan, living 3 miles from the place, for his cattle. We concluded to stop here where we could get water. This ~~was~~ place is about 15 miles South of Whitman.

This night, and also following, we ~~had~~ had a heavy dew fall, the only time it happened during the summer, as far as I can remember. The thermometer was only 57° at 9 o'clock the next morning, when we started out on a collecting trip to a so called "wet valley" at the west end of which Mr. Egan lived.

On the morning (Aug 4) we moved camp again, following the post-road until about a mile south of Abby P. O. Here was a big wet valley, containing the ranches of four brothers by the name Harvey.

Aug 7 we pulled out for the headwaters of the South Fork of

of Dismal River, at noon we stopped near Swan Lake; collecting ~~collecting~~ there for a few hours. In the afternoon we continued our journey, but, taking a wrong road, we came much farther South than we wished, and arrived late in Dale in the evening at West Cody's Lake. Here Mr Cody, better known as Buffalo Bill, once had a range. The Cody's Lakes are the headwaters of South Dismal although the water runs in the sand for two or three miles before it comes to the surface. Around the lakes was a good collecting ground

Aug 11 we moved our camp further down the river to a place about 4 or 5 miles above the forks. While staying here one day, six were collecting down the river and passed near the most western house of a settlement of four families. I think ~~it~~ there are the only human habitations besides, at Mr. Crumbs horse ranch from near the head of South Dismal

to Dunning, where Desinal river empties into Middle Loup. Two women were working in the garden but ran into the house as soon as they saw us. Luckily we returned to our camp across the hills, for, as we learned from her husband in the evening, one of the women had been watching us from a hill near the house, with a spy glass in one hand and a rifle in the other. For 2 or 3 hours or till her husband came home. She had been determined to shoot had we come nearer. A brother-in-law of hers had been shot at the next neighbor's house two years before, and it was never ascertained who killed him. This may explain ~~her why she was so scared her unapproachable attitude.~~

Aug. 15 we crossed the sandhills again to Mullen, where we stayed till Aug 18. Then we drove down the Middle Loup valley to Sidport. Aug 21-25th we made a collecting trip to Plummers Ford in order to get the fall flora of Desinal River

Aug 26 Mr Tuler left for Rock Island Ills. My commission expired Sept 10, but as I had to leave the field for private matters from Aug 26 to Sept 6 I made up the time lost in staying till Sept 21, when I returned to Lincoln.

From Sept 7 – Sept 20, I confined my work to the region along the B, M. & C.R. collecting around Milford ~~from~~, Sept 7 – 10 and 12 – 13; Hatley and Natick, Sept 11; Mullen, Sept 14, 15, 18; Seneca, Sept 16; Whitman, Sept 19 – 20.

If the sandhill region ever was a lake formation, it has, however, received its present form by the action of the wind. In fact it is still in the process of formation. The sandhills change their form constantly. Wherever the sand is not held together by the roots of plants or ~~damp~~ moss or otherwise protected it is carried away by the wind and deposited somewhere else. Therefore if a spot on a dry hill becomes bare, the loose sand is blown away, a small hollow is made, the surrounding grass dies from draught, the dry sand, no longer held together by the roots, slides down into the hollow and in its turn is blown away. Thus the hollow becomes larger and larger. I have seen such "blowouts" 100 m. in diameter and 15 to 20 m. deep. It has happened that settlers have broken their land and in a few years found their field to consist of a big blowout. The sand carried away by the wind is

deposited in big drifts, ~~that~~ i.e. new sandhills are formed or old ones increased in hight. There would be no stability whatever were it not for certain plants that seem to thrive best just in these blow-outs. When once established their roots bind the sand together and their decaying parts enrich the soil. Thus they give protection to ~~protect the sand~~ and make ~~fit~~ the sandhills fit for other vegetation. Such blow-out plants are:

~~Calamovilfa longiflora, Eragrostis~~
Calamovilfa longiflora, Eragrostis tenuis, Redfieldia flexuosa, Muhlenbergia pungens.

Topography and Floral Districts

As can be seen from the map, the route of our travel closely resembled a large 8. The longer sides of this 8 followed the Middle Loup River and its tributary the Dismal; the ends and the cross at the middle ran across the sandhills. Besides we crossed the eastern half somewhat diagonally between Plummer Ford and Thedford

If the region should be divided at all into natural districts, these districts would number five, each traversed by a special part of the S.

1. Middle Loup Valley.
2. Dismal River Valley
3. Sandhills of Thomas Co., a Barren Sandhill Region.
4. Sandhills of Hooker Co., a Dry valley Sandhill Region.
5. Sandhills of Grant Co., a Wet valley Sandhill Region.

Middle Loup Valley.

The Middle Loup River is here a very fast running stream, but without any true waterfalls. The slope of the valley, deduced from the altitudes of the R. R. tracks at the stations, as published by the B. & M. R. R. is in Thomas Co., between Seneca and Halsey, on an average 8 1/3 feet to the mile or over 1 1/2 m. to the Km. In Hooker Co. it is still greater, perhaps, nearly 13 ft to the mile

or a little less than 2 1/2 mi. to the Km. Of course the fall of the river is much less, perhaps only 1/3 or 1/2 there, as the stream winds from one side of the valley to the other. In Thomas Co., the valley is from 1/2 to 1 1/2 mile wide, and consists of rich meadow land. The soil as a rule in the whole region is sandy. The sandhills rise 60 to 100 ft. or sometimes more above the valley. North of Mullen, Hooker Co, the valley is much narrower, the river still more winding, and the bottom filled with lagoons and swamps, remains of old river beds. The valley here makes is a good pasture land, but is mostly too rough and cut up for hay land. Still higher up, especially above the forks, the valley is still narrower and the hillsland has almost disappeared.

Dismal River Valley

Dismal River resembles the Middle Loup very much, but is a smaller stream. About 400 or 500 m above the junction of the two forks

of Dismal River each has a fall of 3½ or 4 m. in height. The bed over which the water falls is not of a rocky, but rather of a clayey formation. It is easily cut by the knife and crumbles into pieces when dryed, but is seemingly rather consistant when under water. The valley of the Dismal River is much narrower than that of Middle Loup, the river more winding and here and there makes deep cuts into (sometimes 100 m. deep) into the surrounding sandhills. The trail we followed up the valley at several places on account of the cuts mentioned above, ran over ridges 100 m. high, or followed dry valleys running parallel to the river. We had to ford the river three times in 10 miles, once at a place where the water went several inches into the wagon box. The lower part of the Dismal River, i.e. for instance South of Thedford, is swampy and resembles Middle Loup at Mullen. Digging up

the ones, especially on the south side, become much higher than around Middle Loup. at Thomas Ford they are about 150 m. Between Mr. Crumb's horse ranch and the forks, the valley becomes a deep cañon, perhaps 200 m. deep, the road running on the hillside about 100 m above the river. At the forks and along the South Dismal the sand hills on the south side are at some distance from the river, leaving a dry sandy prairie of a couple miles width.

The Barren Sandhills.

These sandhills are not barren in the sense that they are without vegetation, but I have used that term for want of a better expression. They are barren in this respect, that they are now of very little use to man. Most of the hills between Thedford and Dismal River are of this kind. Save near the Middle Loup valley where the hills are less sandy and intermixed with small dry valleys, the country here is made up of sandhills after sandhill with scarcely any grassy

valleys between. This region contains nothing but the true sandhill ~~re~~ regulation. Seen from one of the high points, the hills appear like the billows of the ocean. In the eastern part of Thomas county as well as north of Middle Loup, the country assumes more and more the nature of the next region.

The Dry Valley Sand Hill Region

This region consists of sandhills, mostly running east and west, intermixed with long continuous valleys with more or less perfect underground drainage. These valleys are sometimes 1/2 Km. or more wide. The soil is as a rule a sandy loam. Many of them are under cultivation, and if there is a sufficiency of rain they yield good crops. Others are used as pastures, and in wet seasons can be used as hay-lands. The larger part of Hooker Co. is of this nature.

The Wet Valley Sand Hill Region

The rows of the sandhills are here more irregular, but the general

trending across - here east and west. The hills are generally very high and steep, and it is hard, sometimes nearly impossible, to cross from one valley to another, if driving north and south. East and west the valleys are somewhat connected, but the drainage from one to the other is imperfect or wholly wanting. In shape the valleys are more or less elongated triangular, with the apex toward the west and the narrow base toward the east in one or the other, or sometimes in both, of the eastern corners there is a smaller or larger pond or slough, invariably called a lake. Sometimes the two lakes are connected, forming a single one occupying the whole of the eastern end. I noticed, that in most cases the highest hill was north of the lake, the next highest east, and the lowest, south. Each of the corners of the valleys was often connected east and west with adjacent valleys by a depression in the hills, the western end with some valley above, the two eastern with some valleys below. The accompanying sketch shows, schematically, the form

of the wet valleys northeast of Whitman. These valleys are excellent hay meadows. In the summer the sloughs or lakes often dry out, and the amount of water varies much according to the season. Some year it may be a good haymeadow when the year before was a lake, or a dry valley. From Pound and Smith's Report in the Pub. of the Bot. Survey of Neb. No II I find that regions like these two were met with in Cherry County.

Altitude, Temperature, Rainfall etc.

The altitude of the region is from about 600 m. to over 1200 m. The railroad tracks at Halsey are 2695 ft. or 821.[illegible] m. above the sea level, those at Whitman 3588 ft or 1095.6 m. The hills rise much more than 100 m. above the valley, in which the railroad runs, which will make the highest over 1900 m.

There have been local weather ~~reports~~ stations at Thedford and Whitman for 4 years. The reports for 1890 - 1892 are very incomplete and the report for 1893 is not yet published. I have therefore not been able to get the exact data concerning temperature and rainfall, According to the excellent Meteorological Charts, prepared by Prof. Goodwin D. Swezey of Doane College, Crete, Neb., and published in the Report of the Neb. State Board of Agr. 1892, the average rainfall in this part of Neb. is during Jan, Feb and March less than an inch per month; during

April, 1-2 inches; during May, June, and July, 3-4 inches; during August, 1-2 inches, and during September, October, November and December less than one inch. The average rainfall for the growing season (~~August~~ April – August), is 14-16 inches and the average total for year is about 20 inches. This seems to speak very favorably for the region, but, but another fact must also be taken into consideration, viz. that the region is filled with sandhills with scant vegetation. These sand-hills become intensely heated by the sun, and the ~~hot~~ winds from the hills scorch the grain-fields. Most days from July 4th to Aug 24 the thermometer shows at noon about 90° F or more in the shade, at times even as much 100° F. The highest recorded was 112° F. The highest recorded at Tucumcari was 112° F in 1890 and 113° F. in 1892. The mean temperature ~~there~~ for those two years was 78.4° and 80.2° F. for June, 82° and 81° F. for July.

The prevailing wind ~~from~~ South-East. during the summer was from the S.E. From Prof Swezey's Report, it appears to have been so during the year 1892 also. The

most rain came from N.W. the clouds going against the wind. In most cases, however, the wind changed during the heaviest shower, both wind and cloud then coming from ~~the~~ N.W. From June 13 to Aug. 10 we had at least one rainy day each week, but after that time the showers were few. In the night between any 2d and 3d. a heavy dew fell. So also the next night but less in quantity. This was the only time I noticed any dew fall during my stay.

Flora

I have described 5 floral ~~districts~~ regions of which the ~~two~~ first, the Puddle Loop and the Dismal River are really branches of one and the same. The vegetation is nearly the same, and also similar to that of the Mt Valley Region with its addition of some eastern plants, that have ascended the river valleys. The plants of these three regions may be divided into four classes.

1. Sand hill Plants
2. Dry Valley or Hillside Plants.
3. Wet Valley Plants
4. Aquatic Plants.

In the fourth floral region, the Dry Valley Region, the last two classes are lacking, and in the third, the Barren Sandhill Region, as I have called it, plants of the first class only are found.

Sandhill Vegitation

The most characteristic plants of the Sandhills are of course the four blow-out grasses mentioned above: Calamovilfa longifolia, Eragrostis tenuis Redfieldia flexuosa Muhlenbergia cuspens. of which the two latter are found also on nearly every sandhill. Next to these are the following the most common or the most characteristic.

Herbs.

Andropogon scoparius,
Andropogon Hallii
Stipa spartea
Stipa comata,
Aceratis viridiflora
Aceras angustifolia
Aceras lanuginosa.
Astragalus ceramicus
longifolius

Psoralea lanceolata, Commelyna virginica
Psoralea digitata, Tradescantia virginica
Cnicus pitcheri, Yucca glauca
Opuntia Rafinesquii, Acnida tamariscina
Euphorbia petaloidea, Froelichia floridana
Euphorbia Geyeri, Cyperus Schweinitzii
Chrysopsis villosa Laciniaria squarrosa
(intermedia
Aristatella Jamesii Cyclolomia atriplicifolia.
Doriospermum Hyssopifolium, Argemone
platyceras
Croton texensis

Under Shrubs.

Prunus pumila, Amorpha canescens
Panothus ovatus, Canistera villosa

I have not tried to enumerate all plants growing on the sandhills. Hints should be understood that those mentioned are confined to the sandhills alone. Many run down into the dry valleys as for instance the Stipae, Acnida and Argemone; some even to the river banks as Tradescantia. As I have

said before, and as may be seen from the list the sandhills are far from ~~lacking~~ destitute of vegetation. The plants however, never grow close together, but generally 2-5 dm. apart, so that the sand is always seen. In many places a few centimeters below the surface which is perfectly white, the sand is mixed with finely decayed or rather poorly cured and half burnt vegetable matter, resembling black tea. If it is a product of the prairie fire or of the sun heated sand I can not tell.

Dry Valley Vegetation.

This is in fact identical with the general prairie flora of the state with the addition of some sandhill species, which run down from the hills. The most characteristic are of course the prairie grasses, some of which are enumerated below under the heading, Native Forage Plants. Other common plants are:

Sisyrinchium angustifolium
Lesquerella Lambertii
Psoralea argophylla
Allium Fittalii

nothera serrulata — Monarda citriodora
rbena stricta — Verbena hastata
tentilla argata — Artemisia Canadensis.
mbrosia psilostachya — Artemisia ludovigiana

Wet Valley Vegetation

The wet valley flora is of course the richest as far as species are concerned. To this region most of the hay grasses of the region. Other common plants of the meadows are:

isetum laevigatum — Stellaria longipolia
lium trifidum — Campanula aparinoides
lium triflorum — Lythrum alatum
lium aparine — Potentilla norvegica.

Among the bushes the following were common:

Habenaria hyperborea — Geum strictum
Vaginera stellata — Thalictrum purpurascens
lygonatum canaliculatum — Geum canadense album
Circaea lutetiana — Scutellaria galericulata

Aquatic Flora

Most of the aquatic plants are very local, each lake or pond having its peculiar plants. Those common throughout the region are:

Lemna minor — Utricularia vulgaris

Lemna trisulca
Sagittaria latifolia
Potamogeton pectinatus.
Ranunculus aquatilis trichophyllus

The following are found in both rivers!

Lemna polyrhiza
Typha latifolia
Sparganium Eurycarpum.
Potamogeton lonchites
Potamogeton pusillus.
Betula angustifolia

Weeds.

Several eastern weeds have come in here, but also many of the native plants act as if they were likely to become more or less troublesome weeds. The worst weeds introduced is the Russian Thistle. Salsola kali tragus, but It has not established itself yet in this region. I found it along the railroad at Mullen and more common at Thedford. I also collected a few specimens near Plummers Ford, 15 miles from railroad. Other weeds or plants likely to become such are:

Helianthus annuus
Helianthus petiolaris
Chenopodium albicum
Chenopodium leptophyllum
Chenopodium hybridum
Chamaesaphis viridis
Cenchrus tribuloides
Panicum capillare
Amaranthus albus.
Amaranthus blitoides

Acnida tamariscina
Portulacca oleracea
Rumex venosus
Cycloloma atriplicifolia
Eragrostis major
Eragrostis caroliniana
Xanthium canadense
Amaranthus retroflexus
Lappula redowskii
Lappula deflexa
Erigeron canadense
Lepidium incisum
Ambrosia ~~tom~~ xanthifolia
Ambrosia artemisiaefolia

-There are three plants that I have scarcely seen anywhere else, ~~except~~ than in the "prairie-dog-towns" here as well as in Western Nebraska. viz.:
Solanum triflorum, Cryptanthe crassisepala, Chenopodium Fremontii incanum

Native Trees and Shrubs.

The most common woody plant is *Amorpha canescens*, which is common all over the sandhills. Next comes the Western sand cherry, a broad leaved variety of *Prunus pumila*. On the Sandhills around Thedford the third in order is *Ceanothus ovatus*. If *Rhus aristata villosa* is to be classed among the undershrubs, which it may be should be, it is as common as any. All these belong to the true sandhill flora. Nearly all the other woody plants are confined to the Middle Loup and Dismal River Valleys. A few as for instance *Salix longipolia*, *Symphoricarpos occidentalis*, *Prunus americana*, *Amorpha fruticosa*, are also found in some of the river valleys.

Amorpha fruticosa and *Salix longipolia* line the rivers for long distances and are the most common woody plants of the lowlands. A complete list of the *Salices*, *Cornus stolonifera*

Ribes floridum, an upright form of Rhus radicans Rosa - - - - - , Prunus americana are also common on or near the river banks.

On the hillsides and in the dryer parts of the valleys the most common woody plants are, Prunus demissa and Symphoricarpos occidentalis, Acer Negundo, Rosa virginiana arkansana, Ribes aureum, and Rhus canadensis trilobata were also found here and there on the hillsides. So also Fraxinus pennsylvanica and its variety lanceolata with several intermediate forms. None of the latter were of a great size, and most of them only stunted shrubs. At Norway, Mullen, and on the South Prong of Middle Loup, I found some Cottonwood, Populus monilifera. This tree was also found on the Dismal River. Celtis occidentalis was found on both rivers but was not very common. Near the forks of the Dismal and I found some trees between 4 & 5 dm.

in diameter. Juniperus virginiana was found along the Dismal River and ~~seemed to~~, judging from the stumps and brush left, it must have been a very common tree and of considerable size. What now remains consists mostly of young trees. Parthenocissus quinquefolia and Vitis riparia were occasionally met with on the river banks. More local were: Celastrus scandens and Rubus occidentalis, found near Plummer Ford; Ribes gracile, near Crumb's horse ranch; Crataegus coccinea, near the Forks of Dismal River; Ulmus americana, on the south Dismal about 4 miles above the forks, and Rhus glauca, three miles below our first camp on Dismal River.

Native Forage Plants.

The principal haylands in the region are the wet valleys and that part of the Middle Loup bottom land which can be mowed. The meadow land along Dismal River and the upper part of Middle Loup is too narrow and is cut up by the river to be harvested, and must be used as pasture land. Grant county, which ~~~~ consists mostly of sandhills and wet valleys, is a fair stock raising country. The wet valleys are used chiefly as haylands, when the dry valleys, the hillsides, and even the sandhills are used as pastures. The haymeadows are made up principally of the following grasses, arranged according to their relative value, depending partly on the quantity in which they grow and partly upon the quality of the hay. Those to the left are regarded as the best:-

Andropogon provincialis, Agrostis alba, Panicum virgatum, Panicularia nervata

Agropyrum glaucum accidentale, Panicularia americana
Andropogon nutans Spartina Cynosuroides
Muhlenbergia racemosa, Beckmannia Eruciaeformis
Phalaris arundinacea, Carex trichocarpa ar-
istata
Agropyrum sp., Scirpus triangularis.
Calamagrostis Canadensis, Disticlis spicata stricta
Elymus Canadensis. Eliocharis palustris.

The meadows along Middle Loup contain all enumerated with the exception of Beckmannia, Phalaris, and Disticlis and in addition there is: Calamagrostis robusta, Carex stipilata Muhlenbergia Mexicana, Carex filiformis. Panicum scoparium, Carex Nebraskensis Panicum dichotomum, Carex aurea. Sporobulus asperifolius Carex echinata radiata Agrostis hiemalis Equisetum laevigatum the last one claimed to be a valuable "hay grass."

The bottom land of Dismal River, as has been said before can not be used for hayland, as it is too rough to mow. It is instead used for summer ranches. The meadow consists of about the same forage plants as the Middle Loup

Valley with two additions.
Alopecurus geniculatus aristulatus
Agrostis sp

The prairie plants of the dry valleys, hillsides, and knolls of the sandhills, consists mostly of the following species of which some are of little value.

Boutelova oligostachya, Panicum virgatum
Boutelova hirsuta Agropyrum occidentale glaucum
Bulbilis dactyloides, Stipa spartea
Catonia obtusata Stipa comata
Koeleria cristata Elymus canadensis
Andropogon scoparius Andropogon Hallii
Boutelova curtipendula Paspalum setaceum
Eglingia purpurea Sporobulus cryptandrus

The first 5 to the right are regarded as the best pasture grasses, while the first 6 to the right are often cut for hay, when they grow in quantity.

On the prairies of the Middle Loup valley a valuable addition to the pasture is made by the following which grow in some places in quantity:

Poa arida
Poa arida var.
Poa purpurascens
Poa pratensis
Carex filifolia

From the foregoing can be seen that

Stock Raising

is and probably always will be the principal industry of the region. Before the Burlington & Missouri River R.R. (B. & M. R. R. R.) was built, the sandhills were overrun by the herds of the cattle ranches, but after the railroad came in, the good land began to become settled, the herd-laws were enforced, and the cattle kings had to move their herds further west. It was nearly impossible to keep the herds from the fields of the settlers. The herds were also in many places cut off from water. In Grant Co., where there is plenty of natural meadows, the settlers have turned stockmen, but on a smaller scale. The wet valleys are used as hayland, the dryer part of the valleys and the sandhills are used as summer pastures. Winter pasturing can scarcely be resorted to at all, as those plants are comparatively rare, that in western Neb. constitute the winter pasturage, viz. Boutelova oligostachya and hirsuta, Bulbilis dactyloides and Carex filifolia. In Thomas & and Hooker Counties, where the natural hayland area is very limited,

the settlers had to resort to farming also. As a rule this has not been very successful, and the homesteaders of those counties are generally not wealthy. Many therefore wish that the cattle-kings who always had money, were back. In order to bring money back again into the counties, meetings have been called for the purpose of petitioning Congress to pass bills authorizing the sale of the sandhills at the price of 15 cents an acre. Few of the settlers are able to pay even 15 cents per acre for the Government land that they are now using and need as pasture for their stock. Practically the land would be sold in township lots or as to stockmen. As I have said before the sandhills can not be used for winter pasturage. Hay is therefore needed for the winter. All the hay-lands are in the hand of the settlers. The stockmen would be obliged either to ship in hay, or drive away their cattle in the fall, or, which would be easier, to buy out or perhaps force out the settlers. This latter would not be very hard, as the settlers would be

- Their summer pastures.

Agriculture.

A part of the Middle Loup Valley in Thomas Co., some of the dry valleys in Hooker and the northern part of Thomas Co are used for agricultural purposes. Garden vegetables seem to thrive well. On July 11 we had new potatoes large as gooseeggs. I saw fine cabbage, tomatoes, onions, water-mellons, cucumbers etc. At one place I saw an experiment with Cicer (Medicago sativa). It did not give good results, ~~a great failure~~ mostly, I think, on account of ignorance of how to grow it. Fine specimens of Russian Millet, Panicum

millaceum), were brought into the store by a settler who had a field of, may be, 300 acres. On June 2 I saw a pure field of common millet (Chamaerachis... italics). The grain most planted was corn. I saw also fields of oats and barley. The country seems, however, not to be a very agricultural district. Some days we saw very fine cumulus, but when we returned to the same place in August, it was overcast and the sky would be bright. I hear that during preceding years, some rain has been obtained, but as a rule, I do not think that farming is a paying business. Some claim that there is too little rainfall. From my experience this summer and from the reports, I come to the conclusion that the annual rainfall is sufficient, but, that there is a season of drought in August with hot winds which scorch the leaves of the grainfields. ~~So the wind in the summertime~~ is the wind in the summer is generally from the south or southeast

the general belief is that the hot winds come from Kansas or even from Texas; as a rule, however, I think they are of a much nearer origin. It will not take a long time for a great distance for the wind, blowing over the highly heated sand-hills to become intensely hot. For my part I believe that the hot winds that scorch the cornfields are generated in the very sandhill region. The only remedy would be to cover the hills with a dense vegetation which could shade the ground. There is no grass, no forming grass that will grow here, nor do I know of any deep-rooted perennial herb that would thrive enough to cover the ground. Only the woody flora remains to be referred to; and this presents itself the question:

Reforesting the Sandhills

I say reforesting, as many and among them Dr. Elias H. Beasley think that the sandhills at one time were profusely covered with woods. Pine-logs have at a few places been found buried in the sand. There is a cañon in Custer Co., still containing

living pines. It is hard to explain how pine seed could have been carried from the Pine Ridge in Dawes and Sheridan counties to Custer and more so down in the intermediate counties. It would be still more strange if the seed had come from Long Pine on the Niobrara, about 75 miles north of said cañon, as they then would have had to cross, may be, one hundred ridges of sand-hills. Very likely in former days the pines grew, ~~the pines grew~~, if not all over the hills, at least in many intermediate places. The red cedar is not uncommon on the hillsides along Dismal River, but I myself found stumps and fragments of this tree at several places on the sandhills, where there was no vestige of living trees.

Without doubt, trees will grow in the sandhills, if the proper kinds and the proper treatment are used. Trial, ~~trial~~ is the test only. Repeated trials can determine, but these trials must not be made haphazard. There are many facts that must be had by a thinking mind on the way to select the right kind and the right

method, or rather to avoid a bad choice. The nature of the region as well as the nature of the trees to be selected must be taken into consideration. A tree that can be thought of must fill the following conditions.

1. It must be able to withstand the hot, dry winds in the summer and the cold dry winds in the winter. It must be a tree in which the evaporation is small The conifers, with their small leafsurface would suggest themselves, as being the most fit to meet the requirement.

2. It must be a tree with a deep rootsystem, which would reach to the permanent moisture. The Bull Pine or Rocky Mountain Yellow Pine, Pinus ponderosa scopulorum, is little grown by nursery men, because its deep root makes it hard to transplant, but this very fact makes it a desirable tree in the sandhill region. A very deep rootsystem is not, however, as necessary as it may seem as most of the sandhills are not as destitute of moisture as is generally believed. In many places the sand keeps moist a few inches below

the ~~previous~~ year Plummer Ford collected Penstemon Haydenii on one of the highest sand hills, the top of which had recently been formed by sand blown from one of the blowouts. To my surprise I found the roots of the plant surrounded by wet sand. Thus are hills, however, in which I would advise no one to attempt to grow wood, viz. those that contain blowouts or are likely to ~~suffer from~~ become such. Such hills as a rule are characterized by the blowout grasses, but hills in which the Stipas, Bouteloua hirta, and Panicum virgatum grow may often well be used for transplanting.

3. It must be a tree native to poor sandy soil. The Black Jack or Northern Scrub Pine, Pinus Banksiana Lambert growing on the sand barrens of Wisconsin and Upper Michigan, I think would be a suitable tree. I should think that the Scotch Pine, Pinus sylvestris, would also be one. I know a large region in Sweden, just as sandy. ~~Nearly~~ Almost the only vegetation there, when I saw it some 20 years ago, was heath, Calluna vulgaris. The Swedish government undertook

to plant forestpines there in, especially Pinus sylvestris. From the papers I find that the whole region now is a fine young pine forest. From the experiments made by Messrs E. G. and Hudson Brumm under the direction of the (in Holt County) Forestry Division of U S Dep of Agricult., Pinus Sylvestris, however, does not seem to be of much value. Perhaps the partial failure depended upon the fact, that the seedlings were received in poor condition or perhaps this pine, being a northern tree, can not stand the hot winds. If this were the case, however, Pinus Banksiana ought to be similarly affected, But this tree seems, from the experiments referred to, to be the very best tree for the region.

Many have taken tree claims in this region, but most have failed to make trees grow, yes statements have been made even publicly that it is impossible. I believe on the contrary. Most have failed, just because they have tried to fulfill the requirements of the treeplanting law. This was made to fit the conditions in a prairie region with a hard soil, not in the sand hills.

A thorough cultivation of the ground, although highly recommended and repeatedly urged, is the worst thing for a tree plantation in the sand hills. This has been plainly shown by the experiments made in Holt county. One of four lots planted with trees, was cultivated and at the end of the first year only 5% of the trees were living. On the other lots not cultivated the result was good. After two years the average on the three was 61% living. A thorough cultivation of a field in the sandhills means to make it a blow out or at least to dry up the ground. Besides cultivation then would prepare the ground for weed instead of killing them. The less the ground is disturbed the better.

The best tree for planting, I believe is Pinus Scotinoa "scopulorum". Perhaps it would be best to plant it mixed with Pinus Banksiana or other conifers or even such deciduous trees, as may be grown. I own a tree claim on one of the hills 2 or 3 miles north of Middle Loup and 5 or 6 miles from Mullen. The trees

planted there were: Box elder, Green Ash, and Cottonwood. All had a good growth and so far as I could judge 60% or 70% were alive. The seeds of the Rocky Mountain Yellow Pine, maybe, could be planted directly in the sand hills. Judge J. C. Polivar of Ainsworth Neb. I gathered a few bushels of Pine cones in the first part of Sept. 1893 and placed them in the sun to dry open a few days. The cones opened. He immediately planted the seeds on the sand hills of his tree claim. In a few days the young Pines came up, and, it is said, have grown to a height of 6 to 8 inches. Before the frost set in. The rapid germination of the seed has been tested in the green house of the University of Nebraska. The method of Judge Polivar, if successful, as it promises to be, will be the least expensive. It may be that the young trees will need some protection against the sun and hot winds the first two years. But when two years old the roots have reached the permanent moisture, and no care need to be taken of them except keeping the grass cut away. I have thought of finding some

tree or shrub that would give them the necessary protection the first two years. The Box elder is an excellent one, but is not easier to grow than the Pine itself. The native shrubs of the sandhills are mostly too low. Prunus demissa, which generally trails in the sand can not be used. Quercus ovatus is most too bushy. Amorpha canescens and Canistera villosa have a good amount of foliage and would give some shade for a year or two. Better than these would be, Pinus Banksiana, if it is as adapted to the region as reports seem to indicate.

If forest trees are planted to produce forest conditions, they must be planted in large ~~quantities~~ tracts. The groves on the tree claims do little or nothing towards ~~the~~ changing the conditions of the region. Extensive planting could be done only by the general government or by the state or at least under their control; perhaps best on the coöperative plan like the one proposed by Mr. Fernow, Chief of the Forestry Division of U.S. Dep. Agr. This planting should of course be undertaken, only in

lands useless for agricultural purposes
In this region of my summer collection
was a tract of land just of this
kind. The distance between Middle Loup
and Dismal River in Thomas Co is a-
bout 15 miles. The land consists mostly
of sandhills with scarcely any
grassy vallies between. The hills along
the rivers can be used as summer
pasture for a width of 4 or 5 miles
The cattle seldom go further, indeed as a
rule scarcely that far from water.
A belt, the width of which is about 6 miles is
then left of no use whatever. Even
the hills near the rivers are of so little
value in grazing that the land would
increase many fold in value, if covered
with woods.

Clematis ligusticifolia Nutt. in Torr. & Gray, Fl. N. A. 1: 9. (1838).

Rare: on a hillside near Plummer Ford, Dismal River, Aug. 22-24. (No. 1717).

Anemone cylindrica A. Gray, Ann. N. Y. Lyc. 3: 221 (1836).

Bank of Dismal River, south of Thedford, June 27 (No. 1431).

Thalictrum purpurascens L. Sp. Pl. 546 (1753).

A tall puberulent form with thick leaves, which are paler beneath, was very common among the bushes along the streams. On Middle Loup River at Natick, June 20, and Norway, June 22, 23; on Dismal River, south of Thedford, June 27; at Plummer Ford, July 3; South Dismal, Aug 14 (in fruit) (No 1413).

Cystorrhynchus cymbalaria (Pursh) Britton
Mem. Torr. Bot. Club ; *Ranunculus
cymbalaria* Pursh Fl. Am. Sept 392 (1814).

Batrachium divaricatus (Schrank) Wimm. Fl. Schles. 10 (1841); Ranunculus divaricatus Schrank B. aier. Fl. 2: 104 (1789).

It seems to be nearest this species, but differs from the European f[illegible] in having more flaccid leaves with lo[illegible]r and finer divisions. In the latter, the [illegible]bes are short and rigidly spreading in a [illegible]cle around the stem. The Nebraska specimens, viz my No. 4. from Lodge Pole Creek and those of the present collection, have the very fine divisions more or less ascending. The sessile leaves and the much longer peduncle s distinguish it from forms of R. aquatilis L. It was collected in Middle Loup River, near Thedford, June 16, and in Dismal River near Plummer Ford, July 3 (No. 1335). It was also seen in the Lakes of Grant County.

Ranunculus Cymbalaria Pursh Fl. Am. Sept. 397 (1814).

The oldest name for this seems to be R. salsuginosus Pallas Reise d. verosh. Prov. Russ. Reichs 2: 713 (1776). According to Ledebour (Flora Ross I: 33, 34), R. salsuginosus Pallas, l.c., and R. salsuginosus Dc. (Syst 1: 251 and Prod 1: 33) are not

the same. according to the same author, the former ~~should be is the same~~ is R. Cymbalaria Pursh, and the latter R. plantaginifolius Murr. and R. ruthenicus Jacq., a similar, but larger plant. Pallas in his "Reise" (i.e. ~~Part III p 243~~) does not describe give furnish a description to the name R. saleginosus, but bases this on an already described and figured plant, giving as synonym: "Ranunculus repens flore in caule singulis, fol. varie sectis. Ammann ruth. n. 107 tab. 13. fg 2." As I have no access to Ammann's Stirpium rariorum in Imperio Rutheno sponte provenientium Icones et Descriptiones, I can not tell if this is our R. Cymbalaria or not. ~~but~~ I am, however, strongly inclined to believe that Ledebour is right, as he cites the synonym given above, while DC Candolle and all American authors, so far as I know, do not use it as a reference to R. saleginosus, but DC Candolle gives it as a synonym of R. Cymbalaria in ~~his~~ systema.

Common on moist, sandy soil: near Thedford, June 15, 16 and Whitman Aug 1. (No 1334.

* Ranunculus ~~acceleratus~~ acceleratus Lin. Sp. Pl. ~~776~~ 554 (1753)

Banks of Middle Loup: Thedford June 16,

Mullen, July 18: Dry Lakes, west of Whitman, Sept 19 (No 1333).

Ranunculus pensylvanicus L. f. Suppl. 272 (1781); R. canadensis Jacq. Misc II 342 (1781).

Very variable, sometimes with many sessile leaflets. Specimens fully 1½ m. were found on the Middle Loup, near Mullen, July 17. also collected at the forks of the river, July 26, and near Cody's Lakes Aug 9. (No 1559).

Ranunculus sp.

A low and apparently subcespitose plant, rooting in the mud I found no specimen in bloom. The texture of the leaves resembles somewhat that of the leaves of R. Nuttallii Back & Tragg, especially those of the var. repens (R. multifidus repens Wats Kings Rep. 8 (1871); but they are larger, ternately divided, the divisions cleft into 2-lobed parts.

Common in the dry Lakes of Grant Co. Sept 19 (1789).

Delphinium carolinianum Walt., Fl. Car. 155 (1788). var

A low, leafy form peculiar to the sand-hills and dry plains of Western Nebraska. The plant is glandular as well as pubescent, especially so on the peduncle. It is the same form as ~~my~~ No of my Western Nebraska collection. Thedford, June 19; Norway, June 22; Plummer Ford, July 8. (No 1360).

Argemone mexicana albiflora (Hornem) D.C. Syst. Nat. 2: 286 (1821); *Argemone albiflora* Hornem. Hort Hafn. 489( ).

This is the common Argemone of Western Nebraska and has generally been named *Argemone platyceras* Link & Otto. Icones 43( ). I have not seen the original description, ~~therefore~~ but if *A. hispida* Gray is a synonym thereof, our plant is not *A. platyceras*. *A hispida* Gray is hispid as well as densely prickly. Our plant is only sparingly prickly on the stem. Prof. Godwin Sweezey of Doane College, Crete, has suggested, that it must be *A. mexi*

cana albiflora, although the leaves have no whitish blotches. It agrees well with the figure and description of A. albiflora in Curtiss, Bot. ~~Mag.~~ Mag. t. 2342. – Thedford, June 19; Dismal River, June 29; Mullen, July 19. (No 1358).

Nymphaea adversa Solander, in Ait. Hort. Kew. ( ).

Collected only at one locality: Swan Lake, Grant County, Aug 7. (No 1650).

Rorippa palustris (L.) ~~Greene, Man. Bay~~ Reg. Bot. 21 (1894);

Rorippa palustris hispida (Desv.); Brachylobus hispidus Desv. Journ. Bot. 2: 183 (1809)

In the Lake Region of Grant County, but rare. Dry Lake, 3 miles north-east of Whitman, July 31, and north-west of the same place, September 19. (No. 1787).

Rorippa obtusa (Nutt.); Nasturtium obtusum Nutt. in Torr. & Gray, Fl. N. A. 1: 77 (1838)

Lake Region; north east of Whitman, July 29; 15 miles south thereof, Aug 3; and 2 miles West thereof, Sept 19. (No. 1626).

Cardamine hirsuta Lin. Sp. Pl. 655 (1753) var. ?

Only 3 small specimens were collected in springs near Plummer Ford, Aug 3. On account of the scanty material, I can not determine to which species it belongs. I places it for the present under C. hirsuta, although it differs from the European form of that species, in being perfectly smoth. My specimens are all small, only 1 dm. or less, rooting in the mud, and with rounded leaflets, sinuately 3 lobed at the apex. (No. 1720.). New to Nebraska

Arabis glabra (L) Weimman Cat Dorp. 18 (1810).; Turritis glabra Lin. Sp. Pl. 666 (1753).; Arabis perfoliata Lam Ency. Meth 1: 219 (1783).

Rare, Plummer Ford, July 6 (No 1508).

Arabis hirsuta (L.) Scop. Fl. Carn. Ed 2. 30 (1772), ≠ Turritis hirsuta Lin. Sp. Pl. 666. (1753).

Only one specimen collected, Norway, June 22. (1405).

Draba caroliniana micrantha (Nutt.) Gray Man. ≠Ed 5, 72 (1867); Draba micrantha Nutt. in Torr & Gray, Fl. N. A. 1: 109 (1838).

Rare. Thedford, June 15. (No. 1837).

Erysimum cheiranthoides Lin. Sp. Pl. 661. (1753).

Not common: Plummer Ford, July 3; Forks of Dismal River, July 11. (No. 1454).

Lesquerella argentea (Pursh) McMill. Meth. Minn. Valley, 203 (1892); Myagrum argenteum Pursh Fl. am. Sept. 434 (1814).

Rail Road bank, Thedford, June 14, 17. (No. 1281).

Lepidium incisum Roth. Nov. Cat. I. 224 (1797-1806), not L. incisum M. v. Reibst. Fl.

F & L. 2:98 (1808).

According to Otto Kuntze (Rev. Pl. Iconographicae) this is an older name for L intermedium Gray, Pl. Wright. 2:15 (1852). Thedford, June 15; Plummer Ford, July 4. (No. 1304).

Raphanus sativus Lin. Sp. Pl. 669 (1753). Escaped; near Thedford, Aug 26. (No. 1729).

Cleome serrulata Pursh Fl. Am. Sept. 441 (1814).

Only along the railroad banks, east of Mullen, July 20 (No. 1587).

Cristatella Jamesii Torr & Gray, Fl. N. A. 1:124 (1838).

In the sandhills: ~~East~~ south of East Cody's Lake, Aug. 9; Thedford, Aug. 26; Nuttick, Sept. 11 (No. 1664).

Viola palmata obliqua (Hill) Hitchcock Trans. St. Louis acad. Sc. v 5: Fl. Ames 1: 487 (1891); Viola obliqua Hill. Hort. Kew 316 (1768).

Only the plant collected. Bank of Middle

Loup River, Thedford, June 16 (No. 1336).

Silene antirrhina Linn. Sp. Pl. 419 (1753).
Thedford, June 17; Dismal River, June 29. (No 1349).

Lychnis Drummondii (Hook) S. Wats. Kings Rep. 5: 37 (1871); Silene Drummondii Hook Fl. Bor.-Am. 1: 89 (1833).
Hillside near Plummer Ford, July 3. (No 1471).

Alsine longifolia (Muhl)
Stellaria longifolia Muhl. in Willd Enum 479 (1809).
Spergulastrum gramineum Michx Fl. Bor. Am. 1: 276 (1803) is the oldest name, but Alsine Stellaria graminea is not available, as it is used for a European species. Wet meadow, very common: Thedford, June 15, 16; Plummer Ford, July 3. (No 1295).

Mollugo verticillata Linn. Sp. Pl. 89 (1753).
On the railroad bank, west of Mullen, Sept. 10 (No. 1773).

✓ Portulacca oleracea Lin. Sp. Pl. 445 (1753).
This is a common weed in Eastern Nebraska, but here growing sparingly in cultivated fields. Forks of Dismal River, July 11,; Mullen, July 17 (No. 1566).

Talinum teretifolium Pursh Fl. Am. Sept. 365. (1814).
My specimens are small with flowers scarcely larger than those of T. parviflorum Sandhills, Thedford, Sept. 8 (No. 1732).

✓ Hypericum canadense L. Sp. Pl. 785 (1753).
Cody's Lakes, Aug 9; South Dismal River, Aug 11 (No. 1656).

✓ Hypericum canadense majus A. Gray Man. Ed. 5, 86 (1868).
Gray wrote the variety name major which form has been used by botanists, nearly without an exception. Some hold this as a species distinct from H. canadensis, but it grows together with the species and grades into it. With the preceding on South

Dismal River, Aug 11. (No 1826).

Polygala verticillata Lin. Sp. Pl. 706 (1753).
This was collected by Mr. N. A. Tulen, near the railroad, west of Mullen, July 24. No specimen in my collection.

Elodes virginica (L.) Nutt Gen. N. A. Pl. 2:17 (1818); Hypericum virginicum Lin. Sp. Pl., Ed. 2, 1104 (1762).
In ~~the~~ wet meadows, but not common, Thedford, Aug 9; Natick, Sept. 11. (No. 1703).

Malvaopsis coccinea (Nutt.) O Kuntze Rev. Gen. Pl. 1:72 (1891); Malva coccinea Nutt. in Fraser's Cat. (1813).
Sandhills, near Thedford, June 14 (No 1357)

Linum rigidum Pursh Fl. Am. Sept. 210 (1814).
The most common form in Nebraska is about 3 or 4 dm. high with several slender ~~branches~~ stems from the perennial caudex and the leaves are distant. This was

collected near Thedford, June 19 and on Dismal River, July 26. (No. 1361). I collected also another form about 1½ dm. high, with a single stout much branched stem, the branches forming a nearly flat top. The internodes were about ½ the length of the leaves. Rail Road bank, Thedford, June 19; Mullen, July 20 (No 1285).

Oxalis stricta Lin Sp. Pl. 435 (1753).

River banks. Thedford, June 17; Dismal River, June 29. (No 1348).

Impatiens biflora Walt. Fl. Car. 219 (1788).

I swampy places, near South Dismal River, Aug 12. (No. 1681).

Celastrus scandens Lin. Sp. Pl. 196 (1753).

Common near Plummer Ford on the wooded bank of Dismal River, July 3, but not seen anywhere else. It is interesting to find this so far from the woody part of Nebraska. (No. 1453).

Ceanothus ovatus Desf. Hist. des. Arb. 2: 381 1809).

It ~~is~~ is lower and has thicker leaves than the form, collected by me in the Black Hills. One of the most common wody plants of the region, growing on the sandhills. Thedford, June 16 (No. 1325).

Ceanothus ovatus pubescens S. Wats. Bibl Ind N. A. Bot 166 (1878),*)

This ~~form~~ variety is perhaps the most common form of the species in the Sand Hill Region. It grades into the ~~species~~ typical form, but at the same time, ~~are~~ are broad-leafed ~~form~~ specimens scarcely distinguishable from C. americanus. Perhaps the two are but the extreme forms of a variable species. Thedford, June 17, 20; Plummer Ford, July 3; South Dismal, Aug 14. (No. 1352).

Vitis riparia Michx Fl. Bor.-Am. 231

*) Name and reference to C. ovalis Bigelow B in Torr. & Gray, Fl. N. A. 265 (1838).

1803.

The common form in Nebraska has ~~to~~ smoth leaves, with a broad sinus, It was collected on the banks of Dismal River south of Thedford, June 29 (No. 1448). another form with larger and thinner leaves, ~~and~~ a narrower sinus, and larger bunches of grapes was found at Plummer Ford July 3 (No. 1466). When young the leaves of this form are pubescent beneath. I think it is this form which has been regarded by Nebraska collectors as Vitis cordifolia. The latter, I think, does not grow in nebraska. It is distinguished by a different dentation to the leaves, which scarcely ever are lobed, by a narrow and acute sinus and more elongated clusters.

Parthenocissus quinquefolia (L.) Planchon in D.C. Mon. Phan. Vol 5, Pt 2: 448 (1887); Hedera quinquefolia Lin. Sp Pl. 202 (1753).

Banks of Middle Loup River, near Nantick, June 20. (No 1375).

, Acer Negundo L. Sp. Pl. 1056 (1753).

Here and there on the hillsides near the rivers, but few large or middle sized trees found. Norway, June 22, Plummer Ford, July 3 (No. 1406).

- Rhus glabra Lin Sp. Pl. 265 (1753).

Not common. Banks of Dismal River, June 28; Plummer Ford, Aug 22 (No. 1443).

~~Rhus canadensis trilobata (Nutt)~~;

✓ Rhus trilobata Nutt. in Torr. & Gray, Fl. N. A. 1: 219 (1838).

Local on the hills near the rivers. Norway, June 22; Dismal River, June 29; Forks of Dismal River, July 11 (No. 1407).

Rhus radicans toxicodendron (L).

✓ Rhus Toxicodendron Lin Sp Pl. 266 (1753).

I believe that the western form of the "Poison Ivy" has good right to a varietal name. It is always an upright ~~shrub~~ stiff shrub, 1/3 – 1 m. high, never climbing. In Eastern Nebraska the true Rhus radicans

Lin Sp. Pl. 766 (1753) ~~1753~~ is not uncommon in the woods. It is always tall climbing. If intermediate forms are found, they are rare. The variety is growing ~~in the~~ both in the woods and on the prairies. Common near the rivers. Natick June 20 (No. 1416).

Meli
~~Meli~~lotus alba Desr in Lam. Enc. Meth. 4: 63 (1797).

Escaped. Bank of Middle Loup, Thedford, aug. 26. (No. 1726).

Medicago sativa L. Sp. Pl. 778 (1753).

Escaped, Thedford, June 16 (No. 1328).

Lotus americanus (Nutt) Bisbk. Hort. Heid (1839) and Rydberg 14. suppl 137 (1840) ~~and Linnaea 132 (1840)~~; Trigonella americana Nutt Gen. N. A. Pl. 2: 120 (1818).

The oldest name is Lotus sericeus Pursh Fl Am. Sept. 489 (1814), but this name is preoccupied by L. sericeus DC. Cat. Hort. Monsp. (1813). Rail road bank near Mullen, July 24, ~~26~~; Forks of Middle Loup, July 26 (No 1592)

As Rhus radicans and R. Toxicodendron are published on the same page, but the former first, it must be regarded as the species, and the latter becomes the variety.

Psoralea argophylla Pursh, Flora. Am. Sept. 475. (1814).

The oldest name, P. incana Nutt. Fraser's Cat (1813) is a "nomen nudum". Prairies: Thedford, June 21, Plummer Ford, July 3. (No 1390).

Psoralea digitata Nutt. in Torr. & Gray, Fl. N. A. 1: 300 (1838).

This includes also P. campestris Nutt. in Torr. & Gray, Fl. N. A. 1: 301, which should have narrower bracts and obtuse leaves. It can however scarcely be separated from P. digitata even as a variety. Thedford, June 17, 20; Norway, June 22; Dismal River, June 27 (No. 1341.).

Psoralea lanceolata Pursh Fl. Am. Sept. 475 (1814). correct

Common in the sandhills. It spreads by a long slender rootstock, sending up shoots here and there. At Seneca, I found in a "blowout" a specimen ~~a~~ which had such a rootstock nearly 10 m. long. Thedford, June 16; Dismal River, June 27;

My Specimens belong to the form which Miss A. Vail in Bull. Torr. Bot. Club 21. 94 (1894) called Ps. micrantha Gray. I can not find any characters that will separate the two even as varieties. They grow together and grade into each other shown very well in the case of My No 53 (18[illegible] from Kearney. [illegible]

Mullen, July 24. (No. 1327).

Amorpha fruticosa Lin. Sp. Pl. 713 (1753).
Common along the streams, Thedford, June 15, Sept 8, &c. (No: 1314).

Amorpha canescens Nutt. Gen. 2: 92 (1818)
Common all over the sandhills. Norway, June 22; Dismal River, June 29; Plummer Ford, July 8; Thedford, Sept 8. (No. 1417).

Kuhnistera villosa (Nutt) O. Kuntze, Rev. Gen. Plant. 1: 192 (1891); Petalostemon villosum Nutt Gen. N. A. Pl. 2: 80 (1818).
Common on the sandhills: Mullen, July 24; North of Whitman, July 31. (No. 1589).

Kuhnistera purpurea (Vent) Mc Mill. Met. Minn. Vall. 329. (1892); Dalea purpurea Vent. Hort. Cels. 40 (1800).
Plummer Ford, July 3. (No 1472).

Kuhnistera multiflora ~~glandulosa (Coult.~~;

Pelatostemon multiflorum (Mutt.) J. Torr. Ann. Lyc. Nat. Hist. 7:92 ( )

Rare, sandhills, Middle Loup, north of Mullen, July 18 (No. 1850).

Astragalus canadensis L. Sp. Pl. 757 (1753).

This very likely should rather be names A. carolinianus Lin Sp. Pl 757 (1753) which is first on the page. ~~and also~~ The description fits better our western form. ~~except as to the number of the leaflets, which never are as many as~~ . Forks of Dismal River, July 11; South Dismal ± (fr.), Aug 14. (No. 1637.).

Astragalus crassicarpus Nutt., Frasers' Cat. (1813).

From the character of the fruit given in Frasers' catalogue, this can be identified as being the same as Astragalus caryocarpus Ker. in Edw Bot. Reg. 2: 176 (1816), and is an older name. Not common in the region. Collected in fruit only: Norway, June 22. (No. 1419).

Astragalus lotiflorus Hook Fl. Bor. Am. 1: 152 (1833)

Rare; only a few specimens collected in fruit near the Forks of Dismal River,

July 13. (No. 1547)

Astragalus ceramicus longifolius (Pursh); Psoralea longifolia Pursh 741 (1814).

The name longifolius could not be used as a specific name under Astragalus as there is already an Astragalus longifolius Lam. Enc. Meth. Bot. 1: 327 (1783), but well as a varietal name under Astragalus ceramicus Sheldon Minn. Bot. Stud. Bull. No 9: 19 (1894). Common in the sandhills: Thedford, June 16, 17, Norway, June 22. (No. 1322).

Spiesia Lamberti (Pursh) O. Kuntze Rev. Gen. Pl. 1: 207 (1891); Oxytropis Lamberti Pursh Fl. Am. Sept. 740 (1814).

On the sandhills near Thedford, June 17; Norway, June 17 (No. 1285).

Glycyrrhiza lepidota Pursh Fl. Am. Sept. 480 (1814)

In meadows, Thedford, June 20; Ainsworth, July 20. (No. 1384).

Meibomia canadensis (L.) O. Kuntze, Rev. Gen. Pl. 1: 195. (1891); Hedysarum canadense L. Sp. Pl. (1748 (1753)

Miss Anna M. Vail, in the Bull. Torr. Bot. Club. 1892, gives as a character of M. canadensis that the leaves are not reticulated below. In the form growing in the open meadows is this the case, however. Mullen, July 17, 24 (No. 1565). In another form growing in the shade, the leaves are very thin and smooth, with not prominent nerves beneath and scarcely reticulated. South Dismal, Aug. 12. (No. 1692)

Lespedeza frutescens (Wild.) Ell. Sk Bot. S. Car. & Ga. 2: 206 (1824) = Hedysarum frutescens Lin Sp. Pl. 746 (1753) (Willd Sp. Pl. 3: 1193 (1802). Sm Sp. Pl. (1055)

Rare; on the prairies near Halsey, Sept 11 (No. 1746).

Lathyrus ornatus Nutt. in Torr & Gray, Fl. N.A. 1: 277 (1838);

This has been confounded with L. polymorphus . Sandhills: Thedford.

June 16, 19 (No. 1320).

Apios apios (L.) Mc. Mill. Bull. Torr. Bot. Club ~~XIX~~ 19:15 (1892); *Glycine apios* L. Sp. Pl. 753 (1753).

On the wooded banks of Dismal River, near Plummer Ford, Aug 22 (No 1714).

Phaseolus pauciflorus Benth. Comm. Leg. Gen. 76 (1837).

South Dismal River, Aug 12; Thedford, Aug 19. (No. 1687).

Falcata comosa (L.) O. Kuntze Rev. Gen. Pl. 1: 182 (1891); *Glycine comosa* L. Sp. Pl. 754 (1753).

Rare on the banks of Middle Loup River, near Halsey, Sept 11, (No. 1749).

Falcata Pitcheri (T & G.) O. Kuntze Rev. Gen. Pl. 1: ~~292~~ 182 (1891); ~~*Amphicarpaea*~~ *Pitcheri* Torr. & Gray, Fl. N. A. 1: 292 (1838).

More common on the banks of both rivers, Plummer Ford, Aug 23; Halsey,

sept. 11. (No. 1715).

× *Prunus americana* Marsh Arb. Am. ♯ 111. (1785).

A very variable tree or shrub. The common form in Eastern Nebraska is a tree 3–6 m. high with oval or obovate leaves. This form was collected at Norway, June 22; Dismal River, June 29; Thedford, Aug 21; Mullen, Sept 15 (No. 1776) Another form with narrower leaves with long acuminations was also found. The trees were generally much smaller, 2–4 m. high. ~~Norway, June 22; Dismal River, June 29;~~ Thedford, ~~Aug 21~~ June 15; Mullen, Sept 15. (No. ♯ 1289). A third form, a low bush, 1–1½ m. high, with smaller, conduplicate leaves, having more rounded teeth and generally 2 glands on the leafstalk. The branches are more divaricate and the fruit about ½ the size of the type. South Dismal River, Aug 14. (No. 1693).

Prunus pumila ~~consociata~~ *Besseyi* Bailey (MS)*)

Pumila L. Mant 75 (1767) fide

The main branches prostrate, generally buried in the sand, but the shoots of the year mostly upright; leaves obovate, in form resembling those of *P. cuneata* (See Bailey Plums and Cherries), but much thicker and firmer and a little smaller, serrate but not as sharply as in *P pumila* proper; fruit large on a short, stout peduncle. A large leaved, more upright form is in the National Herbarium, labelled *P. Besseyi* Bailey I have not been able, however, to find anny description. I did not know that our Nebraska Sand-Cherry was ~~distinct~~ different from the Eastern one, until my attention had been called thereon by Prof Bailey (l c. pg). The specimens, in the National Herbarium has much narrower leaves of the true *P. pumila*. In the sand-cherry of Western Nebraska, the leaves are smaller and narrower than specimens from the sandhills and approach more those of *P. pumila* proper. I therefore ~~rather~~ regard it as a variety there of rather

*) Prof. Bailey writes that the ms. soon will go to the printer, and I suppose it will be printed before this report.

than a distinct species. Common throughout the sandhills; Thedford, June 16, &c. (No 1324).

✓ *Prunus demissa* Walp. Rep 2: 10 (1843).

On the hillsides and the dryer part of the valleys along both rivers; Thedford, June 14; Norway, June 22, Mullen July 27; Dismal River, June 27. (No. 1256).

✓ *Rubus occidentalis* L Sp. Pl. 493 (1753).

On my specimens the fruit was very dark purple rather than black, and hemispherical. On the wooded banks of Dismal River, near Plummer Ford, July 3 (1465).

✓ *Fragaria vesca americana* f Porter, in Bull. Torr. Bot. Club. 17: 15 (1890).

Our american form has thinner and smother leaves than the European and as a rule also shorter pedunceles and oftener elongated berries. Dr. Britton in Bull Torr. Bot Club. 222 (1892) makes it a distinct species and points out as distinctive character that the achenes

are superficial in the american species. But it is also the case the European. ~~D. C.~~ De Candolle in his Prodromus just uses this character to separate P. nevea from P. elatior and P. virginiana.
Plummer Ford, July 6. (No. 1481).

Potentilla arguta Pursh Fl. am. Sept. 736 (1814).
Plummer Ford, July 5 (No. 1474).

Potentilla pensylvanica ~~strigosa Pursh Fl. Lou. Mount. 76 (1767).~~ Am. ~~Sept.~~ 356 (1814).
Comparatively rare in the region. Forks of L. Middle Loup, July 27; South Dismal, Aug. 14. (No. 1611).

Potentilla norvegica Lin. Sp. Pl. 499 (1753).
Common. Plummer Ford, July 3; Haney's Ranch, Grant Co, Aug 4; Cody's Lakes, Aug 10. (No 1469).

Potentilla rivalis (Aug) pentandra S. Wats. Rev. Pot. in Proc. Am acad a. & S. 8: 553 (1849);
Potentilla pentandra Eng. in Torr. & Gray Fl. N. A.

1: 447 (1838).

Very much branched and nearly as stout as the preceding. May be this is a good species. Meadow, Haney's Ranch, Aug 5. (No. 1819).

Geum canadense Jacq. Hort Vind. 2: 82 (1772), not Murr

This is an older name for Geum album Gmelin, Syst 2: 861 (1796). Plummer Ford, July 3 (No 1406).

East of Mullen, July 19, I found two specimens with larger, light yellow petals and more incised leaves (No. 1608), perhaps a hybrid with G. Strictum.

Geum strictum Ait Hort. Kew 2: 217 (1789).

Common in the meadows along the rivers, Thedford, June 21; Dismal River, June 27; Natick, June 20. (No 1364). Some forms collected at Thedford, June 21 and Natick, June 20 (No. 1851), connect this with the next. They may be hybrids, but I rather believe that ~~this~~ Geum

Geum macrophyllum Willd. Enum 1: 557 (1809)

This has been regarded as the same as *Geum japonicum* Thunberg There is a specimen from Japan in the National Herbarium, labelled *G. japonicum* and this is of another species. Natick, June 20; Alexander Ford, July 3 (No. 1458).

strictum is, perhaps, but a variety of the next.

* Geum japonicum Thunberg Fl. Jap. 220 (1784).

This is an older name for Geum macrophyllum Willd Enum 1: 553 (1809). Natick June 20; Plummer Ford, July 3 (No 1408).

Agrimonia striata Michx Fl. Am. 1: 287 (1803).

I had been in doubt whether this was Agrimonia Eupatoria L. Sp. P. 448 or not. To me it seemed different from the European form. Dr. Britton in Bull. Torr. Bot. Club. ( ) shows it to be distinct. If ours is A. striata Michx I can not determine, but follow Dr. Britton in this respect. Plummer Ford, July 4; Forks of Dismal River, July 11; Mullen July 27; (No 1495).

✓ Rosa virginiana arkansana (Porter) ✓Best. Mill. Meth. Minn. Vall. 1: 263 (1892); Rosa

& Coult Syn.

Arkansana Porter, Fl. Col. 38 (1874).

Common throughout the state, but in the sandhill region confined to the hills nearest the streams. Thedford June 21; Dismal River, June 28; Plummer Ford, July 5 (No. 1392).

Rosa Fendleri Crepin Prim. Mon. Ros. Ext. from Bulletin Soc. Roy. Bot. Belg. 15:(92) 453 (1876).

I include under this all the roses collected on the lowlands and banks of the rivers, If all forms belong to one species, this is a variable one, and yet I can not distinguish any constant characters that will warrant a distinction even of varieties. The form that I think most typical has thin, nearly smooth leaves. The lower stipules are generally narrow and often entire, while the upper are broad and glandular toothed, Thedford, June 21; Dismal River, June 28; Plummer Ford, July 5. (No. 1354). No. 1313 is a similar form but with smaller leaflets, Thedford, June 16. No 1849 is a form similar to the first one, but with the leaves more hairy beneath

The fruit is large, ~~B~~spherical and bright red. The stipules are mostly narrow: Mullen, Aug. 17; Thedford Sept 7. The other forms collected, have the leaves & distinctly pubescent beneath, and even somewhat glandular. The ~~two~~ fruit are large, spherical ~~in one~~ and the sepals sometimes lobed and persistant in one, and the fruit smaller and pear-shaped and the sepals deciduous in the other. This notwithstanding I believe they also are forms of the same species. The first of the two (No. 1848) was collected at Natick, June 20; Dismal River June 27; the other (No. 1606) near the Forks of Long River, June 27.

Crataegus coccinea Lin. Sp. Pl 476, (1753).

On my specimens the corymbs are slightly villose. The trees were small, the tallest only about 4 m. high. Near the Forks of Dismal River, July 11 (No. 1528).

Ribes floridum L'Her. Stirp 1: 4 (1784)

My specimens are more tomentose than usually. Common along the streams. Norway, June 22, Dismal River, June 27 (No 1415).

Ribes aureum Pursh Fl. Am. Sept. 164, (1814).

The form with black fruit was not uncommon on the hillsides near the stream. Norway, June 22; Natick, June 20; Plummers Ford, July 3; Mullen July 27 (No. 1366). The form with golden yellow fruit was found only on the Middle Fork of Middle Loup, July 27 (No 1601).

Ribes gracile Michx Fl. Bor-Am. 1: 111 (1803).

Only a few bushes were found near Crumbs Horse Ranch on the Dismal, July 10 (No 1023).

Myriophyllum spicatum Lin Sp. Pl. 992 (1753).

What I take to be the ~~mi~~ typical

form was collected in leaves only in a lake in Grant Co. north-west of Whitman, sept 19. (No. 1785) another form having smaller leaves with shorter, more or less fleshy lobes, was found i bloom in Swan Lake 25 or 30 miles south of Whitman aug 7. (No. 1785).

✓ Hippuris vulgaris Lin. Sp. Pl. 4 (1753).

This is new to the state. The only locality known is a swamp near Haneeje Bos ranches, 25 miles south of Whitman, aug 4 (No 1645).

✓ Lythrum alatum Pursh Fl. Am. Sept. 334 (1814).

Common in the meadows; Plummer Ford, July 3; Forks of Dismal River, July 12. (No. 1468).

✓ Epilobium linearis Muhl. Cat 39 (1813).

In the western part of the region. Middle Fork of Middle Loup, July 26; north east of Whitman July 31 (No. 1603).

Epilobium adenocaulon Hausk. Oest. Bot. Zeit. 29: 119 (1819.)

Along the banks of Middle Loup, north of Mullen. July 16 – 19. (No. , a more simple and broadleafed form; No. , a more branched and narrower leafed form).

! *Circaea lutetiana* L. Sp. Pl. 9. (1753)

Common in shaded, wet places: Plummer Ford, July 3; Forks of Dismal River, July 11 (No 1463).

Oenothera biennis L. Sp. Pl. 346 (1753).

Common on the banks of Middle Loup River at Mullen, July 17, 18; also in Grant County, July 31 (No. 1578). ~~Some forms~~ Grades into the next by several forms.

Oenothera biennis parviflora

Flowers very small, of the size of the next species. Mullen, July 18, Middle

Fork of Middle Loup, July 26; South Dismal River, Aug 14 (No. 1573).

Oenothera sinuata Lin Mant. 2: 228.

[ ]

All my specimens are low, generally less than 1 dm. high, and the leaves sinuately toothed or entire. This is the only form growing in Nebraska. Thedford June 15 (No. 1302)

Oenothera rhombipetala Nutt in Torr & Gray, Fl N.A 1: 493 (1838).

This is common on the sandhills, near Plummer Ford, July 6–8 (No. 1510).

Oenothera albicaulis Pursh Fl. Am. Sept. 733 (1813) [Oenothera pinnatifida Nutt Gen N. A. Pl. 1: 245 (1818).]

This must take the name O. albicaulis Pursh, if the rules ~~laid down~~ adopted by the Botanical Club of the A.A.A.S. should be strictly followed. O. albicaulis of Fraser's Catalogue is a nomen nudum and the

first plant described under this name is the present plant, which ~~was to~~ Mr. Pursh took to be identical with that of Fraser's Catalogue. To avoid confusion, it would, perhaps, be better to use the name Oe. pinnatifida, but I have tried in every case to follow the rules as I understand them. Rare in the region, only a few specimens secured, at ~~the~~ ~~fork~~. Mullen, July 15 (No. 1293).

Oenothera pallida Lindl. Bot. Reg. 11: 948 ( ) [Oenothera albicaulis Nutt Gen. N. a. Pl. (1818) not Pursh]

From the foregoing follows that also this should change name. The common form in Nebraska has tall, upright white stem and narrow, linear or linear lanceolate or linear oblong leaves, with mostly entire margin. ~~Mullen~~ It generally grows on prairie soil. Mullen, July 19 (No. 1586).

Oenothera pallida latifolia n. v.

Leaves broad, 6-9 cm long and 2-3 cm. wide, remotely dentate, cinereous on both sides; stems diffuse and much branched. It is growing in "sand-draws" or on the banks of rivers. Mullen, July 17 &; Grant County, Aug 4 (No 1544). No. 112 of My Western Nebraska collections is the same. In a variable species as Oenothera pallida, perhaps the number of varieties should not be increased, but this is so remarkable and different from the common form, that I feel justified to add another name. It is true that there are some intermediate forms, as for instance No 1843 of this collection, from Mullen, July 17, but such forms are very rare. If no intermediate forms were to be found, we would call them distinct species.

— Oenothera serrulata Nutt. Gen. N. A. Pl. 1: 246 (1818).

A common plant throughout the region. — Rhedford, June 16; Plummer Ford,

July 3. (No. 1303).

Gaura coccinea Nutt Gen N. a. Pl. 1: 249 (1818).

Rather common on the prairies; Thedford, June 17 (No. 1343).

Gaura parviflora Dougl in Hook. Fl. Bor. am. 1: 208 ( ).

Rare; only one poor specimen secured, at Plummer Ford, July 3 (No. 1460).

Gaura biennis Lin Sp. Pl. 347 (1753)

Rare; on the banks of Middle Loup above Seneca, Sept 16 (No.)

Mentzelia nuda (Pursh) Torr. & Gray, Fl. N.A. 1: 535 ( ); Bartonia nuda Pursh Fl. am. Sept 328 (1814).

On a hill on the west side of South Dismal, Aug 14 (No 1689)

Opuntia Engelmanni Eng. Pac. R. R. Rep.

(1856)

Sium cicutaefolium Gmelin Syst. II pt 1: 482(179). or. Fl. Lib. 1: 201(")

In the lakes of Grant County, July 29 - 31; South Dismal, Aug 14 (No. 1615). New to Nebraska.

Berula erecta (Huds) Koch. Coville Bot. Death Valley Exp. in Cont. U.S. Nat. Herb vol. IV 4: 115(1893); Sium erectum Huds. Fl. Ang. 103(1762).

Common in and along Dismal River: Plummer Ford, July 6 ft; South Dismal, Aug 14 (No. 1517).

Cicuta virosa maculata (L) Coult & Rose Rev. N. A. Umb. 130(1888); Cicuta maculata Lin.

Common in the rivers. Plummer Ford, July 4; Mullen, July 17; Forks of Middle Loup, July 26 (No. 1491).

Cicuta bulbifera Lin

In swampy places in Grant County, Aug 4 and Sept 20; Thedford,

Sept 7 (No. 1737).

Sanicula canadensis L. Sp Pl. 235 (1753).

In woods, near Plummers Ford, July 3 (No. 1462).

Cornus stolonifera Michx. Fl. Bor. Am. 1: 97 (1803).

Common along the streams. Dismal River, June 27; Plummers Ford, July 6; South Dismal; Aug 14 (No 1435); Norway, June 12; Plummers Ford, July 3; Forks of Dismal River, July 11 (No. 1414). The latter is a form with slightly smaller leaves and more woolly pubescence.

Symphoricarpos occidentalis (R. Br.) Hook Fl. Bor. Am. 1: 285 ( )

Common on the prairies: Thedford, Sept. 8; Dismal River, June 28 and July 3; Hooker County, July 17 & 27

(No. 1442).

Galium trifidum Lin. Sp. Pl. 105 (1753) —
A small form collected in wet meadows at Norway, June 27, near Whitman, July 31 and Sept 20 (No. 1418). No 1840 is a taller form which is named G. tinctorum L. by A. A. Heller, Island Pond, June 26 (No 1840).

Galium trifidum latifolium Torr.

— In a wet meadow, near Whitman, July 31 (No 1815).

Galium triflorum Michx Fl. Bor. am. 1: 80 (1803).
— In wet meadows near the Forks of Dismal River, July 11 (No. 1519).

Galium aparine Lin Sp. Pl. (1753)
— In a swampy place near Dismal River, July 27 (No.).

Kuhnia eupatorioides ~~Linf.~~ glutinosa (Ell). Nuttall. Fl. Ames in Trans. St. Louis Ac. Sc. vol 5: 498 (1891); Kuhnia glutinosa Ell. Sk. Bot. S. Car. & Ga. 2: 293 (1824).

Sandhills, North East of Whitman, Aug. 1; Thedford, Sept. 8. (No. 1636).

Laciniaria squarrosa (Lin) Hill Syst. Veg. ~~Ed~~ 4: 49 (1762); Serratula squarrosa Lin Sp. Pl 818 (1753).

As a rule the specimens from the sand. hills have been placed with the variety ~~correspond best with~~ intermedia D.C.; but this the bracts scales of the involucre varies so much in the same plant, that I can not distinguish it Most of my specimens seem to be nearer to type even as a variety. Plummer Ford, July 6; Mullen, July 19; Middle Fork of Middle Loup, July 26; Plummer Ford, Aug 23; North of Whitman, July 31 (1505).

Laciniaria punctata (Hook) O. Kuntze Rev. Gen. Plant. 1: 349 (1891); Liatris punctata Hook, Fl. Bor. Am. 1: 306 (1833)

Also comparatively common: Plummer

Ford, Aug 22; Thedford, Sept. 13. (No. 1761). No. 1706 is a stunted form with broader leaves, collected on the rail road banks, near Thedford, Aug 19.

Eupatorium purpureum Linn, Sp Pl. 838 (1753).

Common along South Dismal, Aug 12. (No. 1682).

Eupatorium perfoliatum Linn Sp. Pl. 838 (1753).

Together with the preceding, Aug 12 (No. 1683).

Grindelia squarrosa (Pursh) Dunal. in DC Prod. 5: 315 (1836); Donia squarrosa Pursh, Fl. Am. Sept. 559 (1814).

Only a few stunted specimens collected, 2 miles west of Thedford, Sept. 12. (No. 1760).

Coreopsis ~~tiloba~~ villosa (Pursh) Nutt., Trans. Phil. Soc. 8: 317 (1841) = Anthemis

villosus Pursh Fl. Am. 564 (1814).

Otto Kuntze and McMill. have adopted Diplogon Raf., which was published earlier in the year 1818; but this name had been used before by Poiret for Diplopogon. This plant is very variable and two of my forms might have as good right to varietal names as others already described. Specimens of the more typical form were collected: 3 miles north east of Whitman, July 31; Cody's Lakes, aug 9-12; Thedford, aug 24 and Sept. 11 (No 1633).

A form with oblong, nearly glabrous or slightly scabrous, thin leaves with sparsely ciliate margins was found near Whitman Sept 19 (No. 1781).

Another, similar form with linear lanceolate leaves with revolute margins, was found near Mullen, Sept 14 (No 1766).

Solidago missouriensis Nutt Journ. Ac. Phil. 7 (new. ser.): 32 (1834).

The original S missouriensis is the

low form with a short crowded panicle, which was named by Gray as var. montana, was collected at Thedford, Sept 11 (No. 1750).

The taller form, ~~which Gray~~ with more spreading panicle, the S. Missouriensis of Gray's Synoptical Flora, should ~~be~~ have the name S. missouriensis glaberrima [S. glaberrima Martens Bull Acad Brux. 8: 68 (1841)], if held as a distinct variety. The great variation in the species of Solidago is well known. If the variety is admitted, I am afraid ~~we had to~~, in order to be consistent, we would be obliged to add one or two varieties to nearly every one of the species of this genus. Plummer Ford, Aug 23; north east of Whitman, July 31. (No. 1632).

Solidago serotina Ait. Hort. Kew. 3: 211 (1789). not Willd.

Here and there, in copses. ~~Whitman~~, Aug Haney's Ranch, Aug 5, Cody's

Lakes, aug 10; South Dismal River, aug 12. (No. 1648).

Solidago canadensis Lin. Sp. Pl. 878 (1753).

A hirsute form approaching the varieties scabra and procera of Torr. & Gray. Thedford, Sept 12 (No 1737); Mullen Sept 14 (No 1767).

Solidago canadensis gilva canescens Low Sp. Pl.

Low, 3-4 dm. high; leafy; leaves 3-6 cm. long oblanceolate — lanceolate, remotely serrate above the middle or entire; the whole plant yellowish green, finely pubescent canescent; often somewhat scabrous; inflorescence dense, contracted with short recurved branches; heads smaller than in S. canadensis. It resembles somewhat the varieties canescens and ~~virgonica~~ in the pubescence but differs from both in being much lower and more leafy. The leaves resembles somewhat those of the latter, but the bracts are very different. It is growing in sandy soil near water, Codys

Lakes, Hooker ~~Co. Nebr~~ county, Nebraska (No. 1662). Specimens of the same variety are preserved in the National Herbarium, from the following localities:— Dodge City, Kansas, aug 19, 1890, B. B. Smyth, No. 162; Montana (locality not given), L. F. Ward. (This is labelled S. nemoralis). No. 34 of ~~Hall~~ Nicollet's North Western Expedition, labelled S. incana ? Torr & Gray, collected July 25. 1839, Saline swampy margins of the Lake of the Woods near Devils Lake, Minn., is a form with narrower leaves).

—

Solidago nemoralis Ait. Hort. Kew. 3: 213 (1789).

~~Two~~ forms were collected One is ~~3~~ about 6-8 dm. high with an open panicle, resembling somewhat a large form of S. ~~canadensis~~ auriculata. It is evidently seaborne. Thedford, sept 8, (No. 1663). (Cody's Lakes, aug 9-12)

The other form is lower, 4-6 dm high with narrow, nearly spikate panicles. Thedford ~~&~~ Sept 8 - ~~(illegible)~~. (No. 1751).

— —

Solidago radula Nutt. Jour. acad. Phil 7 (new ser.): 327 (1835).

I name it by that name, although I am not certain that it is S. radula of Nutt. In the National Herbarium, there are at least three Solidagos placed together under this name. One is named by Dr. Gray, but this is not the same as any plant. An other, not unlike mine, but greener, has passed through the hands of Dr. Torrey.

My plant is low, 2-3 dm high, very leafy; leaves thick, tripplenerved, gradually diminishing upwards, the lower 5-7 cm long and 2-3 cm. wide, obovate, coarsely and remotely serrate upwards; the whole plant scabrous, and somewhat canescent; panicle short of short recurved branches; heads larger and with broader bracts than in S. Californica, lower forms of which it resembles. Specimens in the National Herbariums, collected by Orcutt (89, (partly) in California and by C. G. Pringle, at Tehachipi Pass, California, resemble this in growth, but have the pubescence

of S. Californica. The specimens in the National Herbarium are divided between Solidago radula and S. nemoralis incana: viz under the first: No of Whipple Expedition, antilope Hill of the Canadian; S. M. Rothhammer No. 488, Upper Missouri, 1864. and under the second, 2 sheets, collected by L. F. Wards in Montana, 1883; 2 sheets by Dr. Wilcox, Nebraska, 1887; P. A. Rydberg, No 157, Western Nebraska 1891. A Specimen, collected by E. Palmer in Arizona, 1869, has no name. Near the railroad, Mullen, Sept 18, (No 1770).

× Solidago rigida L. Sp. Pl. 880 (1753).
West Cody's Lake, aug 10; Plummer Ford aug 22 (No. 1666).

Solidago graminifolia (L.) Ell. Sk. Bot. S. Car. & Ga. 2: ~~344 (1753)~~ 391 (1824); Chrysostoma graminifolia Lin Sp. Pl. 2: 841 (1753)

S. lanceolata Lin. Mant. 114 (1767) must

give _____ place for the older name, Thed. ford, Sept. 8 (~~No.~~ No. 1738).

Haplopappus spinulosus (Pursh) DC. Prod. 5: 347 (1836); Amellus spinulosus Pursh Fl. Am. Sept. 564 (1814).

Throughout the sandhills, but local. Thedford, June 19; ~~Sept.~~ Dismal River, June 27; Plummer Ford, July 4-8; Mullen, ~~July~~ July 26; (No. 1403).

x Aster novae-angliae Lin. Sp. Pl. 875 (1753)

I found specimens with red as well as blue rays, but do not think this difference in color should make a variety. Thedford, Sept 7; Halsey, Sept 11 (No. 1735).

Aster oblongifolius Nutt. Gen. 2: 156 (1818).

Not common: Grant Co, near Whitman, Sept 19 (No. 1780).

---

x Aster oblongifolius rigidulus Gray

Syn. Fl. Vol. 1, pt 2: 179 (1884).

Perhaps the name should be A. longifolius Kumleini (Fries) ~~in dist~~. The date of publication of Aster Kumleini Fries in Dist. Mus. Upsa. No 5, I do not know. More common on the sandhills and dry prairies. Thedford, Sept 9 (No. 1743).

Aster paniculatus (?) Law. Dict 1: 306( )

I refer two Asters growing ~~in th~~ commonly along the streams, to this species, although with some doubt. They differ both from the common form of A. paniculatus in having larger heads, pubescent stem, and much elongated foliaceous bracts. The latter character lead me to believe at first that they belonged to A. foliaceus Lindl. By comparing them with the collections of forms in the National Herbariums, I found that they ~~to~~ are not related to that species. One form has the leaves of the typical A. paniculatus. This was collected at Thedford, Sept 7, and near Whitman Sept 18

(no 1734) The other has shorter, more or less oval thicker leaves. Plummer Ford, Aug 22 (No. 1724).

Aster multiflorus Ait. Hort. Kew 3: 203 (1789).

Dry prairie: Thedford, Aug 26; Sept 9 (No. 1731).

Aster multiflorus stricticulmis Torr & Gray, Fl. N.A. 2:124 (1840)

Rare, meadow: Thedford, Sept 9 (No 1752).

Aster multiflorus ~~incano-pilosus~~ (Lindl) n.n. ~~commutatus Torr. & Gray Fl. N.A. 2:14~~; Aster ~~ramulosus incano-pilosus~~ Lindl in Hook Fl. Bor. Am. 2: 13 (18),

This is A. commutatus Gray Syn. Fl. Vol 1; pt 2:185. I believe however that this must be a variety of A. multiflorus as ~~they two are very hard to~~ it is very hard to draw a line between the two Mullen Sept 14 (No. 1765). Specimens with blue flowers were collected at Holmes, Sept 11 (No. 1754).

(No. 1734). The other has shorter, more or less oval thicker leaves. Plummer Ford, Aug 22 (No. 1724).

Aster salicifolius Ait Hort. Kew. 3: 203 ( ) Law. Enc. Meth. 1: 306 ? ( )

This seems to have a little larger heads than usually, resembling somewhat A. longifolius. The bracts are narrow, thin acute, but with a broader green tip. In Meadows: Redford, Sept 7: Whitman, Sept 19 (No. 1739).

Aster junceus Ait Hort Kew 3: 204 ( )

It is like Minnesota specimens in the National Herbariums under this name. It seems however to have narrower leaves than usually. The bracts have also broader more or less purplish tips. It resembles somewhat a simple, narrowleaved A. Tradescantii, but the heads are larger. It also comes near A. ericoides Pringlii Gray, from which it is distinguished by the broader bracts. In

1053

Aster canescens Pursh Fl. Am. Sept. 2: 547 (1814)

ar.

A very tall form with many large, subcapitate heads and broad, glabrous, dentate leaves; otherwise like the next Plummer Ford Aug 23 (No 1727).

Aster canescens viscosus Gray Syn. Fl. ed 1, pt 2: 206 (1888); Dieteria viscosa Nutt Trans. Am. Phil. Soc. 7: 300 ~~(1841)~~ ~~(No. 1724)~~ (1841)

Gray cites Diplopappus incanus Lindl. Bot. Reg 1693 as a synonym, but to me this seems to be something else. Mullen, Sept 18 (No. 1834).

wet meadows, near Thedford Aug 1, 1901 (No 1701). The same form was collected by me in the Black Hills of South Dakota in 1892.

Aster umbellatus, Torr. & Gray Syn Fl. Vol. 1, pt 2: 197 (1848.

On the banks of the Middle Loup, Halsey, Sept 11 (No. 1748). This has not been reported for Nebraska before.

Erigeron bellidiastrum Nutt. Trans Am. Phil. Soc 7: 307 ( )

Smaller forms of this can not be separated from E. divergens, except by the achenes. In E. bellidiastrum they are truncate, tipped with a whitened disk, which bears a simple pappus; the pappus of E. divergens is double, the outer of squamellate short bristles (in more rich soil, especially among bushes, it becomes 6-8 dm high with larger leaves and heads; Thedford, June 17; Forks of Middle Loup, July 26; Dismal River, June 27 (No. 1350). In poorer sandy soil it becomes lower,

1-3 dm. high, more grayish, and with smaller heads and leaves: This form has been mistaken for E. divergens. Forks of Dismal River, July 12 (No. 1536).

Erigeron ramosus Beyrichii (Fish & Mey); Stenactis Beyrichii Fisher and Mey. Ind. Sem. Petrop 27 (1824).

This is the common form of E. ramosum (Walt) S.P. Bol. Cat. N.Y. 27 (1888). in the central and wester parts of Nebraska. Plummer Ford, July 3; Dismal River, July 11 (No. 1451).

Erigeron canadensis Lin. Sp. Pl. 863 (1753).

This is a very variable plant. The height varies from 2 m. down to a few cm. The more tall and simple, or more typical form was collected on the South Dismal, Aug 12 (No. 1678). On a "prairie dog town", near Thedford, all specimens were low, much branched from the base and much diffuse. These could not be distinguished from E. divaricatus

except by their slightly broader leaves, the more racemosely disposed panicle, and the white rays. ~~Sept.~~ Aug 19 and Sept. 8 (No. 1699).

Antennaria plantaginifolia (Lin.) R. Br. Trans. Lin. Soc. 12: 123 (1818); *Gnaphalium plantaginifolium* Lin. Sp. Pl. 850 (ed. II, [illegible]) 1330.

The general growth is that of *A. dioica* except that the stolons are short, but the heads ~~the~~ like those of *A. plantaginifolia*. The leaves are spatulate 3–4 cm long, one-nerved or more or less indistinctly 3-nerved. Head about 1 cm. high; bracts of the sterile heads broad and obtuse; those of the fertile ones narrow, acute or obtuse, in both the base light brown with a papery portion, constituting more than half the length of the scale. All western forms ~~and~~ I have seen which are labelled *A. plantaginifolia* and some also labelled *A. dioica* belong here. It is common in Nebraska and the Black Hills, but rare in the sandhill region

Hillside, Thedford, June 15 (No. 1282).

Iva xanthifolia Nutt. Gen. 2: 185 (1818).

2 old fields: Thedford, Sept 7; near Whitman, Sept 19 (No. 1740). On brackish soil near a dried lake in Grant County, I found a low form with small leaves, 3–5 cm. long, entire or 3-lobed, oblong to ovate, more green even beneath, with more rounded teeth than in the typical form, and with the heads more or less crowded together in glomerules. Sept. 19 (No. 1783).

× Ambrosia artemisiaefolia L. Sp. Pl. 988 (1753).

Not common in the region. (West Cody's Lake, Aug 10; Thedford, Sept. 11 (No. 1667).

Ambrosia psilostachya DC. Prod 5: 526 (1836).

As the preceding very variable.

young specimens often very hard to distinguish from ~~it~~ the same. A. psilostachya is very common throughout the region. East Codyo Lake, aug 10; ____ Plummer Ford, aug 22; Grant County, ____ near Whitman, aug 4 (No. 1668). a stout, very hairy and strigose form was collected near West Codyo Lake, aug 10. (No. 1824).

Xanthium canadense

____ Not common. Codyo Lakes, aug 9; 3 miles north west of Whitman, Sept 19 (No.)

X ____ Rudbeckia hirta Linn. Sp. Pl. 907 (1753)

____ Plummer Ford, July 3; Mullen, July 18 (No. 1470).

____ Lepachys columnaris (Pursh) Torr. & Gray, Fl. ~~U.S.~~ N. A. 2: 315 (1841); Rudbeckia columnaris Pursh. Fl. Am. Sept.

75 (1814).

Thedford, June 21; Dismal River, June 7; Plummer Ford, July 3 (No. 1395).

Lepachys columnaris pulcherrima (Don) Torr. & Gray, Fl. N. A. 2: 313 (1841); Ratibida columnaris pulcherrima Don. Brit Fl. Gard. n. ser. 4: 361 ( ).

This deserved scarcely a varietal name. Dismal River, June 28; Mullen, July 17 (No. 1445).

Helianthus annuus Linn. Sp. Pl. 904 (1753).

Not common, but represented by the next. Banks of South Dismal Aug 12 (No. 1676).

Helianthus petiolaris Nutt. Journ Acad. Phil. 2: 115 (1821).

In the typical form, the leaves are small ovate, and cuneate at the base. Common: Thedford, June 19; Grant County, near Whitman, Aug 3; Mullen, July 22 (No. 1362).

Helianthus petiolaris patens (Lehm);
Helianthus patens Lehm Ind. Sem. Hamburg 1821, acc. to DC. Prod. 5: 586.

My specimens agree fully with the descriptions of this species, but I believe it to be a variety of H. petiolaris perhaps a luxuriant form only; but it differs considerably from H. petiolaris in general growth, in which it resembles more H. annuus. The heads are of the size of a middlesized H. annuus, but with the bracts of petiolaris. They are born on a long peduncle which is more or less fleshy just below the head. The leaves are large, broadly ovate or subcordate as in ~~H.~~ annuus but with longer petioles. In a fire brake, 3 miles North East of Whitman, Aug 1. (No. 1635).

Helianthus diffusus Sims. in Bot. Mag. vol. 45: t. 2020 (1810) not Moench

The name H. rigidus (Cass.) Desf. Hort. Paris ed. 3 (1829) is also antedated by H. scaberrimus ~~Ell.~~ Sk.

Bot. S. Car. & Ga. 42-3 (1824). This later name excludes H. scaberrimus Benth. Bot Sulph. (1844) which becomes H. Bolanderi Gray. Proc. Am. Acad. 7: 344 ( )

Sandhill, 3 miles north East of Whitman, ~~Aug~~ July 29-31 (No. 1627).

Helianthus.

The head is not unlike those of H. grosse-serratus and maximiliani, but the leaves are very thin, with ~~on~~ slender, margined and ciliolate petioles. Only one specimen in bloom secured, near Cody's Lakes, Aug 10 (No. 1825).

Helianthus giganteus

Only a few specimens belonging to this species were secured, near West Cody's Lake, Aug 10 (No. 1669).

Helianthus maximiliani Schrader

The specimens differ somewhat from

the common form there in, that the stem is unusually smooth and shining. West Cody's Lake, Aug 10; Halsey, Sept 11, Thed. Pod, Aug 19 (No. 1673). Another form, I saw frequently throughout Grant County. It must belong to this species although the leaves were all opposite. The bracts of the involucre were very broad, undoubtly a monstrosity, which very likely was produced by the action of insects. The plants were generally only 2-3 dm high. Collected 15 miles south of Whitman, Aug 3 (No. 1640).

— Helianthus grosse-serratus Martens Bul. Sem. Hort. Louvain. 4 (1839). N.C.

V — The leaves of my specimens are shorter and less coarsely serrate than usually Aug 14, suppl: 133 (1840) Mullen, Sept 14 (No 1767).

X — Bidens laevis (L.) B.S.P. Cat. N.Y. 29 (1888); Helianthus laevis L. Sp. Pl. 906 (1753).

— I have been in doubt where to place our Nebraska specimens, whether

with B. laevis or with B. cernua. The heads are only little nodding if at all; but the rays are much shorter than in the true B. laevis and the outer bracts often longer than the head. Common; Mullen, Aug 17, Thedford, august 26 (No. 1696).

X.— Bidens frondosa Linn. Sp Pl. 832 (1753). Not fully as common as the preceding. Thedford, aug 19 & 26, Halsey. Sept 11 (No. 1707).

X. Bidens trichosperma tenuiloba (Gray) Britton Bull. Torr. Bot Club 281 (1893); Coreopsis trichosperma tenuiloba Gray Syn. Fl. Vol. 1, pt. 2: 295 (1884)

Some specimens, not in bloom yet, with broader lobes, were found in Grant County, aug 3. These may be the true Bidens trichosperma. Thedford, aug 19 & 26; Cody's Lakes, aug 10; ~~Thedford, &c~~ (No. 1642).

Thelesperma gracilis (Torr.) Gray Syn

Journ. Bot. 1: 252 ( ), Bidens gracilis Torr. Ann. Lyc. N. Y. 2: 215 (1828)

On the sand hills near Dismal River, July 28; & Plummers Ford, July 3; Mullen July 17-24 (No. 1444).

Hymenopappus filifolius Hook. Fl. Bor. Am. 1: 317 ( )

I think this is the original H. filifolius of Hooker. Gray includes also H. luteus Nutt in this species which I think makes it a very complex one. I hew H. tenuifolius could with perhaps equal right be included there in also. Our specimens have always yellow flowers and are scarcely scapose. Mullen, July 17; 20 miles south of Whitman, aug 5 (No. 1554). No. 321 is a more leafy form with larger heads. Thedford, June 16; Mullen, July 17; Plummers Ford, July 8; Dismal River, July 27.

X Helenium autumnale Linn Sp. Pl. 866 (1753).

Common along South Dismal, aug 14 & Plummer Ford, aug 22 (No 1690).

Artemisia biennis Willd. Phytog. 11 (1794).

All my specimens seem to annual, weak and brightly green. In dry lakes North west of Whitman, Sept 19 (1753).

Artemisia frigida Willd Sp Pl. 3: 1838 (1803).

On a dry hill, south of Thedford, Aug 8 (No. 1733).

Artemisia canadensis Michx Fl. 2: 128 (1803)

Sandy prairie, Thedford, aug. 26 and Sept 8 (No. 1730).

Artemisia gnaphalioides Nutt. Gen. N.A. Pl. 2: 143 (1818).

The relationship between this and A. ludoviciana Nutt is a little unclear,

but as A. gnaphalioides appear first on the page in Nutt. Gen., where both were originally described, it must be regarded as the species, and must retain its name even if the are regarded as one. Pinedford, Aug 26 (No. 1725).

X Senecio aureus compactus Gray Syn. Fl Vol 1, pt. 2: 391 (1884).

My species differ in having a more open cyme of fewer heads. May be this is a distinct species. The narrow, fleshy and stiff leaves, only toothed at the apex is a conspicuous character. On the sandhills only, Pinedford, June 15, 16, & 19 (No. 1311).

---

* Senecio Douglasii DC. Prod. 6: 429 (1837).

On the sandhills; South Dismal River, Aug. 17; Plummer Ford, Aug 23; North West of Whitman, Sept 19 (No. 1677).

+ Cnicus altissimus (L) Willd. Sp. Pl.

3: 1670 (1803); Carduus altissimus Lin
Sp. Pl. 824 (1753).

Not very common as in Eastern Nebraska,
South Dismal, Aug 12 (No. 1685). No 1724.
is a form approaching the variety dis-
color (Muhl) Gray. Syn. Fl Vol. 1, pt 2: 404 (1884)
Plummer Ford, Aug 22.

Cnicus Pitcheri Torr., in Eaton, Man.
Ed. 5, 180 (1829).

On the Nebraska forms, the lobes of
the leaves are seldom 5 cm long, sometimes
scarcely more than 1 cm and generally
8-12 mm. wide. Common in the sand
hills; Thedford, June 17, Plummer
Ford, July 5. (No. 1306).

Lygodesmia juncea (Pursh) Don, in
Hook. Fl. Bor.-Am. 1: 295 (1833); Prenanthes
juncea Pursh. Fl. Am. Sept 498 (1814).

Dismal River, June 27; Mullen, July
17 (No. 1432).

Lygodesmia rostrata (Gray) Gray. Proc.

Am. Acad. 9: 217 (1874); L. juncea rostrata Gray. Proc. ~~Acad~~ Acad. Phil. 69 (1863).

The pappus is white or sordid, finely papillose under the lens, which makes the distinction between Lygodesmia and Stephanomeria still less. May be the two should make one genus. Dismal River, June 27; Mullen, July 17 (No. 1432).

Nothocalais cuspidatum (Pursh) Greene. Bull. Cal. Acad. 2: 55 (1886); Troximon ~~a~~ cuspidatum Nutt.

Only 4 small specimens in fruit found west of Thedford, June 14 (No. 1252).

X Lactuca canadensis L. Sp. Pl. 796 (1753).

Most of the upper leaves are not pinnatifid and the panicle sometimes more open. Plummers Ford, Aug. 23; Thedford, Sept 12 (No. 1755).

X Lactuca ludoviciana (Nutt.) Gen. ~~A. Pl.~~ DC. Prod. 7: 141 ( ); Sonchus

ludovicianus Nutt. Gen. N. A. Pl. 2: 125 (1818).
River bank, near Mullen, July 17 (No. 1505). A lower, purplish form was growing on the hillsides, near Plummer Ford, July 6 (No. 1507).

X Lactuca pulchella (Pursh) DC. Prod. 7: 134 (1838); Sonchus pulchellus Pursh Fl. Am. Sept. 502 (1814).
Mullen, July 18; North east of Whitman, Aug 2 (No. 1570).

X Lobelia syphylitica L. Sp. Pl. 931 (1753).
Not uncommon on South Dismal River, Aug 9 – 14 (No. 1680).

X Lobelia spicata hirtella Gray Syn. Fl. Vol 2, pt. 1: 6 (1878).
Rare, in a meadow 4 miles north east of Whitman, Aug 1; Redford, Aug 26 (No. 1818).

Legouzia perfoliata (L.) Dur. Fl. Bourg. 2: 26 (1782); Campanula perfoliata Lin Sp. Pl.

169
~~239~~ (1753).

Legouzia Durr. is the oldest generic name that can be used, *Pentagonia* Siev., *Specculum* Hall and *Specularia* Heist being older than 1753 and as far as I have been able to find not used between that date and 1782. On hillsides here and there. Thedford, June 17; Dismal River, June 29. (No 1346).

× *Campanula aparinoides* Pursh Fl. Am. Sept. 159 (1814).

Common in wet meadows throughout the region. Plummer Ford, July 3 & 4; West Cody's Lake, Aug 10. (No. 1457).

× *Androsace occidentalis* Pursh. Fl. Am. Sept. 137 (1814).

Only 3 small specimens collected in a prairie dog town south east of Thedford, June 15 (No. 1299).

Lysimachia thyrsiflora Lin. Sp. ~~Pl. Dan~~ Pl. 147 (1757).

The flowers in my specimens are smaller than usually and the teeth between the lobes of the corolla are obsolete. The leaves of all specimens I found near Thedford seem to be hairy beneath. It is very likely not hairs, but probably a parasitic alga. Middle Loup River, near Thedford, June 14–16; 3 miles north east of Whitman, July 29 (No. 1762).

Fraxinus pensylvanica Marsh Arbust. am. 57 (1785)

This seems to grade directly into the next. Thedford, June 21 (No. 1839).

Fraxinus pensylvanica lanceolata (—) Sargent.

This has been regarded as a distinct species under the name of Fraxinus viridis Michx., but seems not to differ from the preceding except in the lack of the pubescence on the young shoots. Both are found here

and there on the hillsides; but I did not see any large trees. Seneca Sept 9 Dismal River, July 3. (No 1391). ~~A form~~ A few young trees were found on the South Dismal River that had very large leaflet.

X *Apocynum cannabinum* L. Sp. Pl. 213 (1753).

The specimens from Thedford and Natick, are low and with smaller leaves than usually. Thedford, June 17; Natick, June 20; Norway, June 22; North east of Whitman, Aug 1 (No 1353).

X *Asclepias incarnata* L. Sp. Pl. Ed. 2, 314 (1762).

Common in the meadows. Forks of Dismal River, July 11; Middle Loup, Mullen, July 17; South ~~Fork~~ Dismal, Aug 14; Thedford, Sept 7 (No. 1518).

V *Asclepias speciosa* Torr. Ann. Lyc. N. Y. 2: 218 (1834).

Throughout the region, but local. Rail road bank, Thedford, June 21; Dismal River, June 28 & 29. (No 1383).

Asclepias syriaca Linn Sp Pl. Ed. 2., 313 (1762).

Rare. Forks of Dismal River, July 12.; Middle Loup, Mullen, July 19. (No 1532).

Asclepias arenaria Torr. Bot Mex. Bound. 162 (1858) ~~Ibos~~

This is very common in the sand-hills around Dismal River, but only few specimens in bloom were secured. Plummer Ford, July 5; South Dismal River, Aug 14 (No. 1500).

Asclepias ~~arenaria Torr.~~ verticillata pumila Gray. Proc. Am. Acad. 12: 71 (1876.

On a prairie dog town, Thedford Aug. 9 (No. 1700).

Acerates angustifolia (Nutt) Decaisn, in DC. Prod 8. 522 (1844); Polyotus angusti

folius Nutt, Trans. am. Phil. Soc. (ser 2) 5: 201 (1839).

Mr. J. M. Holzinger ~~writes thus with~~ asclepias stenophylla ^ ~~Acerates~~ acerates auriculata ~~Asclepias stenophylla~~. In Nebraska, at least as far as I know, they are differed in certain points. Asclepias stenophylla ~~is~~ may which is the same as ~~Acerates Polyotus angustifolia Nutt~~ Acerates angustifolia (Nutt) DC., has generally several stems from each root (not shown in the specimens); these stems are more or less ascending and more or less hairy or pruinose; the divisions of the hood are ~~whitish~~ yellowish white and narrow. In Acerates auriculata the stem is strict and nearly without exception single from the root, perfectly smooth and even with a bloom; the divisions of the hood orange yellow and broad. Evidently they are very nearly related and may be grade into each other which I have not found them do in Nebraska. They should, however, belong to the same genus, and I believe rather

to Acerates than to Asclepias. Acerates auriculata grows on the table land; A. angustifolia in the sandhills. This may count for the difference. Norway, June 23; Plummer Ford, July 3-6 (No. 1420).

Acerates lanuginosa (Nutt) Dcne. in DC. Prod. 8:523 (1844); Asclepias lanuginosa Nutt. Gen N. A. Pl. 1:168 (1818).

Local in the sandhills, Thedford, June 16-19. (No. 1326).

Acerates viridiflora (Raf) Ell. Sk. Bot. S. Car. & Ga. 1:317 (1821); Asclepias viridiflora Raf. Med Rep. 11:360 (1808).

Very variable. Two varieties have been proposed, but the grade into the typical form and in to each other. They should rather be regarded as forms than as varieties. The typical form was collected at Norway, June 22 (No. 1424); the var. lanceolata (Dves) Torr. Fl. N. J. 284 (1824) or A. lanceolata Dves Am. Journ. Sci. 3: 252 ( ) was more

comon. Thedford, June 15; Norway, June 23; Plummer Ford, July 3 (No. 1305); var. linearis (Raf.) Ell. Gray Syn. Fl. Vol 2, pt 1: 99 (1878), was collected at Norway, June 23 Plummer Ford, July 3, (No. 1423).

Gentiana Andrewsii Griseb. Gent. 287 (1839).

Not uncommon in the meadows, Thedford Sept 7; Mullen, sept 16 (No. 1736).

Collomia linearis Nutt Gen. N. A. Pl. 1: 126 (1818).

In fruit only. Plummer Ford, July 5 (No. 1502).

Gilia longifolia (Torr) Don. Gard. Dict. 4: 245 (1838); Cantua longifolia Torr Ann. Lyc. N. Y. 2: 221 (1834).

Prof. Greene separates Gilia and Navarretia. If they should constitute only one genus, the name becomes Navarretia longifolia (Torr) O.K. Rev. Gen. Pl. ~~Vol 2, pt~~. 2: 433 (1891). Forks of

Lappula deflexa americana (Gray) M.c Mill Mella
Minn. Valley. 440 (1893). Echinospermum deflexum ameri-
canum Gray Proc. Am. acad. 17: 224 (1882).

Rara, Plummer Ford, aug 22 (No.)

Nebraska specimens have much broader and shorter leaves than the usual form.

Middle Loups, July 27; Plummer Ford, Aug 23; South of Whitman, Aug 3; Cody's Lakes, Aug 11. (No. 1605).

Macrocalyx nyctalea (in) O. Kuntze Rev. Gen. Plant. 2: 434 (1891); = Bonnaea nyctalea Lin Sp. Pl. 160 (1753).

Only 4 small specimens in fruit were collected in a "prairie-dog town" near Thedford, June 15 (No. 1301).

Lappula Redowskii occidentalis (Wats) Kuntze; ~~Kings Rep 5: 246 (1874).~~ Echinospermum Redowskii occidentalis Wats. Kings, Rep. 5: 246 (1871) Prof McMillan in Meth. Minn. Vall. 441; has Lappula Redowskii pilosula; but this should not be used as Cynoglossum pilosum in Nutt. Gen N. A. Pl. 1: 114 is simply a misidentification. Nuttall mistook our plant for C. pilosum Ruiz & Pav. Fl Peruv. 2: 6 ( ).

Cryptanthe crassisepala (Torr & Gray) Greene, Pittonia 1: 112 (1887); Eritrichium Crassisepalum Torr & Gray. Pac R. R. Rep 2: 171

(1887).

Prairie dog towns: Thedford, June 20; Dismal River, June 27 (No. 1307).

✓ Cryptanthe Fendleri (Gray) Greene Pittonia I.: 120 (1887); Krynitzkia Fendleri Gray Proc. Am. Acad. 20: 268 (1885).

Prairie near Dismal River, June 27 (No. 1429).

Orocarya suffruticosa (Torr) Greene, Pittonia 1: 57 (1887); Myosotis suffruticosa Torr Ann. Lyc. N. Y. 2: 225 (1834).

Prairies: Plummer Ford, July 8; Forks of Dismal River, July 11 (No. 1514).

Lithospermum angustifolium Michx Fl. Bor.-Am. 1: 130 (1803).

Collected in fruit only, near Thedford, June 20 (No. 1389).

Lithospermum hirtum

The oldest name, I think, is Bartschia

Walter Fl. Car. 91)

carolinensis Gmelin, Syst. 1: 315 (1788); but Lithospermum carolinense can not very well be used as it is essentially the same as L. carolinianum, which has been used for Onosmodium carolinianum This is a true sandhill species, Thedford, June 15 (No. 1355).

X Onosmodium molle Michx Fl. Bor. Am 1: 133 (1803).

If this and O. carolinianum are to be united as one species, which they very likely should, O. molle is the older name and should be regarded as the type form. Thedford, June 20 (No. 1365).

Oenothera leptophylla Torr. Fl. Frem. Rep. 94 (1853)

On the prairies near Plummer Ford, July 8 (No. 1512).

X Cuscuta indecora pulcherrima Choi (Scheele) Eng. Trans. Acad. Sc. St Louis 1: no 3, 405 (1859); C. pulcherrima Scheele Linnaea 21: 502

1500 (1848)

The most common cuscuta in the region North east of Whitman, Aug 1, host plants: Helianthus petiolaris, Rumex venosus; South Dismal River, Aug 14, host: Helianthus petiolaris; Mullen, Sept 19, hosts: Cyclo-loma ~~platyphyllum~~ atriplicifolia, Chenopodium leptophyllum, Coriospermum hyssopifolium and Polygonum ramosissimum (No 1634). In a few specimens, the corolla is smaller and the plant approaches the true C. indecora: Mullen, Aug 17, hosts: Psoralea lanceolata and artemisia canadensis; Thedford, Aug 19, host: Lotus americanus (No. 1694).

___ Cuscuta coryli Eng am. Journ Sci. 43: 337 (1842).

___ Mora rara: South Dismal River, Aug 14, host. Salix sp.; Thedford, Aug 26, host. Aster sp. (No. 1688).

___ Cuscuta cuspidata Eng. Bost Journ Nat. Hist. Soc. 5: 224 (184-).

___ Collected only at one place, but there

covering more than an acre of ground, ½ miles North East of Whitman, aug 1, host: Ambrosia psilostachya (No. 1639).

+X Solanum nigrum Lin. Sp. Pl. 266 (1753). 186

The specimens from Mullen, July 20, are tall, hairy, with the younger parts subcanescent Those from Thedford, June 21, are greener and with thin leaves. (No. 1385).

X Solanum triflorum Nutt. Gen. N. A. Pl. 1:128 (1818).

The only places in which I have seen this plant grow is in "prairie-dog towns", Thedford, June 21, aug 19 (No. 1393).

Solanum rostratum Dunal Solan. 234, (1816).

Rare in the region. I collected only one specimen and Mr. Tulen only a few. Thedford, Sept 12 (No. 1758).

(?) Physalis virginiana Mill Dict Ed 8.

4: (1768). ?

Under this I place three diffent forms. I believe they are forms of one species, and very likely of the one named, but differ somewhat from forms growing in eastern Nebraska. The species of Physalis are not well understood and the genus need a revision. The first form is very low, only 1-1½ dm. high, very glandular with thickish cordate leaves. It is the form you would expect P. virginiana would received in such a locality as the Sandhills. Thedford, June 14, (No. 1787). The next form is similar to this, but the leaves more grayish, scarcely viscid. Brodyo Lake, aug. 11; Mullen July 23 (No. 1808). The third is taller, resembles more the true P. virginiana, but the leaves are villose and but little viscid. Plummer Ford, July 3. (No. 1479).

Physalis sp. virginiana Mill. Dict Ed 8: 4 (1768).

I have not attempted to name this plant. It resembles somewhat a tall form

~~a form of which~~ ~~is probably~~ but a form thereof due to the shaded locality in which it grows. It has of P. virginiana ~~but~~ however. very thin, large leave, not at all viscid, but with a stellate pubescens, mixt with long jointed hairs. ~~This~~ The ~~same~~ plant was collected by Smith and Pound in 1892 in Cherry Co. and a similar one, but with smaller leaves by myself on Scotts' Bluffs, Nebraska, in 1891. I named it Physalis mollis canescens which it resembles, in fact stands somewhat between this and P. virginiana. In the Nat. Herb., it has been placed ~~by~~ with P. viscosa, but I can not see any relation with ~~this~~ the plant named. Among bushes, Thedford, June 21 and Aug 22 (No 1398).

Physalis

This plant has been placed as a form of P. lanceolata, but I think it is distinct, at least as a good variety. I have not seen any inter mediate forms. Fully developed forms are easily to distinguish. This plant is more or less

decumbent, smooth except on the calyx and upper part of the stem which are furnished with a few long hairs, never ~~puinose~~ stellate; leaves obovate spatulate nearly always entire; fruiting calyx ~~ob~~ ob pyriform, scarcely angular and scarcely at all sunken at the base; berry yellow. ~~Ph~~ P. lanceolata, as I know it, is erect, generally stellate all over, leaves oval more or less ~~repand~~ sinuate; fruiting calyx strongly angled and deeply sunken at the base; berry redish. The younger plants are harder to distinguish, but as far as I know, P. lanceolata has never any hairs on the calyx. My plant has been named Ph. viscosa spatulata, to which it seems to be nearest related, but the leaves are not as thick and fleshy as in that variety. It is also nearly related to Ph. longifolia Nutt, which differs mainly in its tall upright habit and its longer leaves. Redford, June 16 South of Whitman, Aug 5; Mullen July 24.

(No. 1330).

Datura tatula Linn Sp. Pl. Ed. 2, 1: 256 (1753).

Escaped, near a hog pasture. Thedf. Aug 26 (No. 1727).

Pentstemon Haydenii Wats. Bot. Gaz. 16: 311 (1891).

Collected in fruit only, on one of the highest sandhills, Plummer Ford, July 6 (No. 1506).

Pentstemon caeruleus Nutt Gen N. A. Pl. 2: 52 (1818).

Sandhills, rare. Thedford, June 14-17, Mullen, July 19 (in fruit) (No. 1784).

Pentstemon albidus Nutt. Gen. N. A. Pl. 53 (1818).

Thedford, June 15 & 19; Mullen, July 19 (in fr.) (No 1316).

Mimulus glabratus jamesii (Torr & Gray)

Asa Gray, Syn. Fl. Supp. to Vol. 2, pt. 1, 447 (1886); M. jamesii Torr. & Gray in Db. Prod. 10: 371 (1844).

— — & In and near the Middle Loup River: Thedford, June 16; Mullen, July 17 (No 1331).

X Veronica americana (Schwein. Herb. Hook.) Db. Prod. 10: 468 (1846).

——— As preceding: Thedford, June 16 (No. 1332).

X Veronica peregrina Lin Sp. Pl. 1 (1753).

— In a prairie dog town near Thedford, June 15 (No. 1309

— Gerardia tenuifolia Vahl. Symb. 3: 79 (1794).

——— It may be G. erecta Walt Fl. Car. 170 (1778) which is an older name, but the identity is doubtful. West Cody's Lake, Aug 10; Mullen, Aug. 17; Thedford, Sept. 11; Plummer Bord, Aug 22 (No. 1671).

Castilleia sessilifolia Pursh, Fl. Am. Sept. 738 (1814).

Rara: Thedford, June 17; Norway, June 23 (no. 1342).

Anoplanthus fasciculatus (Nutt) Walp. Rep. 3: 480 (1845); Orobanche fasciculata Nutt. Gen. N. A. Pl. 2: 59 (1818).

Rara: Thedford, June 16 (No. 1323).

Utricularia vulgaris Lin Sp. Pl. 18 (1753).

Common in ponds near the rivers and in the lake region. Thedford, June 16 & 21, north east of Whitman, July 31 (No. 1358).

Verbena stricta Vent. Hort. Celo. 53 (1800)

Common: Norway, June 23; Dismal River, June 27; Forks of Dismal River, July 11; Mullen, July 18 (No 1422). Two miles north east of Whitman, we found a large patch, where every plant had white flowers.

Verbena hastata x *stricta* n. n.

This hybrid has been reported by Dr. Engelman and described in Am. Journ. Sc. 46: 100 (1844) under the name *V. paniculata* x *stricta*. On the banks of Middle Loup, north of Mullen, together with the preceding and the following, July 18 (No. 1564).

x *Verbena hastata* L. Sp. Pl. 20 (1753)

Forks of Dismal River, July 11; Mullen, July 18; Thedford, Sept 8 (No. 1515).

x *Verbena urticifolia* Lin Sp. Pl. 20 (1753).

Rare in the woods, near Pikenmer Ford, Aug 22 (No. 1716).

x *Verbena bracteosa* Michx Fl. Bor. am. 2: 13 (1803).

Dry prairie, Thedford, June 21 (No. 1306).

x *Phryma leptostachya* Lin. Sp. Pl. 601 (1753).

In damp woods: Forks of Dismal River, July 12; Forks of Middle Loup, July 26 (No. 1529).

Pleuricum occidentale Gray, Syn. Fl. N.A. 2 pt 1: 349 (1878).

Among bushes. Forks of Middle Loup River, July 27; & 15 miles south of Whitman, Aug 3; 3 miles north east of the same, July 31 (No. 1610).

X Mentha canadensis Lin. Spec. Pl. 577 (1753).

In wet places. North East of Whitman July 31; Cody's Lakes, Aug 11 (No. 1628).

X Lycopus virginicus L. Sp. Pl. 1: 21 (1753).

The leaves in my specimens are subsessile and the stem more acutish angled subcrulent. Among bushes near Thedford, Aug 17 (No. 1830). In open places the plant becoms much lower and more strict. Grant Co. Nebraska, Aug. 3; Cody's Lakes, Aug 9 (No. 1641).

Lycopus lucidus americanus Gray Proc. Am. Acad. 8: 286 (1873)

Prof. McMillan has changed this to *L. lucidus obtusifolius* from *L. obtusifolius* Benth. in DC. Prod. 12: 177 (1848), which, however, antedated by *L. obtusifolius* Vahl Enum. 1: 212 (1804).

✓ Lycopus lucidus obtusifolius (Benth.) McMill. Meth. Minn. Vall. 453 (1892); L. obtusifolius Benth. in DC. Prod. 12: 177 (1848).

Codyo. Lakes, Aug 10; South Dismal, Aug 14; Mullen, Aug 17 (No. 1658). A form of the same with inconspicuous bracts, which as well as the calyx lobes are slender and subulate, and with the perennial part of the root stock much swollen. Thedford, Aug 19 (1702).

+ Lycopus sinuatus Ell. Sk. Bot S. Car. & Ga. 1: 27 (1821).

Mullen, July 27; Codyo Lakes, Aug 9 (No. 1655).

✓ Hoellia lanceolata (Pursh) O. Kuntze Rev. Gen. 2: 520 (1891);

Banks of Middle Loup, Mullen, July 17; South Dismal, Aug 14 (No. 1560).

✓ Hedeoma hispida Pursh Fl. am. Sept. 2: 414 (1814).

Not common. Thedford, June 16 and 20 (No. 1312).

X Monarda fistulosa L. Sp. 22 (1753).
Forks of Dismal River, July 11; Mullen, July 17; Forks of Middle Loup, July 26 (No. 1531).

Monarda citriodora Cerv. Lag. Nov. Gen. & Spec. 2 (1816).
On dry prairies; Thedford, June 21; Dismal River, June 27 (No 1387).

X Prunella vulgaris Linn Sp. Pl. 600 (1753)
On moist hillsides: Thedford, June 21; Mullen, July 20 (No. 1347).

X Scutellaria galericulata Linn. Sp. Pl 599 (1753).
On the river banks and in wet meadows; ~~Thedford~~ Plummer Ford, July 3; Forks of Dismal River, July 11; North East of Whitman, July 31; Lodge Lakes, Aug.

11 (No. 1490).

x Scutellaria lateriflora Lin. Sp. Pl. 598 (1753).

River banks: South Dismal, aug 14; Thedford, Sept 9 (No. 1691).

Plantago patagonica gnaphalioides x (Nutt) Gray Syn. Fl. vol 2, pt. 1: 391 (1886); ✓ P. gnaphalioides Nutt Gen. 1: 100 (1818).

Prairie, Thedford, June 15 (No 1310). On very dry places, as for instance in prairiedog towns the plant becomes very delicate, less woolly, with oval, few flowered heads. Thedford, June 14 (No. 1294).

x Allionia hirsuta Pursh Fl. Am. Sept. 728 (1814).

Under this I place several different forms, of which may be one or two good varieties might be made; but as I have not seen these forms from other localities and as the seem to grade into each other it would not be advisable to separate them

out before better known.

1. The more typical form with lance-olate or oblong leaves and the stem little hairy except at the nodes. (A similar form but with still narrower, nearly linear lance-olate leaves I have collected in Western Nebraska and the Black Hills of South Dakota. Dismal River, near Plummer Ford, July 6-8; Forks of Middle Loup, July 27; Sand hills north east of Whitman, July 29; Mullen, July 18 (No. 1509).

2. A more stout form, hirsute all over; leaves ovate or oblong ovate. Plummer Ford, July 4; Mullen, July 19; Dismal River, June 27 (No. 1433).

3. A very stout form with purplish stem, hirsute all over and with broad leaves, the lower broadly ovate, obtuse. Forks of Middle Loup, July 27 (No. 1810.

4. A few specimens with very thick and fleshy leaves, hirsute, especially on the ribs; stem densely hirsute, panicle crowded Mullen, July 18 (No. 1799).

x Allionia nyctaginea Michx Fl Bor. am. 100 (1803).

Not common in the sandhill region. Plummer Ford, July 5; Mullen, July 20 (No. 1496).

Abronia fragrans Nutt. in Hook. Kew Journ. Bot. 5: 261 (1853).

Planted from seeds collected in the neighborhood, but I did not see any wild plant. Further west it is very common. Thedford June 19 (No. 1263).

x Amaranthus retroflexus Lin Sp. Pl. 991 (1753).

On an old field, Mullen, July 18, No 1795.

Amaranthus blitoides Wats Proc. am. x acad. 7: 273 (1878)

The stem is often more or less succulent. Thedford, June 21; Mullen, July 18 (No. 1291). No. 1695 is a form with smaller leaves and the peduncles more or less thickened, Road Mullen, July 19.

X — Amaranthus albus Lin. Sp. Pl. Ed. 2: 1404 (1762)

— In my specimens the seed are evidently not mature. Thedford, Aug 26; North East of Whitman, July 29 (No. 1614).

— tuberculata Moquin
— Acnida tamariscina (Nutt) Wood Bot. 289 (1874); Amaranthus tamariscinus Nutt ✓ Trans Am. Phil. Soc 5: 165 (1837).

The form common in Eastern Nebraska — with large thin leaves, lanceolate to oval, generally tapering at both ends, was growing on the lowlands Forks of Middle — Loup, July 29; North east of Whitman, Aug 1; West Codyo Lake, Aug 10 (No. 1674). At Plummer Ford, July 8 was found a similar — form, but with narrow oblong to lanceolate leaves thin, mucronate leaves, and the lower fertile flowers in small heads. Hooper (No. 1513). On the sandhills grew a form with smaller, thicker, more veiny, obovate to ovate, obtuse but mucronate leaves resembling much those of Amaranthus hibridus. Mathiek, June 20; Plummer Ford

~~July 8 (No 1370)~~. On the dry, alkaline lakes, west and north of Whitman, was found a low, branched form, with small leaves and reddish stem and flowers, July 31 and Sept 20 (No. 1778).

Froelichia floridana (Nutt) Moq. DC. Prod 13, pt 2: 420 (1849); Oplotheca floridana Nutt Gen N. A. Pl. 2: 79 (1818).

Mr. J. M. Holzinger has united this with F. gracilis. I think however that as I know it, they are distinct. In F. floridana, the wings of the fruiting calyx are erose dentate, not spiny except the lower tooth; in F. gracilis the teeth all become spiny. Mullen, July 24 (No 1524). On the sand hills near Plummer Ford, aug 21, I found giant form, 10-12 dm high, with in age nearly black bracts, and large leaves, some over 1 dm in length. (No 1838).

Cycloloma atriplicifolia (Spreng); Salsola atriplicifolia Spreng Nachtr. h. Hall.

1: 35 (1801); (Salsola platyphylla Mich. Fl. Bor Am 1: 174, 1803).

Mullen, July 24 17×24; Natick, Sept 11 (No. 1585).

Chenopodium leptophyllum (Nutt & Mog (Nutt (M.S.) Nutt (M.S.)
Watson Proc. Am. Acad. 9: 94 (1874); Ch. album leptophyllum (Nutt) Moq in DC. Prod 13, pt. 2: 71 (1849).

My specimens have at a little broader leaves than usually. Common, Thedford June 21; Mullen, July 18; Norway, June 22. (No. 1386).

No. 1835 is a form that deserves a varietal name as well as the next. It has lare, sometimes 5 cm. long and 2½ cm. wide, very thin, glabrate above and sometimes hastately lobed at the base. Mullen, July 17; Plummer Ford, Aug 22.

Chenopodium leptophyllum oblongifolium Wats. Proc. Am. Acad. 9: 95 (1874).

Dry soil, Mullen, July 24 (No. 1836).—

X *Chenopodium leptophyllum subglabrum* Wats. Proc. Am. Acad. 9: 95 (1874).

This may be is a distinct species. By the slender peduncles and, the distant flower and the smoth leaves it resembles somwhat Ch. ~~Bost~~ *Bosc*ianum. Norway, June 23; Thedford, June 17; Plummer Ford, July 3-6; Mullen, July 17 & 18 (No. 1351).

Chenopodium Fremontii Wats Kings

X Rep. 5: 287 (1871)

This is the same as ~~*Fremontii* Wats~~. No. 570 and 1734 of Wrights Collection, which constitute a part of the material on which Watson based this species. Watsons own specimens, No. 973 in Kings Report, however, are undeveloped specimens with very small leaves and to me seem to belong to a different species. Always growing in shade. Dismal River, June 29; Plummer

Ford, Aug 22; Whitman, Sept 20; ~~Heath~~ Some of the specimens from Plummer Ford are more mealy than usually. (No. 1450).

X Chenopodium Fremontii incanum Wats Proc. am. Acad. 9: 94 (1874).

Perhaps also a good species, only found in "prairie dog towns, as far as I know. Thedford, June 19 & 21, Sept 7 (No. 1394).

X Chenopodium album L. Sp. Pl. 219 (1753).

The common form was rare. Its place as a weed seems to be taken by Ch. leptophyllum Forks of Dismal River, June 11 (No. 1524). A form with thin leaves was collected near the Forks of Dismal River, July 13; Mullen July 17 (No 1542).

X Chenopodium hybridum Lin Sp. Pl. 219 (1753).

Not uncommon along Dismal River; Plummer Ford, Aug 22; Forks of Dismal

July 12 (No 1525).

× Chenopodium rubrum L Sp Pl. 218 (1753).

Swampy place near a lake, north west of Whitman, Sept 20 (No. 1791). An autumnal form was collected in a "dry" lake, west of Whitman, Sept 19 (No. 1782).

× Coriospermum hyssopifolium L. Sp Pl. 4 (1753).

Not uncommon, Mullen, July 17; Sept 16; Matick Mullen Sept 11 (No. 1647).

Salsola Kali Tragus (L) Coder. Fl. Dan 818 (1770). ? sec. Moquin in D.C. Prod. vol 13 pt 2 187 (1869); Salsola Kali Lin Sp Pl. ed 2. 322 (1762).

This weed is rapidly spreading through Nebraska. The railroads and especially the cattle cars, seems to be the principals means by which it is distributed. It had established itself along the railroad at Thedford, aug 28; less so at Mullen, July 24. & Sept 16, & found even a few specimens near Plummer

Ford, 15 miles from railroad, Aug 22 (No. 1593).

Sarcobatus vermiculatus

I saw this plant on the railroad bank west of Mullen, July 24, but no specimens were secured.

Eriogonum annuum Nutt Trans Am. Phil. Soc. 5: 164 ('1837')

On the sandhills, north east of Whitman July 31; Mullen, July 19 & 22; Codys Lakes, Aug 10; Natick, Sept 11 (No. 1580).

Rumex venosus Pursh Fl. Am. Sept. 733 (1814).

On the rail road banks near Redford, June 14 & 17 (No. 1288).

Rumex Britannica L. Sp Pl. 334 (1753).

Codys Lakes, Aug 10; Plummer Ford, Aug 22 (No. 1670) This has not been reported

for Nebraska.

× *Rumex persicarioides* L. Sp. Pl. 335 (1753).
Along the Middle Loup and in the wet valleys of Grant Co. Mullen, July 18; North East of Whitman, July 31; Cody's Lakes, Aug 10; Thedford, Aug 29 (No 1572).

Polygonum ? *aviculare* Linn Sp Pl 362 (1753).
Common throughout the region. Forks of Dismal River, July 12; Cody's Lakes, Aug 9; Thedford, Sept 7 (No 1535). A form, growing in shade, with very thin leaves may belong to this species. As no fruit were found, the identification is somewhat doubtful. Mullen Sept 15 (~~No 1772~~ No. 1772).

Polygonum littorale Link, in Schrad Journ. 1: 54 (1799)
Common along the rail road bank, near Mullen, July 17 & Sept 15 (No. 1771).

Polygonum campomum Meisner, in Martyn, Fl. Bras 5: 21 (1855).

This was found along the railroad at Thedford, Sept. 7; Mullen, Sept. 13 (No 1763).

Polygonum ramosissimum Michx Fl. Am. Bor. 1: 237 (1803).

The typical form was collected at Mullen, July 18 & Sept 16; Cody's Lakes, Aug 10 (No. 1579) A very slender form with apressed branches was collected in Grant County, Aug 4 (No. 1870). An other form with small leaves, resembling somewhat the preceding in appearance. Mullen Sept 14 (No 1769).

Polygonum ramosissimum patulum ?

~~This~~ It was thus named by Mr. Small I have not been able to find any description of this variety. These specimens look very different from those of the same variety in my Black Hills Collection, having very thin leaves, resembling somewhat those of P. erectum, but this may be explained by the fact that they were growing in ~~this~~ shade. Mullen, Sept. 14 (& No 1768).

✓ *Polygonum punctatum leptostachyum* (Meisn) Small, Bull. Torr. Bot. Club. 19: 356 (1892).

The style is often 2-parted and the achenes lenticular, smoth & shining. In some places the plants were simple, slender and scarcely rooting Mullen, Aug 17; Thedford, Sept 9; Forks of Middle Loup, July 26 (No. 1602). In others the plants were very much branched and the leaves larger West Cody's Lake, Aug 10 (No. 1672).

✓ *Polygonum lapatifolium* L. Sp. Pl. 360 (1753).

The more common form with stout stem and large leaves was collected in meadows: Mullen, July 17; Forks of Middle Loup, July 28; North east of Whitman, July 31 (No. 1571). No. 1629 is a form with smaller leaves. The dolole plant is also more yellowish. Grant County, July 31. No 1794 is another form with low stem, short and dense spikes and larger flowers. It was collected in dry lakes in Grant Co, Sept. 20 (No. 1794).

(*Polygonum persicarioides* H. B. K. No. Gen. II 2: 179 (1817) was collected by Herbert J. Webber at Thedford in 1889).

Polygonum Hartwrightii Gray. Proc. Am. Acad. Sc. 7: 294 (1870).

Two forms were found, one upright and more hairy, one low, procumbent and rooting in the mud. The first was collected at Swan Lake, Grant County, Aug 7 and North East of Whitman, July 29 (No. 1649); the other was found north west of Whitman, Sept 20 (No 1793).

Polygonum emersum (Michx) Trans. N. Y. Acad. Sc. 8: 73 (1889) ~~Small Bull. Torr. Bot. Club 19: 359 (1892)~~; P. amphibium emersum Michx. Fl. Am. 1: 240 (1803).

~~Most~~ More or less hairy, leaves even subcanescent below, upper part of the stem and ochrae strigose, peduncles strigose or glandular, bracts conspicuously strigose and ciliate. Dry lakes in Grant Co. July 29-31 (No. 1613). One specimen was found in Swan Lake, Aug 7, that had plainly ciliate ochrae and shorter spike, may be a hybride with preceding (No. 1822).

Polygonum amphibium Lin. Sp. Pl. 361 (1753).
I did not secure more than on specimen in Swan Lake, aug 7 (No 1653); but Miss M. P. Tullis collected several.

Polygonum

Polygonum sagittatum Lin Sp. Pl 363 (1753).
Common in wet meadows of Thomas County, Thedford, aug 19; Plummer Ford, aug 22 (No. 1708).

Polygonum scandens Lin. Sp. Pl. 364 (1753).
Common along South Decimal River, aug 11 (No. 1679).

Polygonum convolvulus Lin. Sp. Pl. 364 (1753).
Mullen, July 24; Forks of Decimal River, July 11 (~~&~~ No. 1521).

Fagopyrum ~~Fagopyrum~~ (L)

Polygonum fagopyrum L. Spe. Pl. ~~1032~~ 364 (1753).

Escaped, Mullen, July 18; Thedford, Aug 26 (~~1753~~) (No. 1567).

Comandra pallida A. DC. Prod 14: 636 (1857)

On the sandhills, Thedford, June 19 (No. 1363).

Euphorbia petaloidea Eng. Bot. U.S. & Mex. Boun. Surv. 185 (1859);

~~The leaves~~ In the common form, the leaves are about 2-3 cm long and 6 m.m. wide and the glands large. Thedford, June ~~20~~ Sept 7; Dismal River, June 27; Plummer Ford, July 3; Mullen July 27. (No. 1372). An autumnal form has narrower and shorter leaves and smaller glands, Thedford Sept 9 (No. 1744).

Euphorbia Geyeri Eng. Pl. Lindh. 1: ~~260~~ 59 (1845). in Bost Journ. N. H. Hist. V. 260. (1845)

In most of ~~my~~ the specimens, the seeds

are large, in form, size and color resembling those of E. petaloidea. ~~Common~~ In the sandhills: Plummer Ford, July 6; Cody's Lakes, aug 9; Natick, Sept 11 (No. 1504) On a few specimens, the seeds are much small, and also the leaves. Thedford, Sept 9 (No. 1753)

× Euphorbia serpyllifolia Pers. Syn Pl. v. Engh. Bot. 2:14 (1807).

Only a small ~~form~~ specimen collected on the R rail road bank near Mullen July 24. This seems to be nearest var. but the material to meagre to decide. (No 1833).

× Euphorbia glyptosperma Eng Bot. U.S. & Mex. Bound. Surv. 2:187 (1859).

Very variable. Some forms are prostrate, spreading, with broad leaves resembling those of E. Geyeri, except that they are slightly toothed near the apex. Thedford, June 21; Forks of Dismal River, July 27; Mullen, July 18; Forks of Loup, July 27 (No. 1373). An other form has narrow-

er, that is oblong leaves and ascending stem. Forks of Dismal, July 11; North East of Whitman, aug 4; Mullen, July 19 & Sept 16 (No. 1527). a third form, collected at Thedford, Sept 9, is upright, slender and has narrow leaves (No. 1742).

Euphorbia hexagona Nutt. in Sprengl. Syst 3: 791 (1829).

Sandhills, Mullen, July 17 & Sept 16 (No 1545).

Croton texensis (Klotzsch) Muller. DC. Prod 15: 692 (1866); Hedeandra texensis Klotzsch in Erichs. Arch. 1: 252 (1841).

Common in the sandhills. Thedford, June 17; Dismal River July 29; Plummer Ford, July 3; Forks of Dismal, July 12; Mullen, July 22 (No. 1430).

Ulmus americana Lin. Sp. Pl. 226 (1753)

Only the leaves were collected from a few trees growing on the South Dismal, July 13. Some of them were of the

common form with smooth twigs. (No. 1540). Others had the young twigs pubescent as in U. fulva, but otherwise agreeing with U. americana. (No. 1541).

× Celtis occidentalis Lin Sp. Pl. Ed. 2: 1478 (1762).

Here and there on the hillsides among the rivers and on the banks. Norway, June 23; Dismal River, June 27; Forks of Dismal River, July 11. At the last place, I found trees about ½ M in diameter.

H Humulus Lupulus. L. Sp. Pl. 1028 (1753).

Forks of Dismal River, July 13, but neither flowers, nor fruit seen. (No. 1539).

(?) Urtica dioica Lin. Sp. Pl. (1753)

A slender plant (no flowers) with thin broadly cordate leaves, which I take to be a form of U. dioica, although the leaves are not at all downy beneath. (No. 1790).

Urtica gracilis Ait. Hort. Kew. 1: 341 (1789).

Very variable. One form collected has narrow sharply serrate, short-petioled leaves, which are bristly along the veins and on the petioles, and short flower clusters. 20 miles south of Whitman, Aug 4; Plummer Ford, Aug 23 (No. 1821). Another form is like this except it has broader leaves, and longer petioles and peduncles. Mullen, July 17 (No. 1558). The third is the most common form with narrow leaves and slender peduncles. Plummer Ford, July 4 & Aug 22; Mullen Sept 16. (No. 1520).

Adicea pumila (Lin) Raf. Ann. Nat. 179 (1815). Urtica pumila L Sp. Pl. 984 (1753)

Mullen, July 27 & Aug 19; South Dismal, Aug 12; Thedford, ~~Aug 17~~ Sept 7; West of Whitman, Sept 19. (No. 1609).

+ Boemeria cylindrica (L) Willd. Sp. Pl 4: 340 (1805); Urtica cylindrica L. Sp. Pl.

984
~~1346~~ (1753).

Wet meadows among bushes, Halsey and Matick, Sept. 11 (No. 1745).

Paritaria pensylvanica Muhl. in Willd Sp. Pl 4: 955 (1805).

In shady places. Dismal River, June 29; Forks of Dismal, July 12; Mullen, July 26; Cody's Lakes, Aug 11. (No. 1473).

Salix fluviatilis Nutt Silva 73 (1842). along the streams common. Thedford, June 15; Norway, June 23; South Dismal, Aug 14; Mullen July 20. (No. 1315).
S. longifolia Muhl (4: 238 (1803) is antedated by S. longifolia Neu Sch., Gesell. Nat. Fr. Berl. (folia Lam. 6

Salix cordata Muhl N. Berl. Schr. 4: 238 (1803).

This is a common willow in Nebraska and has gone under that name, although it does not agree with the description in all respects. Plummer Ford, July 5 (No. 1498).

Salix cordata angustifolia (Pursh anders Monog Sal. 159 (1867).

Ceratophyllum demersum Lin. Sp. Pl. 992, 1753)
Sylvan Lake, aug 7 (No. 1823).

(Liparis Loeselii was collected by Mrs.
M. L. Tuley near Thedford).

collected in fruit only, but seem to agree fully with specimens collected and named by Mr. Bebb. Norway June 22 (No. 1412); Thedford, July 16; S. the Dismal Aug 12 (No. 1329).

Salix cordata vestita a. d. Monog. Sal. 159 (1867).

Neither fruit nor flowers seen. On the banks of Middle Loup, north of Mullen, July 19 (No. 1581).

Populus deltoides Marsh Arbust. Am. 106 (1785)
Populus monilifera Ait Hort Kew 3: 406 (1789).

Here and there on the hills, near the streams. Norway, June 22; Mullen, July 19 (No. 1411).

Habenaria hyperborea (Linn) R. Br. Hort Kew ed 2 5: 193 (1813); Ophrys hyperborea Linn. Mant. 1: 121 (1767).

On ~~meadows~~ (Thedford,) June 13 & 19, Sept 7; Forks of Dismal River, July 12 (No. 1297).

Ibidium cernua O. cernuum L 946 (1753)

Not very common in wet meadows; Plummer Ford, Aug 23; Thedford, Aug 26 (No. 1719).

* *Sisyrinchium bermudiana* Linn Sp. Pl. 954 (1753).

Prairies near Thedford, June 16 (No 1251).

* *Allium mutabile* Michx Fl. Bor. Am 1: 195 (1803).

Prairie: Thedford, June 15 (No 1290).

Polygonatum biflorum (Walt) Ell. Bot. S.C. & Ga 1: 393 (1817-24); *Convallaria biflora* Walt Fl. Car. 1788

A form approaching the next, from which it scarcely differs except in its smaller, sparsely amplexicaule leaves and two-flowered peduncles. Hillside about 800 meters above the bed of Dismal River, near Plummer Ford, July 5 (No. 1483)

Polygonatum biflorum commutatum (R. & S.) Morong, Bull Torr. Bot Club 5: 115 (1894); *Convallaria commutata* Roem & Schult. Syst. 7: 1671 (1830).

Hillside, Norway, June 22 (No. 1408).

Yucca glauca Nutt Trayers' Cat. (1813)
On the Sandhills. Thedford, June 19;
Plummer Ford, July 5 (No. 1339).

Smilax herbacea Lin. Sp. Pl. 1030 (1753)
Hillsides: Plummer Ford, July 3; Forks
of Middle Loup, July 26; Seneca Sept 16
(No 1455.)

Vagnera stellata (L.) Morong, Bull.

× Commelina stellata L. 316.

Among bushes, on the banks of Middle Loup, June 17 (No. 1[illegible]).

× Commelina virginica L. Sp. Pl. Ed. 2. 61 (1762).

— Not uncommon in the sandhills, Thedford, June 17; Dismal River, June 29 (No. 1345).

Tradescantia virginiana Linn. Sp. Pl. 288 (1753).

— In eastern Nebraska, this plant grows only on lowland, with alluvial soil, but here it grows from the top of the sandhills down into the valleys, but is most common in the first habitat. Thedford, June 18, &c. (No. 1380).

— Juncus balticus Willd. Litterarii Gaz. Journ. St Louis Acad. 2, 442 (1866).

Not common. The common form was found near Thedford, June 21 (No 1401).

A more slender form, with wiry stems, and more elongated clusters was collected near Natick, June 20 (No. 1376).

---

† Juncus tenuis Willd. ~~Species~~ Pl. 2: 214 (1799).

This plant is very variable, Even this collection displays a great variety of forms. Perhaps the most typical form was collected at Plummer Ford, July 4; Forks of Dismal River, July 11; North East of Whitman, Aug 1 (No. 1487) A taller form with broad sheaths and narrow, involute or channeled leaves, and spals longer than the pod and panicle dense and many flowered, at Mullen, July 26; Natick, June 20 (No. 1374). A slender form of greener color, and open panicle at Natick, June 20; Plummer Ford, July 3 (No. 1374). A similar form, but with very slender, ~~pedicels~~ semi-1-flowered pedicels and tread like leaves; Plummer Ford, June 3. No. 1318 is a unusually low form. Bluedford, June 16; North East of Whitman, Aug 1, and No. 1841 a

similar, but greener and more tufted. Mullen, July 18; ~~Madison~~, Sept 9 (No 1841).

+ Juncus nodosus Linn Sp. Pl. Ed 2: 466 (1762)

Common. Norway, June 22; Natick, June 20; Forks of Dismal River, July 12; Thedford Aug 26. (1369). All these specimens are low. Only on the Dismal River, June 27, I found tall (4-6 dm) more slender specimens. (No 1441).

✓ Juncus nodosus megacephalus Torr Fl. N. Y. 2: 326 (1843)

The most common form in Nebraska, having a few crowded heads, was collected south of Whitman Aug 4 (No. 1817). A form with many heads in a compound panicle and therefore resembling J. scirpoides echinatus was found at Mullen, July 18 (No. 1575).

✓ Juncus marginatus. Rostk Mon. June. 38 (180).

This is comparatively rare in Nebraska

It was collected near Cody's Lakes, Aug 9. (No 1827).

+ Typha latifolia Lin Sp. Pl. 971 (1753) River bank, Norway 22 (No. 1425).

V. Sparganium eurycarpum Engl in Gray, Man Ed 2: 430 (1856). River Bank; Rhedford, June 16; Mullen, July 17 (No. 1339).

V Lemna minor Lin. Spec. Pl. 970 (1753). Common in pool along the rivers, and in the Lakes of Grant Co. Rhedford, June 14, &c. (No. 1757).

Lemna perpusilla Torr. Fl. N. Y. II: 245 (1843)

I took this for L. valdiviniana Phil. as the fronds are more or less elongated and I could not see more than one nerve. Comparing it with the specimens in the National Herbarium, persuaded me that it must be L. perpusilla. L. valdiviniana

has much narrower and thicker fronds. In a spring near Plummer Ford, Aug 22. (No. 1733) This is new to the state of Nebraska.

Lemna trisulca Lin Sp. Pl. ~~970~~ 970 (1753)
Common in pools and lakes throughout Redford, June 21; West of Whitman, Sept 19 (No. 1397).

Lemna gibba Lin. Sp. Pl. 970 (1753).
The specimens collected are much smaller ~~than the European~~ than the specimens in the National Herbarium, which however are all European. The lower surface of the leaves are also of a darker color. In pools near Dismal River, Plummer Ford, July 5 (no. 1503). Also new to Nebraska.

Spirodela polyrrhiza (L.) Schleid. Linnaea 13: 392 (1839). Lemna polyrhiza L. Sp. Pl. ~~970~~ 970 (1753).
Rare in pools with Lemna minor, June 14 (No. 1258).

† Alisma Plantago Lin. Sp. Pl. 342 (1753).
In dry lakes, north east of Whitman, July 29-31 (No. 1616).

or † Sagittaria latifolia Willd. Sp Pl. 4: 408 (1806)
The typical form was growing in the edge of the streams and Lakes, Mullen, July 17 (No 1563).
The form with narrower lobes, which has been called var. angustifolia was growing in deeper water, ~~bay~~ outside of ~~the~~ the typical form, Mullen, July 17 (No 1562)
Another form (marked form C. by Jarrd G. Smith) with smaller (about ½ the size) leaves than the typical was growing on the sandy banks of the rivers, Forks of the Dismal, July 12 (No. 1533). No 1812 is a diminutive form of the same. ~~Mullen, July~~ Forks of Middle Loup, July 27.

Sagittaria arifolia J. G. Smith. n. sp.
This has been named by Mr. Jarrd G.

Smith, who has been preparing a monograph of the Genus. I have not seen his diagnosis. I do not want to make any ~~publication~~ description of the species, as I understand, the monograph is with the printer, and probably will be out before this goes to print. One character which first called my attention was the bracts, which are lanceolate and much longer than in S. latifolia. In streams. Forks of Middle Loup, July 26; South Dismal, Aug 14 (No. 1809). No. 1811 is a form with thinner nearly membranaceous leaves and shorter lobes. Forks of Middle Loup, July 27.

* Triglochin maritima L. Sp. Pl. 339 (1753).

In meadows near Medford, June 14 (No. 1280).

* Potamogeton natans L. Sp. Pl. 126 (1753).

In Lakes in Grant Co. Swan Lake,

Aug 7; North west of Whitman, Sept 19 (No. 1652).

Potamogeton lonchites Tuck. Am. Journ. Sc. (new ser) 6:226 (1848).

Near to the typical form but with smaller leaves. Norway, June 23 (No. 1421)

Another form, I also refer here, which, however, differs somewhat in the form of the leaves. The floating ones are narrow and thin, and with only 9-13 nerves. Dismal River, June 26 (No. 1846).

Potamogeton amplifolius Tuckerm. Am Journ. Sc. (new ser) 6:225 (1848).

Common. Dismal River, June 26; Swan Lake, Aug 7; North west of Whitman, Sept 19 (No. 1440).

Potamogeton perfoliatus Linn Sp. Pl. 126 (1753).

This plant approaches the var. Richardsonii Ar Bennet. Journ. Bot. 27: 25 (1889). In a lake north west of Whitman, Sept. 20 (No. 1792)

+ Potamogeton pusillus Lin. Sp. Pl. 127 (1753).
In a pool, near Middle Loup, Thed. ford, June 21 (No. 1396).

X Potamogeton pectinatus L Sp Pl. 127 (1753).
East Cody's Lake, Aug 9; Lake north west of Whitman, Sept 19 (No 1659). The specimens from the latter locality are of the form that had been called var. scoparius Walt.

? Potamogeton interruptus Kitaibel in Schultes, Oest. Fl. Ed 2. 328 (1814).
With some doubt I place it under this species. I have no mature fruit, but the long, broad leaves with strong transverse veins suggest that it must belong to this species rather than to P. pectinatus. To one of the two it belongs. (No. 1439).

X Zannichellia palustris Lin Sp Pl. 969 (1753).

A small form, ~~only a few cm~~ less than a dm. high, rooting in the ~~mud~~ sand, East Codyo Lake, Aug 9–10 (No 1661).

Najas flexilis (Willd) Rand. & Smith Fl. Sed 384 (1824) Caulinia flexilis Willd Abh. akad. Berl. 95 (1803)

Only a few specimens collected in East Codyo Lake, Aug 9 (No. 1660). a more slender form, in appearance resembling more the next but with broader, ovate fruit, not reticulated. At the other shore of the same lake, Aug 11 (No. 1828).

Najas guadalupensis (Spreng) Morong Mem. Torr. Bot. Club. Vol. 3, No. 2: 60 (1893); Caulinia guadalupensis Spreng. Syst. 1: 20 (1825)

In a lake, north west of Whitman, Sept 19 (1786). a rare plant in this latitude. It was collected for the first time in Nebraska by Prof Thos A. Williams. in 18 .

Cyperus Schweinitzii Torr. Mon. N. Am Cyp. in Ann. Lyc. Nat. Hist. N. Y. 3: 276 (1836)

A very common plant in the sand-hills. (Norway, June 23; Plummer Ford, July 8; Thedford, June 20; Mullen, July 19; North East of Witman, July 31 (No. 1371).

Cyperus Houghtonii Torr. l.c. pg. 277 (1836) (1883) A ~~comparatively~~ rare plant, that for some time has been lost to science. It has been held not to be distinct from preceding, from which it can easily be distinguished by its less sharp angles of the culm, which are not scabrous and by its not cuspidate glumes. (My specimens agree fully with Torrey's description, except that the leaves are a little rough on the margin. Old field, near Natick, Sept 11 (No. 1747).

Cyperus strigosus Lin. Sp. Pl. 47 (1753). A common plant on moist sandy soil. Cody's Lakes, Aug 9; Thedford, Aug. 26 (No. 1654).

Cyperus diandrus Torr. Cat. N. Y. 90

(1819).

An unusually low and caespitose form, growing on the sandy banks of the rivers. Plummer Ford, aug 22; Thedford, aug 26 (No 1718).

Cyperus aristatus Rottb. Descr. 23 (1773)

Near a dried up pool in the sandhills, Mullen, July 28 (No. 1599).

Eleocharis palustris (L) R & S Syst Veg. 2: 151 (1817); Scirpus palustris Lin. Sp. Pl. 47 (1753).

More typical forms were collected at Dismal River, June 29; Plummer Ford, July 4; Cody's Lakes, aug 7 (No. 1485). A lower more slender form with more obovate achenes with a short tubercle. Thedford, June 14-20 (No. 1265).

Eleocharis ~~palustris~~ glaucescens (Willd) Gray Man Ed 5: 558 (1867); Scirpus glaucescens Willd Enum. 76 (1809)

Dismal River, June 27; Plummer Ford, July 3; Forks of Dismal River, July 11; Natick, June 19 (No. 1436).

Eleocharis acicularis (L) Roem. & Sch. Syst. Veg 2:154 (1817); Scirpus acicularis Linn. Sp Pl. 47 (1753).

On the specimens from Nebraska the spikes are lighter in color than usually. Thedford, June 17, 20; Dismal River, June 27; Plummer Ford, July 3; North west of Whitman, Sept 20 (No. 1436).

Fimbristylis castanea (Michx) Vahl, Enum. 2:292 1806; Scirpus castaneus Michx. Fl. Bor. Am. 1:31 (1803); Schoenus umbellatus Walt. Fl. Car. 70 (1788).

On a meadow near Thedford, Aug 29 (No. 1712). Nebraska specimens are slender, with heads of thin bright brown scales.

Scirpus americanus Pers. Syn. & Encl. Bot. 1:68 (1805).

Common in Nebraska, Thedford, June 15; Plummer Ford, July 4 (No. 1319).

Scirpus lacustris Lin. Sp. Pl. 48 (1753).

On Middle Loup River, Thedford, June 14, 16 (No. 1276).

X Scirpus lacustris occidentalis Wats. Bot. Cal. 2: 218 (1880).

I think this is the first time this western plant has been collected east of the Rocky Mountains. In Middle Loup, Redford, June 21; Mullen, July 19 (No. 1388).

X Scirpus atrovirens pallidus Britt Trans N.Y. ac. Sc. Vol. 9, No 1: 164 (1889).

Dismal River, June 27; at the Forks, July 11; (No. 1427).

V Scirpus fluviatilis (Torr.) A. Gray Man. Ed 1: 527 (1848). S. smithii Fluv. Torr. Ann. Lyc. N.Y. 3: 324 (1836)

Rare, in a dry lake, north east of Whitman, July 29 (No. 1612).

Eriophorum gracile Koch in Roth. Cat. 2. 259 (1800).

Collected in a swamp near Dismal River, June 28 (No. 1446).

X Carex pseudo-cyperus Linn Sp. Pl. 978 (1753).

This is perhaps the var. americana Boeckl.

Asa. Herb. Unio Stan (1837). Not collected before in Nebraska. Swamp, 20 miles south of Whitman, aug 4 (No. 1646).

Carex hystricina Muhl. Willd Sp Pl 4: f 282 (1805).

common, Thedford, June 14; Dismal River, June 27. (No. 1277).

Carex trichocarpa aristata (R. Br) Bailey Bot. Gaz. 10: 294 (1885); Carex aristata. Frank Jour 75: (1827)

a tall plant growing in swampy places. Forks of Middle Loup, July 29; 20 miles south of Whitman, aug 4 (No 1622).

Carex filiformis lanuginosa (Michx) B.S.P. Cat. N. Y. in Mem. Torr. Bot. Club. 63. (1888)

Carex lanuginosa Michx Fl. Bor. Am. 2: 175 (1803)

Together with preceding south of Whitman, aug 4. (No. 1816). a lower more strict and more leafy form was collected at Thedford, June 14 (No 1766). Nearly all the specimens of the latter lacked the staminate

spike

Carex vulgaris Fries Mant. 3:155.

I place it with doubt with this species. It agrees well with this plant, but the achenes are deciduous, which should place it with C. decidua Boot. It resembles also somewhat C. interrupta, but the place where it was found it is out of the range of both. Norway, June 22 (No. 1797).

Carex nebraskensis Dewey, Sill Journ Sci Bot. 18:102 (about 1854).

Common around Thedford, June 14; Mullen, July 17 (No. 1264).

Carex laxiflora varians Bailey. Mem. Torr. Bot Club. 1:32 (1889)

Only 3 specimens secured at Plummer Ford, July 3 (No. 1461). The staminate spikes are small and subsessile.

Carex aurea Nutt Gen. N.A. Pl. 2:205 (1818)

Common, Thedford, June 16 (No. 1296)

Ench. Meth. 182

Carex pensylvanica Lam. ~~Dict d. Bot.~~ 3: 388 (1789).

On the prairies, but comparatively rare in the region. Thedford, June 20 (No 1382).

Carex stenophylla Wahl Kong. acad. nya Handl II 24: 142 (1803) ~~et Act. Holm. 142 (1801)~~.

On the prairies near Thedford, June 14 (No. 1254).

Carex longirostris Tor. ~~&~~ Schwein. Ann. ~~Fab~~ E. & G. 1: 7 (1824).

In woods, near Plummer Ford, July 3 (No. 1478).

Carex teretiuscula Good. Trans. Lin Soc. 2: 163 (1794).

On the meadows, near Thedford, June 21 (No 1399).

Carex marcida Boott. Hook. Fl. Bor. Am. 2: 212 (1840).

The typical form with narrow, at ma-

turity nearly black perigynia was collected at Mullen, July 24 (No. 1805). Another form with greenish brown (not mature) perigynia with broader wings, I refer also here; Thedford, June 16 (No. 1317); and also a similar form, but more slender and with more open spikes, Thedford, June 14 (No. 1274).

Carex Douglasii Boott in Hook Fl. Bor. Am 2: 213 (1840).

Prairie, Thedford, June 14 (No. 1215).

Carex interior Bailey Bull. Torr. Bot Club. 20: 426 (1893).

It is new to the State of Nebraska, but rather common in the Sand hill region. Thedford, June 14, 16 (No 1261).

x Carex stipitata Muhl in Willd. Sp. Pl. 4: 233 (1805).

Not common, Thedford, June 16; Dunner Ford, July 3 (No. 1298).

Carex scoparia Schkuhr Riedg. Nachtr. 20. (1806).

Rare. Only a few specimens secured. Thedford, June 14 (No. 1768).

Carex straminea Willd Schkuhr Riedgr 49 (1801)

This was collected by Mr. Pollen, near Thedford. (No specimen in my collection.

Paspalum setaceum ciliatifolium (Michx) Vasey Cont. U. S. Nat. Herb. Vol 3. No. 1: 17 (1892); P. ciliatifolium Michx Fl. Bor. am. 1: 44 (1803).

The specimens in the collection are lighter colored and with larger flowers than usually. The leaves are ciliate with long silky hairs from small warts.

Beckmannia eruciformis uniflora Scribner. Vasey. Desc. Cat

Found only in one wet meadow north

East of Whitman, July 29 (No. 1624).

✓ Spartina cynosuroides (Lin) Willd Enum. 1: 80 (1809); Dactylis cynosuroides Lin. Sp. Pl. 71 (1753).

Common near water. Mullen, July 18; north East of Whitman, July 29 (No. 1577).

+ Panicum capillare Lin Sp Pl ~~86~~ 58 (1753).

Very large specimens were collected in and old field near the Forks of Dismal River, June 13 (No. 1538).

Another form was collected in a dry lake west of Whitman, Sept. 19 (No. 1788). In this the leaves are narrower and as well as the sheath less hairy. Stem more slender and branches from the root; spikelets as well as the fertile flowers acute. It seems to agree with var. agreste Gatting. Penn Flora 94 (1887), but the spikelets are much larger and more pointed. This

form is named var. *occidentalis* in the National Herbarium but no description is published as far as I know.

Panicum virgatum Linn Sp. Pl. ~~87~~ 59 (1753).

The leaves are more or less hairy on the upper side, ~~of the leaves, except~~ especially just above the ligule. In more rich soil, it grows to 6–10 dm. high and has an open panicle Mullen, July 17; Forks of Middle Loup, July 26; Grant County, July 29 (No. 1561). On the sandhills it is lower (3–5 dm), more glaucous and with shorter and denser panicle. Mullen, July 24; South Dismal, Aug. 14 (No. 1597). One of the best hay grasses.

✓ *Panicum scoparium* Lam. Enc. 4 744 (1797).

In the region this was lower than usually in Nebraska. Thed ford June 14 (No 1797). In some localities, they were very low, only 1–1½ dm high,

with crowded leaves and small, panicles partly included in the sheath. Dismal River, June 29. (No. 1493). A similar form has also very narrow, linear lanceolate leaves. ~~This~~ Specimens of this form are placed with P. Wilcoxianum in the National Herbarium, but I think they rather should be placed with P. scoparium. Mullen, July 24 (No. 1604).

Panicum Wilcoxianum Vasey ~~Bull. U. S. Dep. Agr. Div. Bot. 3~~ (1893) ~~Contr. U. S. Nat. Herb. Vol 3, No. 1: 31~~ (1892).

This can best be described by the statement that it has the leaves of P. depauperatum, but the panicle and flowers of P. scoparium. ~~Natick June 20 (No. 1368).~~ Thedford, June 16, 19 (No. 1308).

X Panicum dichotomum Lin. Sp. Pl. 58 (1753) ~~Mich. Fl. Bor. Am.~~ barbulatum ~~(Michx) Gray Man. Ed. 5~~; P. barbulatum ~~Michx Fl. Bor. Am. 1: 49 (1803)~~.

Wet meadow, ~~June~~ Natick, June 20 (No. 1368).

x *Panicum crus-galli* Lin. Sp. Pl. 56 (1753).

Two forms of this was collected: one, a prostrate form, probably introduced, in a road, north of Mullen, July 24 (No. 1590); the other a tall erect, glaucous form, undoubtedly native in a wet meadow, 15 miles south of Whitman, Aug 4, and west of the same place, Sept 19 (No. 1643).

x *Chamaeraphis viridis* (L). Porter in Bur Torr. Bot Club. 20: 196 (1893). *Panicum* ✓ *viride* Lin Sp. Pl. Ed 2: 83 (1762).

Old field, Mullen, July 18 (No. 1568).

x *Cenchrus tribuloides* Lin Sp Pl. 1050 (1753).

Strangely but true, that the "sand-bur was not common in the sandhills (Mullen, July 17 (No. 1548).

Homalocenchrus oryzoides (Lin) ✓ Poll. Nest Pl. Palat. 1: 52 (1776); *Thalaris*

oryzoides (Lin. Sp. Pl. 55 (1753).
Wet meadows in Grant County, Aug 4; Sept 20 (No. 1644).

---

† Zizania aquatica Lin Sp. Pl. 991 (1753),
Swamps north East of Whitman, July 31; South thereof, Aug 2 (No. 1630).

Andropogon Hallii Hackel in Sitz. Ak. Wiss. Wien 89: 1: 127 (1884)

Stem glaucous, perfectly smooth up to the spikes; joints of the rachis and pedicels villose of long white hairs, axons none or short and mostly straight. This form seems to approach var muticus Hackel. Mullen, July 24, North East of Whitman, July 29 (No. 1595). This plant is generally to coarse to be used for hay.

125
Andropogon Hallii f laevelus Hackel l.c.
Like the last, but the hairs of the rachis yellow. Coda'jo Lakes, Aug 7-9; Mullen, July 24 (No. 1802).

Andropogon Hallii Hackel l. c. (forms)

This species is extremely variable, and if those varieties named by Hackel are good varieties, at least as many more could be added. ~~One~~ In one form the rachis and pedicels are nearly destitute of hairs and the spikes therefore receive a very different appearence, Forks of Middle Loup, July 27; North east of Whitman, July 31 (No. 1607). On a hillside near Dismal river, June 27 ~~(No. 1449)~~, a very low and slender form, with ~~x~~short spikes, was found. This bloomed a month earlier. Nearly all the spikes were infested with smut. (No. 1449).

All these forms were found on the Sandhills, A. Hallii being a sandhill plant. Further down on the ~~sand~~ hillsides and in the dryer part of the valleys, I found forms that grade into the next. In fact, it is sometimes impossible to tell to which ~~it~~ they belong. They may be hybrids, but I rather think that A. Hallii

and *provincialis* are only the different forms of a very variable species. In most of these forms of these plants, the size and habitus are between the two, so also the color and of the stem and leaves. The size, hairiness &c. of the rachis and spikelets are those of *A. Hallii*, but the awns and the hairiness of the upper side of the leaves above the ligules, those of *A. provincialis*. Mullen, July 24; Whitman, July 31 (No 1596). No. 1813 are forms that rather should be placed with thex next, from which they only differ in larger, more clustered spikes, a coarser stem and somewhat glaucous leaves, Whitman together with preceding form. A

✓ *Andropogon provincialis* Lam. Enc. Meth. 1: 376 (1783).

The typical form with slender more or less purplish stem and spikes, bluish green leaves, which are generally hairy on the upper surface, just above the ligules.

slender spikes and twisted and bent awns, which are much longer than the glumes, grows nearly without exception on low moist soil. Wet valley north east of Whitman, July 29-31. This and Panicum virgatum and A. nutans avenaceum are the principal hay grasses in Grant Co.

---

x Andropogon scoparius Michx Fl. Bor Am. 1: 57 (1803).

Specimens from the sandhills are always tufted, with flat sheaths, glaucous and with joints of the spikes more hairy than usually. This is common on the sandhills but regarded as a worthless grass. Cody's Lakes, Aug 9; South Dismal, Aug 14; (No. 1665).

Andropogon nutans avenaceum (Michx) Hackel DC. Mon. Phan. 6: 530, 1889; Andropogon avenaceum Michx Fl. Bor. Am. 1: 58 (1803).

This is common in the low lands and is one of the best hay grasses. Grant County Aug 1, 4 & 10; South Dismal River

Aug 14 (No. 1638).

✓ *Phalaris arundinacea* Lin Sp. Pl. 55 (1753)

All the specimens collected have an unusually narrow panicles, may be a distinct form. North west of Whitman in a wet meadow, July 29 (No. 1621).

Aristida fasciculata Torr. Ann. Lyc. N. Y. 1: 15-11 146 (1824).

A low and slender form with very long awns. On a dry hill, near Thedford, June 15 & Sept 8 (No. 1300).

Aristida basiramea Eng Bot Jour. 9: 76 (1884).

The specimens in the collection were collected by Mr. C. C. Wright, and given to me. The specimens are low, with lateral awns 4 lines long. Thedford (date not known. No. 1847).

Stipa spartea Trin Act. Petr. 1: 440 (1830). Mem. Acad. Petr. 1: 351 (1838)

Sandhills, Thedford June 19. (No. 1402).

✓ Stipa comata, Trin. & Rup. Stipaceae 75 (1842). Mem. Acad. St. Pet. VI, 5: 75 (1842)

Sandhills, Mullen, July 17; Dismal River, June 27; Norway, June 23; Thedford, June 17 (No 1344). This and the preceding are said to make good hay if cut early.

Stipa viridula ~~Trin~~ Trin Mem. Acad. St. Pete. Act. Pet. 1: 39 (~~1826~~). (VI) 2: 39 (1838).

Rare, only a few specimens in poor condition secured. Mullen, July 24 (No. 1598).

Oryzopsis micrantha (Trin & Rup) Thurb. ~~Bot Cal. 2~~ Proc. Acad. Phil. 78 (1863). Urachne micrantha Trin. & Rup. Mem. Stipae. VI 5: 16 (1842). 16 (1842).

In shady places, mostly in woods. Plummer Ford, July 3; Mullen, July 19; (No. 1482).

Oryzopsis membranacea Vasey Grasses S. W. Pt 2: t 10 (1891) Stipa membranacea Pursh

Fl. am. Sept. 2: 728 (1814).

In a canon, near Middle Loup, north of Mullen, July 17 (No. 1550).

Alopecurus geniculatus Lin arisulatus (Michx) Munro in Torr. Fl. N.S. 1: 97 (1824); Alopecurus aristulatus Michx Fl. Bor-Am. 43 (1803).

Near the river at Plummer Ford, July 4 (no. 1488). It is regarded as a good pasture grass but was rare here and hence of little importance.

Muhlenbergia pungens Thurb. Proc. Phil. Acad. 78 (1863).

This is one of the blowout grasses, growing in the driest sandhills, generally in or near a blowout. Mullen, July 17 & 19, Sept 24; Cody's Lakes, Aug 9; Thedford, Sept 9 (No. 1551).

X Muhlenbergia racemosa (Michx) B.S.P. 2nd Cat. N. Y. 67 (1888); Agrostis racemosa Michx. Fl. Bor. Am. 1: 53 (1803).

Two forms were collected. One is a strict, slender form, with the flowering glumes cuspidate, and palets 3/4 the length of the glumes. Meadows: Mullen, Aug 17; Thedford, Aug 19 (No. 1709). The other is branching near the base. The outer glumes with the awns 1/2 longer than the acute, but not pointed flowering glumes and palet, which are equal in length; hairs at the base of the flowers nearly 1/2 the length of the flower. Thedford, Sept 13 (No. 1762). One of the best hay grasses.

Muhlenbergia mexicana (Lin) Trin Mem. Acad. Petersb. 189 (1828); Agrostis mexicana Lin. Mant. 31 (1767).

Of this species there is at least two distinct forms, one growing in the meadows and the other in woods. The first one may be regardid as the typical one, as it agrees best with the description in Lin. Mant. It is nearly upright, resembling M. racemosa in habit but more slender and with a narrower spike. On a meadow

on South Dismal filling a space of a couple acres of ground, and would make good hay. Aug 12 (No. 1686). a more slender form was collected at Malick, Sept 11 (No. 1756) and a similar, but shortleafed and purple form at Thedford, Sept 13 (No. 1764).

The other form, which may be deserves a varietal name is more of the habit of M. Silvatica from which it differs mainly in the lack of the awn. The plant is slender, postrate with broader leaves and a more branched and open panicle. In mine the flowering glumes are scarious except the green nerves. Among high bushes, near the river. Thedford, Aug 19. (No 1704).

Sporobalus cryptandrus (Torr) Gray Man. Ed 2: 576 (1856); Agrostis cryptandra Torr. Ann. Lyc. N. Y. 1: 151 (1824).

The most common form in Nebraska, with included or less included spikes was collected at Mullen, July 24 & Aug 17; Codijo Lakes, Aug.

9. (No. 1697).
another form with exserted, purplish panicle, with reflexed branches, was collected on the bank of Middle Loup, Thedford, Aug 19 (No. 1705).

Sporobulus cryptandrus robustus Vasey Cont. Nat. Herb. Vol. 1: 56 (1890).
On the sandhills, Mullen July 17 & 24; Cody's Lakes, Aug 10 (No 1549).

Sporobulus gracillimus (Thurber) Scribner; Vilfa gracillima Thurber Bot. Cal. 2: 268 (1880).
This western species has, as far as I know, has not before been collected east of Utah and Montana It was found abundantly around a spring, 2 miles west of Thedford, Sept 9 (No. 1744). The specimens are taller than those from the mountains. Stems often ~~4-6~~ 2 dm long, but slender more or less decumbent. A few specimens were found ½ mile further down the river, Sept 7 (No. 1759)

These have larger spikes, nearly as large as S. cuspidatus, from which they are easily distinguished by the short outer glumes and the annual roots.

Sporobulus asperifolius (Nees & Meyer) Thurber. Bot Cal. 2: 269 (1880); Vilfa asperifolia Nees & Meyer in Trin. Agrosti. 73 (1840).

In wet meadows, Cody's Lakes, Aug 17; Mullen, Aug 17; Thedford, Sept 8 (No 1657).

Agrostis alba Lin Sp. Pl. 63 (1753).

A light colored slender form growing in shade. ~~Forks~~ South Dismal River, July 13 (No. 1546).

Agrostis exarata Trin. Sc. Gram. 3: 97 (1828).

~~The~~ A more typical form was found near Plummer Ford July 3 (No. 1842); a more slender one with narrow spikelike panicle at Mullen, July 17 (No. 1800); a third, robust form with larger panicle and broad (up

to 6 to 7 mm broad) leaves. Plummer Ford, July 4 (No. 1492).

Agrostis hiemalis (Walt) B.S.P. Bd. Cat N. U. 68 (1888); Cornucopiae hiemalis Walt. Fl. Car. 74 (1788).

Dismal River, July 27; Plummer Ford, July 4; Mullen, July 19 (No. 1438).

& Agrostis altissima laxa Tuckerm. Am. Journal. Sc. 45: 44 (1843).

There are no specimens under this name in the National Herbarium ~~under this name~~ and it is with doubt I refer it to this variety. It has been named A. hiemalis or scabra which is the same, but it differs in the ~~head~~ more robust and strict stem, the larger panicle, broader flat leaves (3-4 mm. wide) and larger flowers. It differs from specimens of A. elata which is the same as A. altissima in the National Herbarium in the very long branches of the panicle. Plummer Ford, July 4

(No. 1489).

Calamovilfa longifolia (Hook) Hack ~~Hook. Fl. Bor.~~ ~~Am. 2: 241 (1840)~~. Calamagrostis longifolia. Hook. Fl. Bor. Am. 2: 241 (1840).

Common on the sandhills, throughout; Mullen, July 22; North east of Whitman, July 31 (No. 1804).

Calamagrostis canadensis (Michx) Beau. Agrost. 15 (1812); Arundo canadensis Michx. Fl. ~~Bor.~~ Bor. Am. 1: 73 (1803)

A slender form with looser panicle and broader less acuminate outer glumes. Whitman, July 29 (No. 1620).

Calamagrostis robusta Vasey

Very variable. In some the panicle is nearly spikely. Dismal River June 27, (No. 1426), Norway, June 22; Mullen, July 17 (No. 1494). ~~In~~ The latter are more leafy, with narrow leaves. Some forms have more open panicle, as

those from Plummer Ford, July 4 (No. 1494). In a few specimens from Mullen, July 17 (No. 1557), the panicle is large, dense and the leaves broad.

Schedonardus paniculatus (Nutt) Coville T. L. Ark 236 (1891); Lepturus paniculatus Nutt Gen. 1: 81 (1818)

Rare, on sandy soil: Thedford, Aug 19 (No. 1710).

~~Bouteloua hirsuta (H. B. K.) Steudner~~

~~Bouteloua hirsuta Lag. Var. Cien. y Lit (1805) 2: p. 4. 141 (1803).~~

Not common: Mullen, July 17, 18; Cody's Lakes, Aug 10 (No. 1552).

Bouteloua oligostachya (Nutt) Torr in Gray Man Ed 2: 553 (1856) 671 (1868); Atheropogon oligostachyum Nutt Gen N. A. Pl. 1: 78 (1818).

Rare: Plummer Ford, Aug 23; Mullen, July 19 (No 1574). No 1803 is a low form with a few glandular warts on the outer glumes, which caracterizes B. hirsuta. Mullen, July 24. This and the preceding constitute the winter pasturage of Western Nebraska. In the fall they become cured and make a good pasture for the cattle.

Bouteloua curtipendula (Michx) Torr ~~Gramm. Bep 155 (1868)~~ ~~Man. Ed 5: 681 (1868)~~; Chloris curtipendula Michx Fl. Bor. Am. 1: 59 (1803).

Not common: Plummer Ford, July 5; Forks of Dismal River, July 13. (No. 1499).

Bulbilis dactyloides (Nutt) Raf. Am. Month. Mag. 4: 119 (1819); Sesleria dactyloides, Nutt. Gen. 1: 65 (1818).

Not very common in the region. otherwise regarded as a good pasture grass, especially for winter pasturing. This species is often monoecious, although more often dioecious. Prairie: Thedford, June 14; Norway, June 23 (No. 1253).

Sieglingia purpurea (Walt) Kuntze Rev. Gen Plant. 2: 789 (1891); Aira purpurea Walt. Fl. Car. 78 (1788)

On sandy soil, most in on the river banks. Mullen, Aug 17; Thedford, Aug 14; Plummer Ford, Aug 22; Ft Kick, Sept 11 (No. 1698).

Leptochloa fascicularis (Lam.) Gray Man. Ed. 1. 588 (1848); Festuca fascicularis Lam. ~~Thedford Aug 21~~ Encycl. 1. 189. (1791).

Thed sandy prairies, local: Thedford, aug 21 (No. 1713).

Phragmites phragmites (Linn.) Karst. Deutsch. Fl. 379 (1880-83) Arundo phragmites Linn Sp. Pl. 81 (1753).

On or near water. Plummer Ford, aug 22; Lakes in Grant County, July 31. (No 1631).

Koeleria cristata (L.) Pers. Syn. R. v. Ench. Bot. 1:97 (1805); Aira cristata Linn. Sp. Pl. 63 (1753).

Wherever it grows more abundantly it is an important factor ~~in the early to~~ in making up the pasturage in early spring. Thedford, June 14; Mullen, July 19 (No. 1273).

Koeleria nitida Nutt. Gen. N. A.

Pl. 74 (1818).

Prof. Lamson-Scribner holds this as a distinct species. As he at present is the authority on grasses in this country, I follow him. Otherwise it has generally been regarded as a variety of the preceding.

Thedford, Sept. 9 (No. 1844).

✓ Eatonia obtusata (Michx) Gray, Man. Ed. 5: 626 (1868); Aira obtusata Michx ✓Fl. Bor.-Am. 1: 62 (1803).

On the dry prairies also an early pasture grass. Plummer Ford, July 4 (No. 1486).

Eatonia obtusata robusta Vasey

This grows on wet places, generally near the rivers, and blooms later than the species. Mullen, July 17 (No 1807)

✓ Munroa squarrosa (Nutt) Torr ~~Bot. Whipple Exp.~~ Pac. R R Rep. 4, 158 (1856); [illegible]

sq arrosa Elliott Jour 1:47 (1818

Rare in the region. Norway, June 23; Forks of Dismal River, July 12 (No. 1534).

Calabrosa aquatica (L.) Beauv. Agr. 19 ( ); Aira aquatica Lin. Sp. Pl. 64 (1753).

In springs, Thedford, June 17; Plummer's Island, July 3 (No. 1381).

— Eragrostis major, Host. Gram. 4: 14 (1809).

The common low, nearly prostrate form was found in roads and old fields. Mullen, July 20 & Sept 17; Thedford, Sept 7 (No. 1588) Another form, nearly upright and with many broad leaves was found in fields Forks of Dismal River, July 11; Natick, Sept 7 (No. 1522).

— Eragrostis caroliniana (Sprengl) Scribner 49; Poa caroli-

Z1-Nat. 07

niana Sprang. Mant. 1: 33 (1828).

This has been confused with E. pilosa, from which it is very hard to distinguish it. Perhaps only a western form of that species. Rail Road Bank, Malden, Sept 15 (No. 1774).

Eragrostis tenuis (Ell). Gray. Man. Ed. 2: 564 (1868); Poa tenuis Ell. Sk. Bot. S. Car. & Ga 1: 156 (1871)

This is one of the "blow-out" grasses, growing on the drier sandhills. It is one of the most common plants in the region, and is very variable, probably depending upon the conditions in which it grows. A form with strict, elongated panicle, with many large spikelets, I take as the typical form. This has broad leaves, about 4 mm. wide, and conspicuous tufts of hairs at the mouth of the sheath. Cody's Lakes, Aug 10 (No. 1879). Another form with large spread-

ing panicle and long involute leaves was collected at Thedford, Sept 13; Plummer Ford, aug 22 (No. 1831). A third form was like the typical, except it was much smaller, with a small, compactly few flowered panicle, Plummer Ford, aug 23 (No. 1832). Near Mullen, July 18, I found a form with few-flowered panicle, with mostly 1-3, probably abortive, flowers (No. 1569).

Eragrostis pectinacea (Michx) Steudel. Syn Plant. Gram. 272 (1855); Poa pectinacea Michx. Fl. Am. I: 69 (1803).

A really ornamental grass with its large panicle of spikelets of a brilliant red color. Thedford, aug 19; Plummer Ford, aug 23-26 (No. 1711).

Poa arida Vasey Cont. U. S. Nat. Herb. Vol 1. No 8. 270 (1893).

Three forms of this species, neither of which is typical. The first differs from the type, in

being lower, and in having a smaller and narrower panicle (No. 1270). The second differs by its larger and heavier spikelets, its stouter habit, its narrow crowded spike panicle and the flowering glumes, which are more hairy (No. 1266). The third is like the second, but has a more open panicle (No. 1271). The last two forms, specimens collected in Nebraska by Corbett (preserved in the Herbarium of the University of Nebraska) and specimens collected by Prof. T. A. Williams in South Dakota (one sheet preserved in the National Herbarium) deserve, in my opinion, to be regarded as a good variety. All three forms were collected in meadows, near Thedford, June 14.

Poa pratensis Lin. Sp. Pl. 67 (1753).

Two distinct forms of this were collected. One resembles the common

form cultivated for lawns, but has smaller spikelets. Prairie, Thedford, June 14 (No. 1575). The other is a tall form, which look much different from the ~~origin~~ ordinary one. The panicle is denser, the branches less spreading, spikelets large, and the empty glumes scabrous on the margin, and the leaves longer and broader. Meadows, Thedford, June 14; Plummer Ford, July 4 (No. 1278).

? Poa Fendleriana (Steudel) Vasey Cont. U. S. Nat. Herb. Vol. 1, No. 8; (1893); ~~Eragrostis~~ Festuca Fendleriana Steudel Syn. Plant. Gram. 278 (1855).

~~It resembles some~~ Evidently dioecious The spikelets resembles somewhat this species, especially the steril ones. The fertile ones are more plump and green, with only a narrow ~~scarious~~ scarious portion of the glumes scarious, glumes hairy even between the nerves. The panicle is more spreading than in the typical P. Fendleriana, and the leaves long (dm) and broad

Redfieldia flexuosa (Thurber) Vasey Bull. Torr. Bot. Club. 14, 1887); *Graphephorum flexuosum* Thurber, Proc. Acad Phila 78 (1863).

A blow-out grass, growing in the very dryest and loosest sand. Near Middle Loup, north of Mullen, July 19; Rail-road bank, east thereof, July 10 and Aug 17 (No. 1583).

(3-5 mm.).

Rare, Thedford, June 14 (No. 1272). New to the state of Nebraska.

Distichlis spicata stricta (Thurber) [illegible]

pg 5! (1894), [illegible] Ann. Lyc. N.Y. [illegible] 1823

Distichlis maritima stricta Thurber Bot. Cal. 2: 306 (1880)

On sandy soil, near water. North east of Whitman, July 29; Cody's Lakes, Aug 9 (No. 1814).

Scolochloa festucacea (Willd.) Link Hort. Berol. I: 137 (1827); *Arundo festucacea* Willd. Enum. 1: 126 (1809).

This rare plant was collected in a lake, north west of ~~Thedford~~ Whitman, Sept 20 (No. 1795). It is new to Nebraska.

Panicularia nervata (Willd.) O. Kuntze. Rev. Gen. Pl. 2: 783 (1891); *Poa nervata* Willd. Sp. Pl. 1: 389 (1797).

The Nebraska forms of this species are much more slender, and with

X. aquatica (L.) O.K. *Rev. Gen. Pl.* 782 (1891)

Pra aquatica L. *Sp. Pl.* 67 (1753)

a more or less drooping panicle of small spikelets. Thedford, June 14; Dismal River June 27; Plummer Ford, July 3 (No. 1269). No. 1400 is a taller form with more spreading panicle, but not as robust as the species grows in the East. Thedford, June 21; Plummer Ford, July 4.

✓ Panicularia americana (Torr) Mc. Mill. Melt. Min. Valley, 81 (1822); Poa aquatica americana Torr. Fl. U. S. 1: 108 (1824).

On the rivers. Plummer Ford, July 3; Mullen, July 18 (No. 1459).

Festuca octoflora Walt. Fl. Car. 81 (1788).

Dry soil. a worthless little grass. Thedford, June 14 (No. 1282).

Bromus Kalmii Porteri Coulter Man. Rock. Mount. Reg. 425 (1885)

I can not find any authentic

specimen of this in the National Herbarium. ~~It~~ My specimens are like the eastern B. Kalmii, except that they are seldom hairy on the sheaths. They agree well with the description in Coulters Manual. Meadows, Mullen, Aug 19; Thedford, Sept 13 (No 1775).

Bromus ciliatus L. Sp. Pl. 76 (1753).

Meadows: Mullen, July 19; Plummer Ford, July 3; Forks of Dismal River, July 12 (No. 1404).

Agropyrum repens glaucum (Desf.) Smith. Mem. Torr Bot. Club. vol 5. 57. (1804(6mo)); Triticum glaucum Desf. Tabl. Bot Hist. 16 (1804)

Common throughout the region in the drier parts of the valleys. Plummers Ford, July 3; Dismal River, June 27. On an old haystack, north east of Whitman, Aug 1, a form was found with broad flat leaves. These specimens approach the true A. repens (No. 1434). On rich soil, the spikelets

often becom large and double, Thedford June 16; Plummer Ford, July 3 (No 1796).

? Agropyrum violaceum majus Vasey Cont. Nat. Herb. 1: 280 (1893).

Very similar to A. tenerum, but culms 10-12 dm high; spike 15-25 cm long of numerous spikelets, which are larger and more crowded than in A. tenerum; glumes strongly veined, the empty ones often purplish tinged and generally shorter than the spikelet; glumes mucronate or short awned; joints of the spikelet pilose. This latter character may not be constant but I have found it in all Nebraska specimens, viz from 3 localities in the summer 1893 and from Scott's Bluff in 1891 and also in Mr Herbert Webber's specimens from Thedford, 1859. These latter specimens were sent to Dr. Vasey for identification. They were named A. unilaterale Vasey & scrivner. Dr. Vasey has afterwards transferred them in the National Herbarium from A. unilaterale to A. violaceum majus. The type

~~The~~ specimens of this variety seem to be tufted as in A. tenerum and not spreading by a creeping root stock as in the Nebraska specimens. The hairiness of the joints of the spikelet is also lacking; otherwise very similar. Valley, Grant County, July 29 & 31. Also seen at Mullen and Bedford (No. 1619).

Agropyrum tenerum Vasey Bot. Gaz. 10: 258 (1885).

Rare, Dismal River, July 11 (No. 1516).

Agropyrum caninum ~~(L.)~~ unilaterale (Cassidy) Vasey Cont. U. S. Nat. Herb., Vol 1, 279 (1893); A. unilaterale Cassidy Bull. Col. Agr. Exp. Sta. Col. 12: 63 (1890)

In wet meadows, ~~July~~ north east of Whitman, July 29 (No. 1617).

Elymus macounii Vasey. Torr. Bull. Torr. Bot. Club. 13. 119 (1886)

I think this may be included in agropyrum. Perhaps Elymus and agropyrum

should ~~not~~ be ~~two~~ made one genus, as there is no character, that will absolutely distinguish the Two. Meadow in Grant County, July 29 (No. 1625).

Elymus striatus Willd. Sp. Pl. 470 (1797)
In shady places: Plummer Ford, July 3 (No. 1476).

Elymus canadensis L. Sp. Pl. 83 (1753)
The more typical form, was collected at the Forks of Dismal River, July 13 (No. 1443). Another form with narrow, involute leaves and smaller spikes was growing on the hills. Plummer Ford, July 13; Mullen, July 17; Middle Loup, July 26. (No. 147). On a damp place at the foot of a sandhill, ~~the~~ near Middle Loup, Hooker County, July 27, a few specimens of a form was found, which had spikes up to 2 – 3 d long and leaves 10 – 12 mm. wide. (No. 1806).

Elymus ~~canadensis~~ virginicus ~~virginicus~~ intermedius

It resembles this variety in every respect, except the lower glumes are those of E. virginicus rather than of E. canadensis. In fact it is intermediate between the variety, under which it is placed here, and a form of E. virginicus named var minor by Dr. Vasey but without description. Ravv, Mullen July 17 (No 1553).

Hordeum pusillum Nutt Gen. 1: 87 (1818).

I took this for H. nodosum L. but Mr. Dewey of the U.S Dep. Ag. has pointed out a good and easy character by which to distinguish the two. In H. nodosum, the outer glumes are narrow, gradually acuminating upwards; in H. pusillum they widen from a narrow base and then abruptly acuminates into an awn. Prairies: Thedford, June 14 (No. 1267).

Hordeum jubatum Lin. Sp. Pl. 85 (1753).
This worthless grass was only collected near Natick, June 20. ( )

Juniperus virginiana L. Sp. Pl. 1039 (1753).
Along Dismal River. Appearantly, it has been rather common, but most of the trees are cut down. Plummer Ford, July 3; Dismal River June 27. (No. 1428).

Azalea carolinana Willd Sp. Pl. 5: 541. (1810).
This interesting little plant was found in pools near a spring at Plummer Ford, Aug 24, growing together with Lemna minor and perpusilla. (No. 1728).

Botrychium virginianum (L) sw. in Schradero Journ. 2: 111 (1800); Osmunda virginiana Lin. Sp. Pl. 1064 (1753).
In woods, Plummer Ford, July 3; Forks of Dismal River, July 31 (No 1467).

Onoclea sensibilis Lin. Sp. Pl. 1062 (1753).

~~It was first collected in fruit [from last year] at Natick, June 20; but afterwards~~

Natick, June 20; Plummer Ford, Aug 23 (No. 1377). Common among bushes along the rivers.

Dryopteris Thelypteris (L) Gray, Man. Ed. 1: 630 (1848); Acrostichum Thelypteris Lin. Sp. Pl. 1071 (1753).

Common throughout in meadows; Halsey, Sept 11; South Dismal, Aug 12-14 (No. 1684).

Dryopteris spinulosa (Swartz) O. Kuntze Rev. Gen. Pl. 2: 810 (1891); Aspidium Spinulosum Swartz. in Schraders Journ. 2: 38 (1800)

Rare; Plummer Ford, July 4 (No. 1484).

Dryopteris cristata (Lin) Gray Man. Ed 1: 631 (1848); Polypodium cristatum Lin. Sp. Pl. 1090 (1753).

In damp places among the shrubs on the bank of Dismal River. at the Forks, July 12; South Dismal, Aug 14 (No 1530). Mews

to this state of Nebraska.

Cystopteris fragilis (Linn) Bernh. in Schrader's New Journ d d. Bot 1: pt. 2: 27 (1806); Polypodium fragile Linn Sp. Pl 1091 (1753).
On the wooded banks of Dismal River, Plummer Ford, July 3 (No 1452)

Woodsia oregana Eaton

On the wooded hillsides near Plummer Ford, July 5 (No.).

Equisetum arvense Linn. Sp Pl. 1061 (1753)
Only the sterile fronds collected at Natick, June 20; Thedford, Sept 9 (No 1378)

Equisetum variegatum Weber & Mohr Beitrh z Cryptf. Flor. 447 (1807).
On the banks of Middle Loup River north of Mullen, July 17 (No. 1801).

Equisetum [illegible] A Br Flora.

Journ. Sc. 46: 87 (1843).

— Two forms of this are found in Nebraska. The more common one corresponds to the description given in the manuals, except that it is often branched at the base as the preceding. The spikes are narrow and often somewhat stalked. Thedford June 14 (No. 1260). The other form is nearly equaling E. robustum in size, 6–10 dm high, ridges with 2 lines of tubercles, sheath 8–10 mm. long widening upwards, with a black margin and sometimes with a slightly brownish shade at the base. In meadows, Thedford, June 14 (No. 1263). This is said to be a good "haygrass" by stockmen.

Equisetum robustum A. Br. Am. Journ. Sc. 46: 88 (1843).

On a hillside near Plummer Pond, Aug 24 (No 1722).